WORLDCAST SYSTEMS

POWERFUL PERFORMANCE CONTROL SAVINGS SERVICES

ECRESO FM 100 W
ECRESO FM 300 W
ECRESO FM 750 W
ECRESO FM 1000 W
ECRESO FM 1500 W
ECRESO FM 2000 W
USER MANUAL

87.5 – 108 MHz

FM TRANSMITTER

Date: 2021/07/13

Version: 1.9.x

WorldCast Systems

web: www.worldcastsystems.com **- e-mail:** contact@worldcastsystems.com

WorldCast Systems, hereby, certifies that **ECRESO FM** transmitters comply with the dispositions of applicable European Community Directives.

A copy of the complete certificates of conformance can be found on the website www.worldcastsystems.com.

FCC Part 15.19 Warning Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Part 15.21 Warning Statement

NOTE: the grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user's authority to operate the equipment.

FCC Part 15.105(b) Warning Statement

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- -Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- -Consult the dealer or an experienced radio/TV technician for help.

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1. INTRODUCTION

1.1. About WorldCast Systems

WorldCast Systems is a leading solution provider with over 60 years of experience in media and broadcast.

Our solutions and services cover the entire broadcast chain from field contribution, to audio/video distribution over IP, FM transmission, RDS encoding, signal measurement, telemetry, antenna management, and remote monitoring and control.

With our established brands APT, Ecreso, Audemat, and the NMS solution KYBIO Media, we are trusted by customers worldwide including large network operators, regulation authorities, national broadcasters and local, community stations. From product and software supply to full turnkey solutions, we accompany our customers throughout all phases of their project.

Our team's mission - to help our customers deliver the best service to their audience, while lowering total cost of ownership and benefiting from the best user experience.

WorldCast Systems is a part of WorldCast Group and employs around 100 people worldwide. With its headquarters in Bordeaux, France, and offices in Miami and Kuala Lumpur, the group generates more than 85% of its turnover internationally. Customers also benefit local support through a large network of trusted partners and distributors.

Our In-House Expertise covers:

- Research & Development
- Production & Quality Testing
- Systems Integration
- Turnkey Projects
- Project Engineering & Customer Support
- Training Academy
- Maintenance & Technical Support

Why We're Here

We believe in bringing the most advanced solutions to our customers, enabling them to deliver to their audience continuous on-air broadcasting of information, music, radio, tv... while at work, on the road, at home.

- **Keep Your Audience Loyal** by delivering them a great experience with content that is delivered continuously and with the highest quality.
- **Reduce Your Operating Costs** with broadcast solutions that are competitive at the time of purchase and that continue to drive savings throughout our products' lifespan.
- **Protect Your Investment** with tools that enable optimum operating conditions of your network infrastructure and maximum site performance

What We Value

- **360° Innovation**
  - Collegial Management
  - Design Thinking
  - Future-Ready Designs
  - Agile Method
- **Enhancing The Customer Experience**
  - Great User Experience

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  - Simplicity
  - Product and Service Excellence
  - Quality ISO 9001
- **Sustainable Growth**
  - Product Efficiency
  - Low Consumption Building
  - Charitable Foundation For Local Reforestation

1.2. Before you start

1.2.1. Safety precautions

This equipment complies with international mechanical and electrical standards. To maintain this compliance, as well as to ensure proper and safe working conditions and avoid electrical shocks and fire hazards, you must comply with the following recommendations:

- The device should only be utilized in the conditions described in the user manual.
- The device is designed for industrial usage and must only be operated by qualified personnel.
- The device may be heavy; it must be lifted and handled with care, specifically during unpacking and set up.
- Rackable products must be set in cabinet with 19” rack mounting screws.

Electrical precautions

- Disconnect all sources of power before any intervention.
- Any maintenance, adjustment or repair must be carried out by personnel specifically trained by WorldCast Systems.
- Before switching on the device, make sure the nominal voltage specified on the device matches the mains nominal voltage.
- The device should only be operated on a stable electrical network. If the electrical network is not stable, a power conditioner, such as a UPS, must be used
- The device must only be used with a plug that incorporates a protective ground contact.
- To avoid any risk of electrocution, the protective earthing conductor must not be cut, intentionally or accidentally, either on the device or on the power cord.
- High quality shielded cables are mandatory.

Environmental precautions

- It is necessary to verify that environmental conditions comply with those recommended in the manual.
- Nothing must obstruct the ventilation.
- To avoid any electromagnetic interference, the device must only be used when it is closed, installed in a cabinet and connected to the earth as per the instructions.
- The device should not be exposed to dripping or splashing and no objects filled with liquids, such as coffee cups, should be placed on the equipment.
- Connectors may be hot on high power units.

Precautions regarding the lithium battery

This device includes a lithium battery.

If the battery is not correctly replaced, there is a risk of explosion.

- Only replace it with a battery of the same type. Contact us before attempting to use another type
- Do not puncture the battery
- Do not throw the battery in fire

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- Do not immerse the battery in water

Beryllium is present in the load and transistor used inside the unit.

- It can be handled safely if unbroken and undamaged, but dust from broken, crushed, or scratched beryllium can cause severe illness. Never cut or file beryllium.
- If broken beryllium is found, collect all particles carefully, being careful not to touch or breathe it. Package and dispose of it properly, then wash thoroughly.

Perchlorate material – special handling may apply, see https://dtsc.ca.gov/perchlorate/

Do not throw away used components containing hazardous material, recycle them instead. You may send it back to us if needed.

1.2.2. Factory guarantee

WorldCast Systems offers a standard three-year warranty on parts and workmanship from the date the transmitter is received. WorldCast Systems also offers on compact transmitters of the range a ten-year warranty.

If precautions listed section 1.2.1 are not followed, the guarantee will be void.

Using multiple captors, a µSD card records operating conditions which allow a precise and quick diagnostic for after sale services. If missing or if recorded readings show proper operating conditions have not been respected, the factory guarantee will be void, whether standard or extended depending on the contract subscribed by the client.

In case the client uses the µSD card for the optional audio backup or to retrieve saved configurations;

- the EMR directory must never be erased
- The µSD card must be quickly placed back in its reader. Absence of readings lasting over one week will lead to the guarantee being void.
- No other µSD card can be used.
- In case of destruction of the µSD card, contact the support service as soon as possible.

! ***Please refer to section 5.15 if you need to remove the µSD card.***

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2. DESCRIPTION

2.1. General description

Combining the very latest technologies with our proven RF experience, our FM transmitters have been designed to offer an innovative and highly reliable solution.

Among the first FM transmitters based on 6th Generation MOSFET, these transmitters are not only more robust, they also deliver efficiency of up to 76%. Top signal quality and performance are achieved thanks to the "FM Band Direct to Frequency" digital modulator which is at the heart of this range.

The manufacturing quality and the simplicity of use make these truly powerful transmitters to broadcast analog FM programs.

Ecreso FM transmitters are fully protected against overheating, VSWR and lightning.

They also offers a number of built in functions that can eliminate the additional cost and space requirements of external equipment.

Fully featured for local maintenance and configuration, they also allow full remote control by Web server, SNMP, RS232 or GPIOs (depending on options).

Options available with the current version are:

- **Communication Pack:** this software pack includes:
    - TCP/IP Connectivity
    - Web Interface for control and monitoring
    - Advanced Measurement Interface (AMI)
    - Scheduler
    - Alarm notification by email
    - SNMP management
    - Audio Backup on µSD card
    - Telnet connection
    - Preset management
- **SmartFM**: developed over 3 years of intense research, this option makes it possible to reduce FM Operating Costs (Opex) and CO_2 emissions
- **5-band Sound Processor**, which includes:
    - Single digital processing from audio to RF (direct to frequency)
    - Low Latency and Powerful DSP based algorithms
    - Gated and predictive automatic gain control
    - Equalization, Bass and Treble Enhancers
    - Stereo Enhancer and Limiter
    - 5 Band Processors
    - 5 Band Limiters
    - HF and Final Limiters
    - Complete set of audio presets
    - Intuitive and complete user interface with settings and vu meters (web based)
    - Easy fine tuning of your sonic signature

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- **Dynamic RDS**: the internal RDS encoder makes it possible to manage RDS parameters (PI, PS, TP, TA, PTY, MS, DI, RT, PTYN, AF, CT) and includes 1 PSN and 2 DSN.
- **SFN**: this option includes a 10 MHz input to synchronize the RF sub-carrier to an external source and an embedded memory on the digital modulator to configure the delays which will allow to the synchronization between the various transmitters.
- **10 MHz input for SFN application**: this option for SFN networks includes a 10 MHz input to synchronize the RF sub-carrier.
- **GPIO**: this additional board allows remote control and management of your transmitter. Available as standard or analog board.
- **Surge protector**: added to the chassis to limit the surge caused by lightning

Please refer to Appendix A for more information on option management.

Project co-financed by the European Union, involved in the Aquitaine Area, through the European Funds for local development.

2.2. Accessories

The ECRESO FM is supplied with:

- 1 power cable with locking system
- 1 serial cable
- 10 AT fuses for ECRESO FM 100W to 1000W
- 1 interlock plug + locks
- 1 ground strap
- 1 quick start notice.

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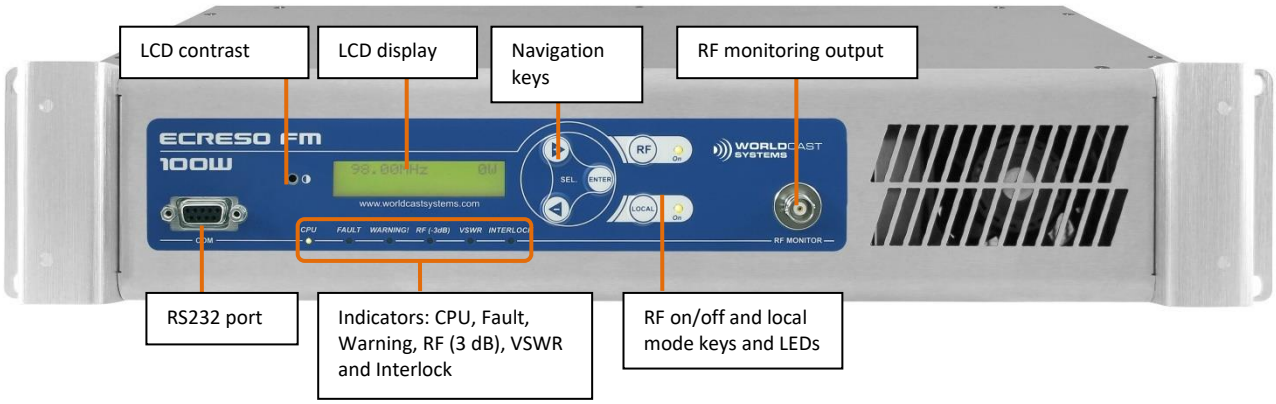
2.3. ECRESO FM Description

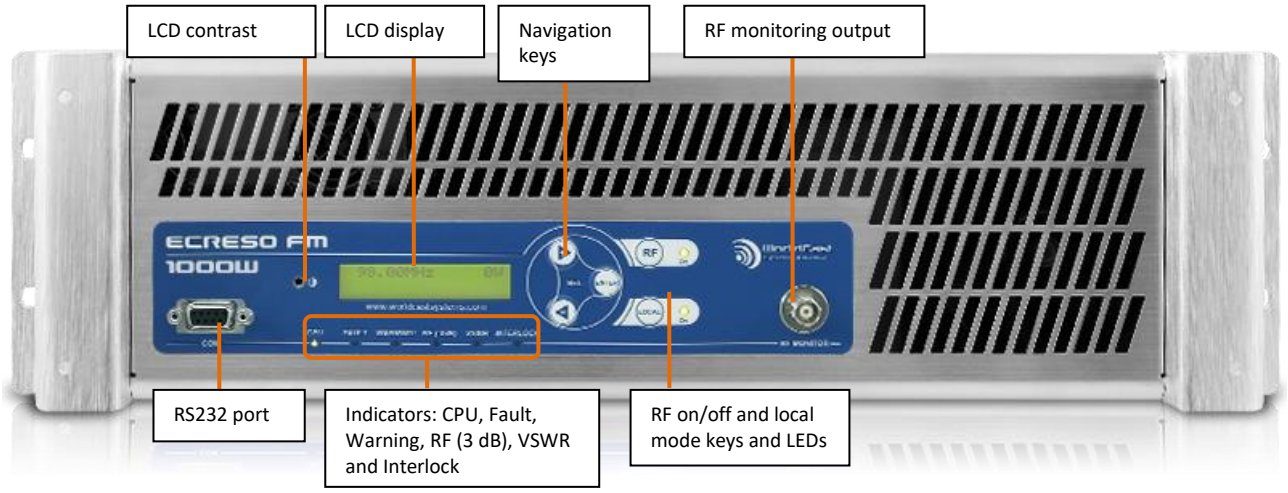
For optimum protection against corrosion, the Ecreso FM chassis is made of aluminum.

2.3.1. Front panel

ECRESO FM 100W / 300W



ECRESO FM 750 W - 2000 W



Description of indicator LEDs:

As a rule, green LEDs indicate things are ok, orange LEDs indicate an issue requiring attention, red LEDs indicate a possible loss of transmission.

- CPU: blinks to indicate CPU activity
- FAULT: major fault of the unit (3 dB, VSWR or audio fault)
- WARNING: minor fault of the unit (ambient temperature, heatsink temperature, PSU temperature, fan, current, voltage, 1 dB, loss of signal, battery low on startup).
- VSWR: VSWR of the unit

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- RF (3dB) : 3 dB of the unit
- INTERLOCK: indicates that internal or external safety links are not activated

- RF: indicates that the unit is on RF=ON. Associated to the RF button
- LOCAL: indicates that the unit is in local mode. Associated to the Local button

The transmitter is working properly when: the CPU LED blinks, and both the RF LED and the interlock LED are green

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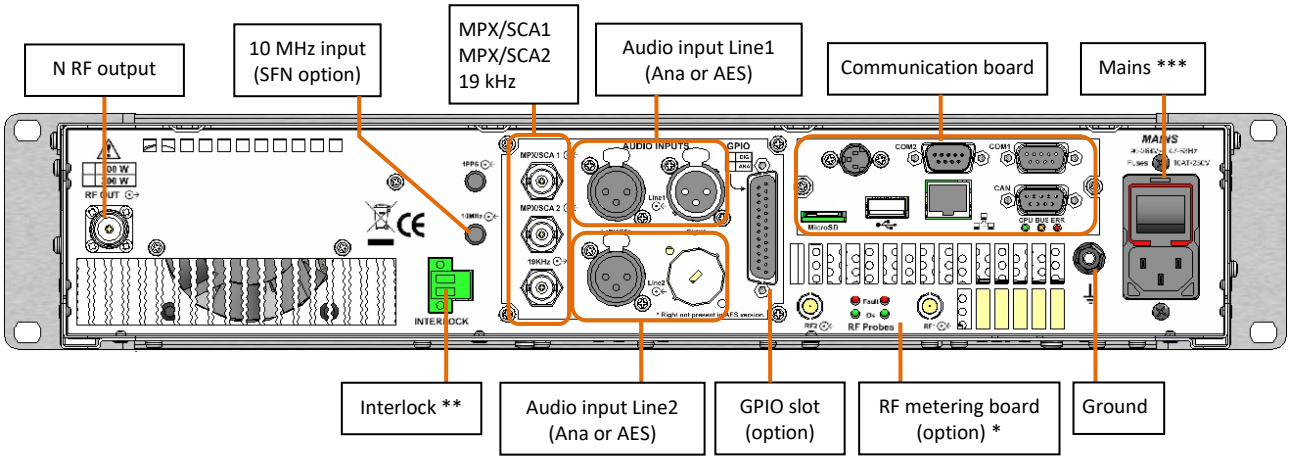
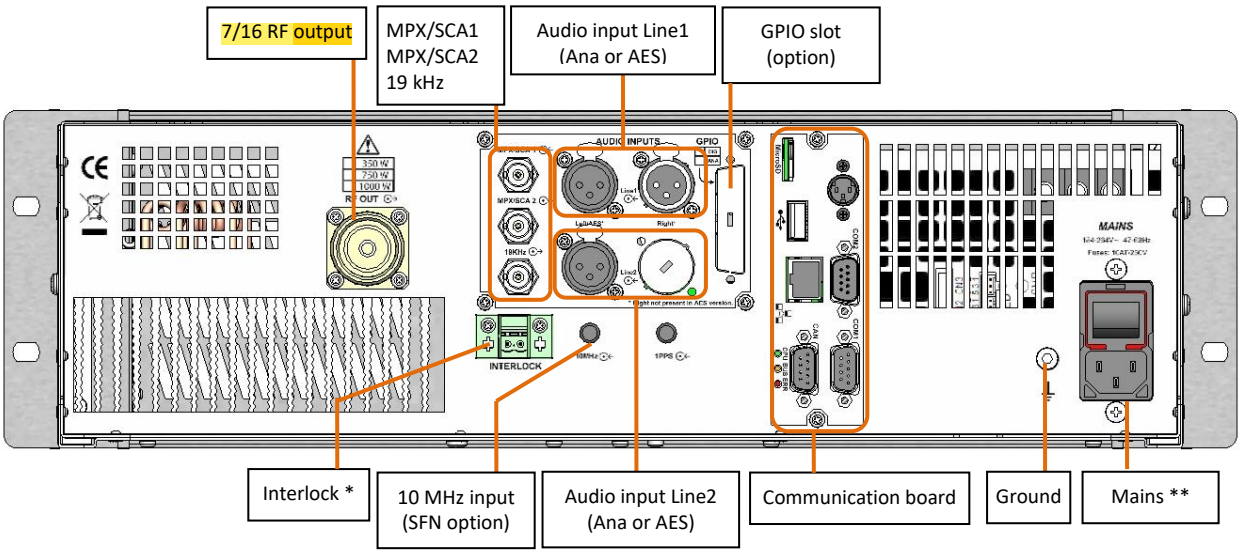
2.3.2. Rear panel

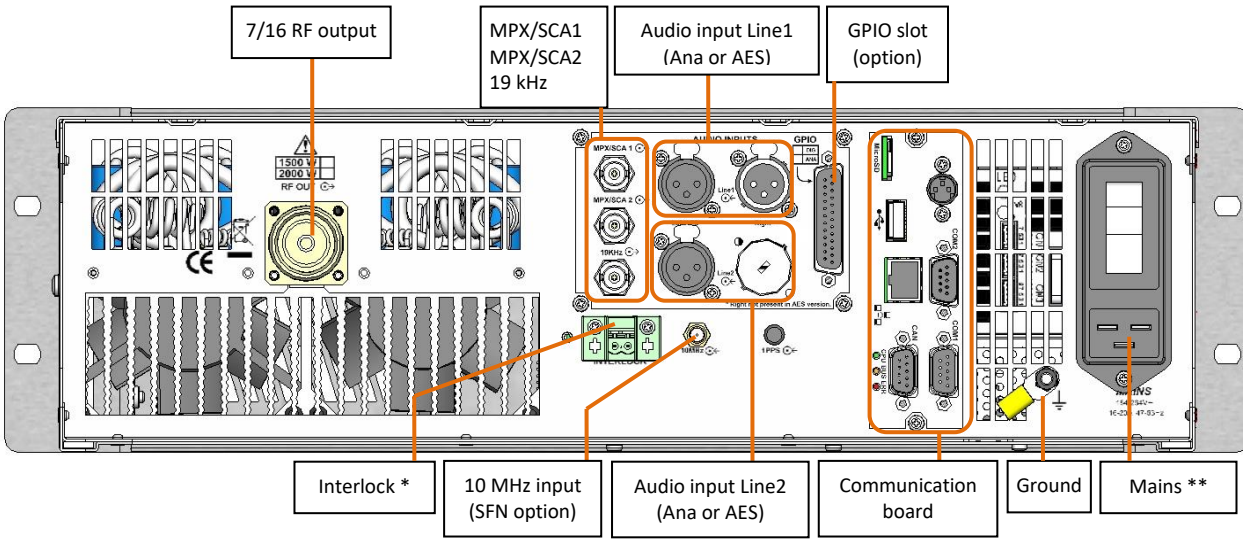
ECRESO FM 100W / 300W



ECRESO FM 750W / 1000W



ECRESO FM 1500 W / 2000 W



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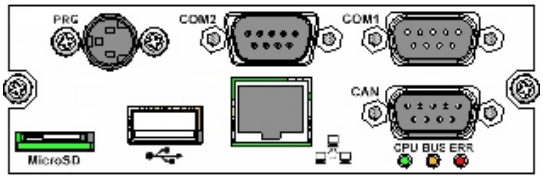
TCP/IP communication board

- 2 RS232 ports (COM1 and COM2)
- 1 µSD card
- 1 USB port
- 1 Ethernet port
- 1 CAN port
- 1 DIN port

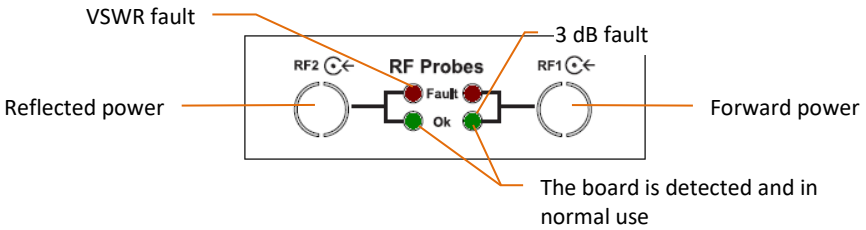


On the TCP/IP board, the COM1 port is used to send serial commands, the COM2 port is used for dynamic PS tags.

The DIN port is used to reprogram the module (only to be used for maintenance).

The µSD card is an external storing device meant to mostly stay in place. Removing and setting it back triggers error messages visible on the embedded web site; it should therefore only be done during maintenance operation procedures. See section 5.15 for the µSD card removal procedure.

* The optional **RF metering board** measures the power on modular systems (1 ECRESO FM + several amplifiers FM).



The values for the direct power and the forward power can be retrieved in the TX menu on the front panel or with the serial commands TX.PFWD and TX.PREF.

** The safety loops must be closed to ensure the transmitter will work. If nothing is connected to these connectors, interlock plugs must be present to close the loop.

*** The supplied power cable is fitted with a locking system which prevents accidental disconnections.

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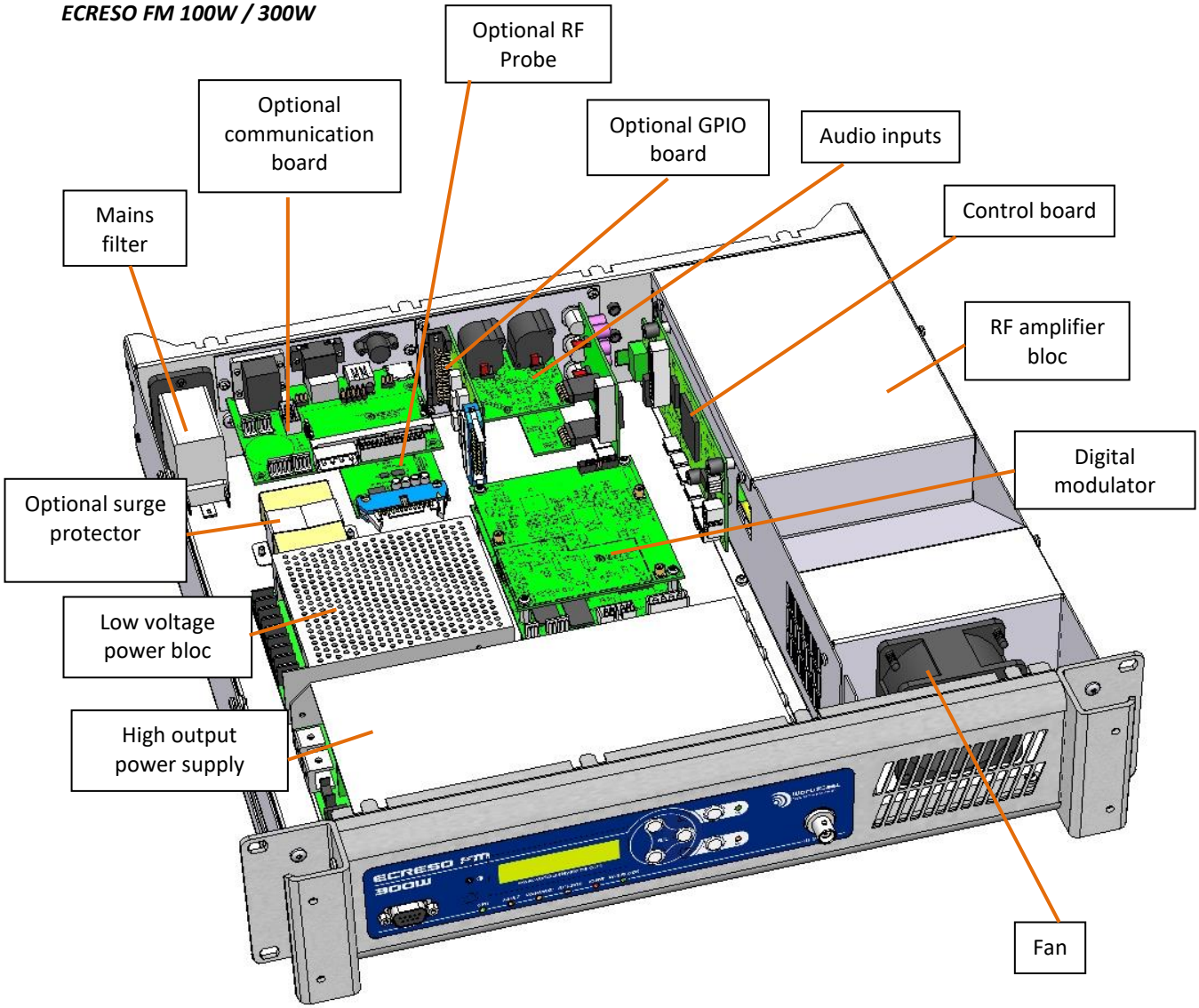
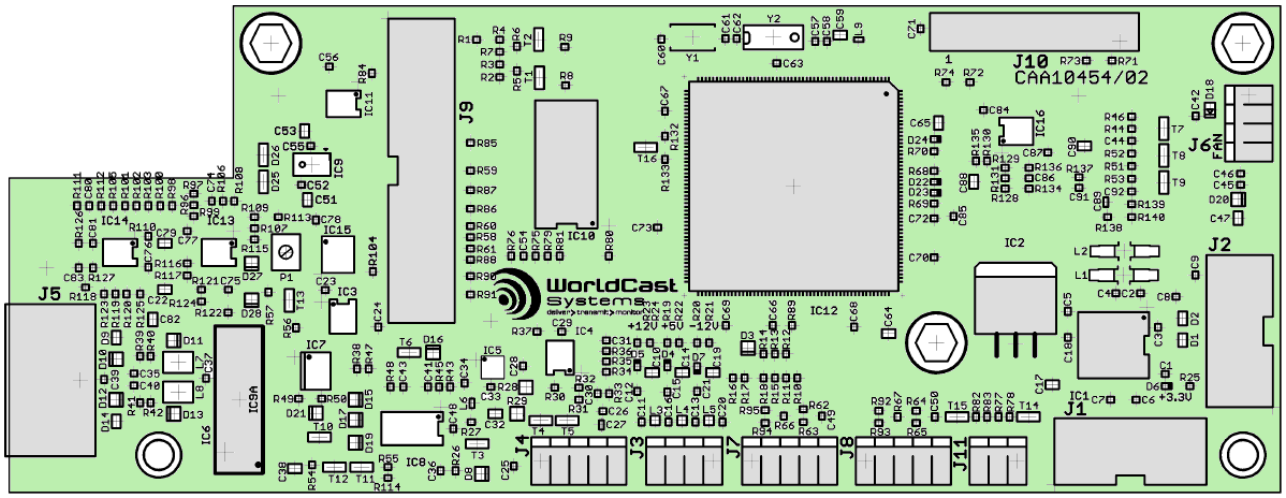
2.3.3. Opened cover

ECRESO FM 100W / 300W



Control board ECRESO FM 100W / 300W



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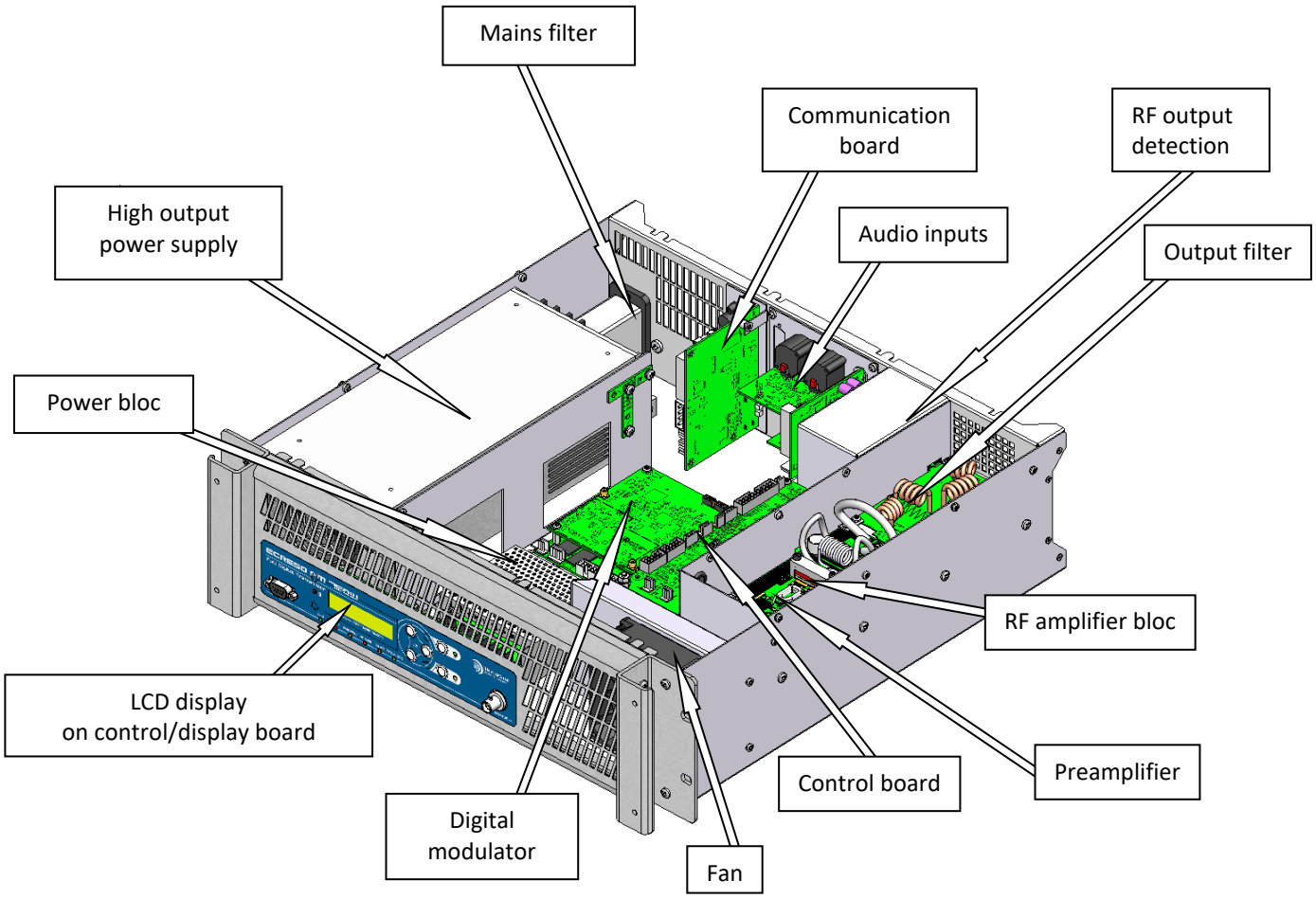
ECRESO FM 750 W / 1000 W



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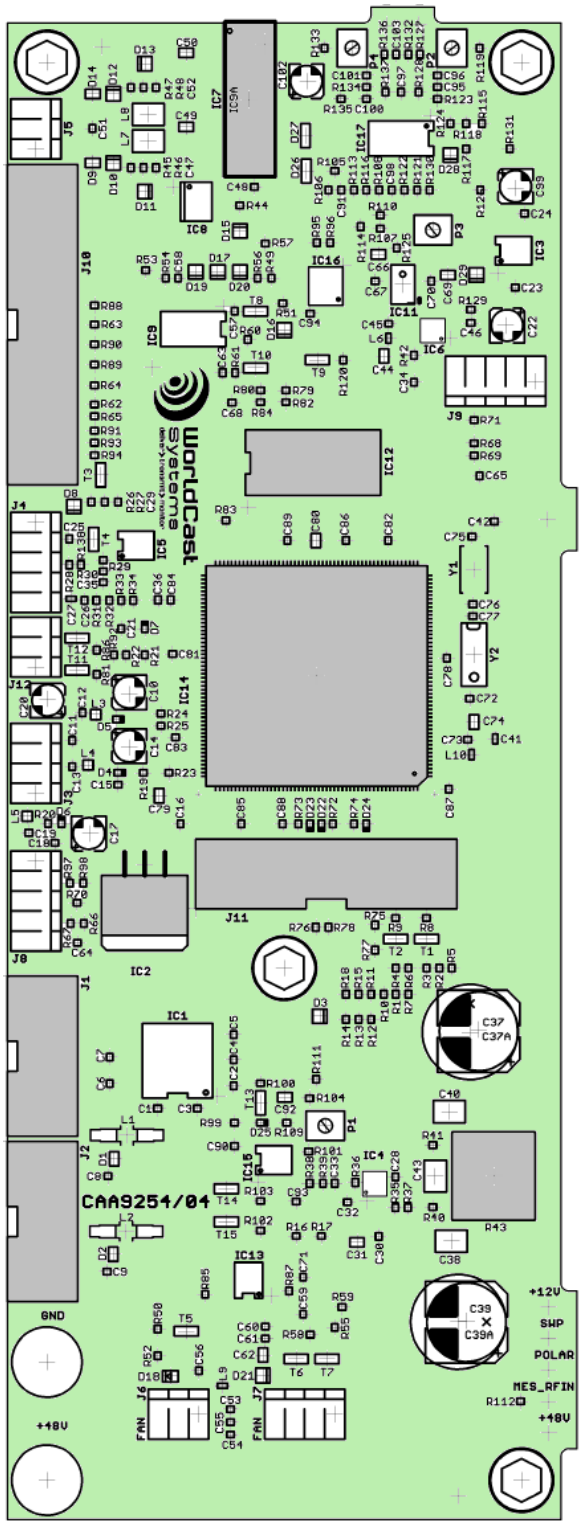
Control board ECRESO FM 750 W / 1000 W



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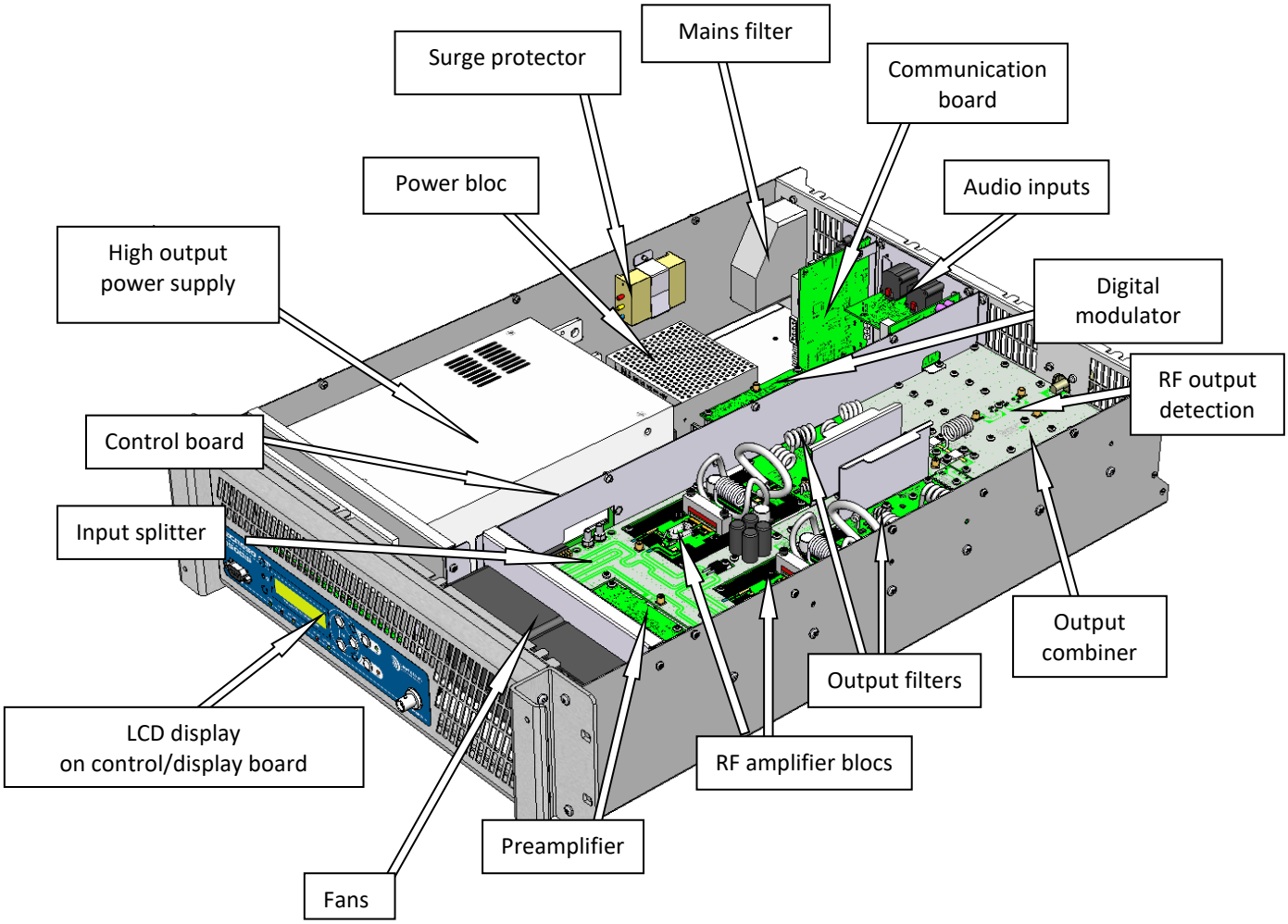
ECRESO FM 1500 W / 2000 W



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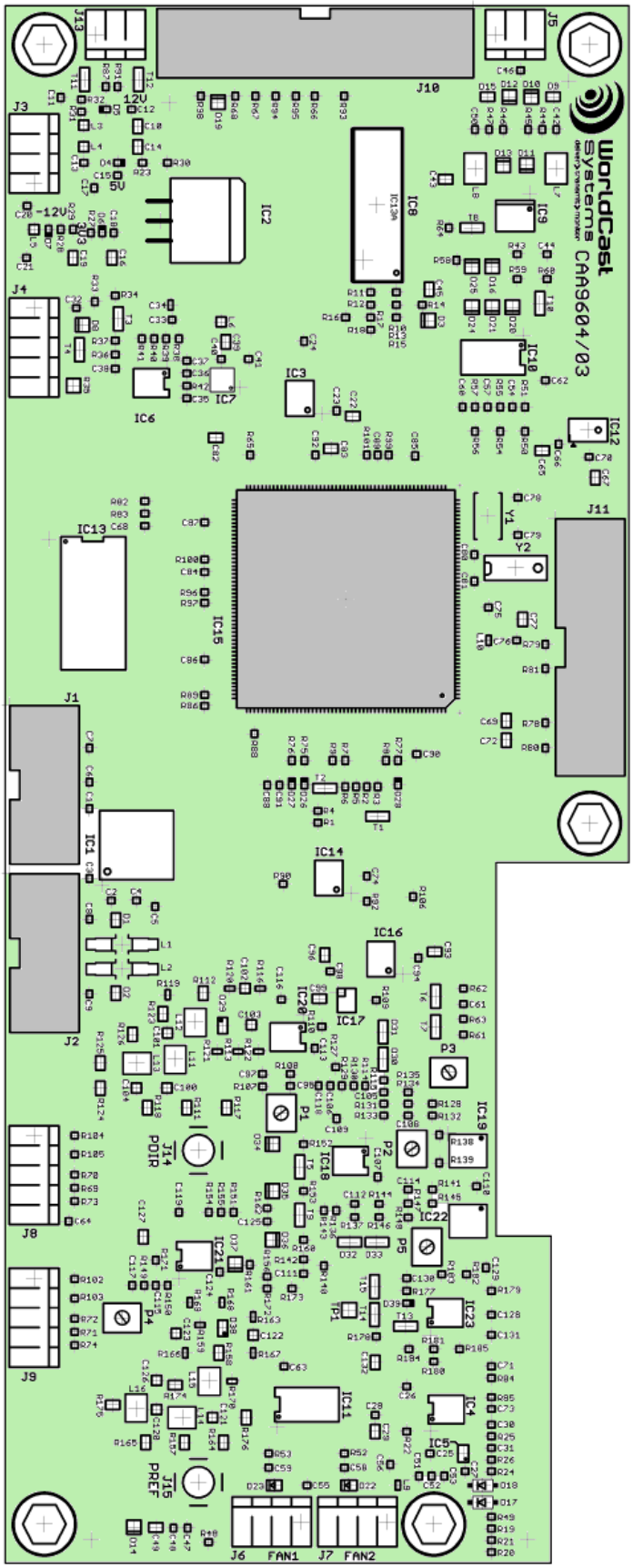
Control board ECRESO FM 1500 W / 2000 W



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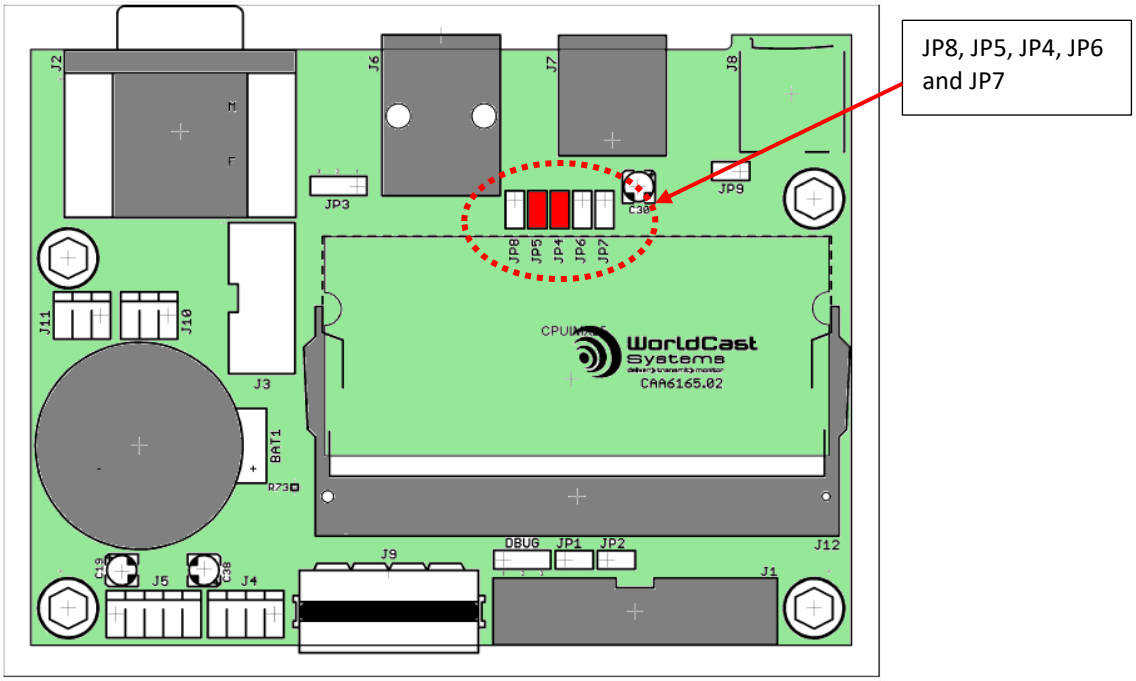
IP board – all powers



JP4 – JP5: jumpers are present.

JP6 – JP7 – JP8: no jumpers.

These jumpers make it possible to set the starting mode. ***Factory settings – do not modify.***

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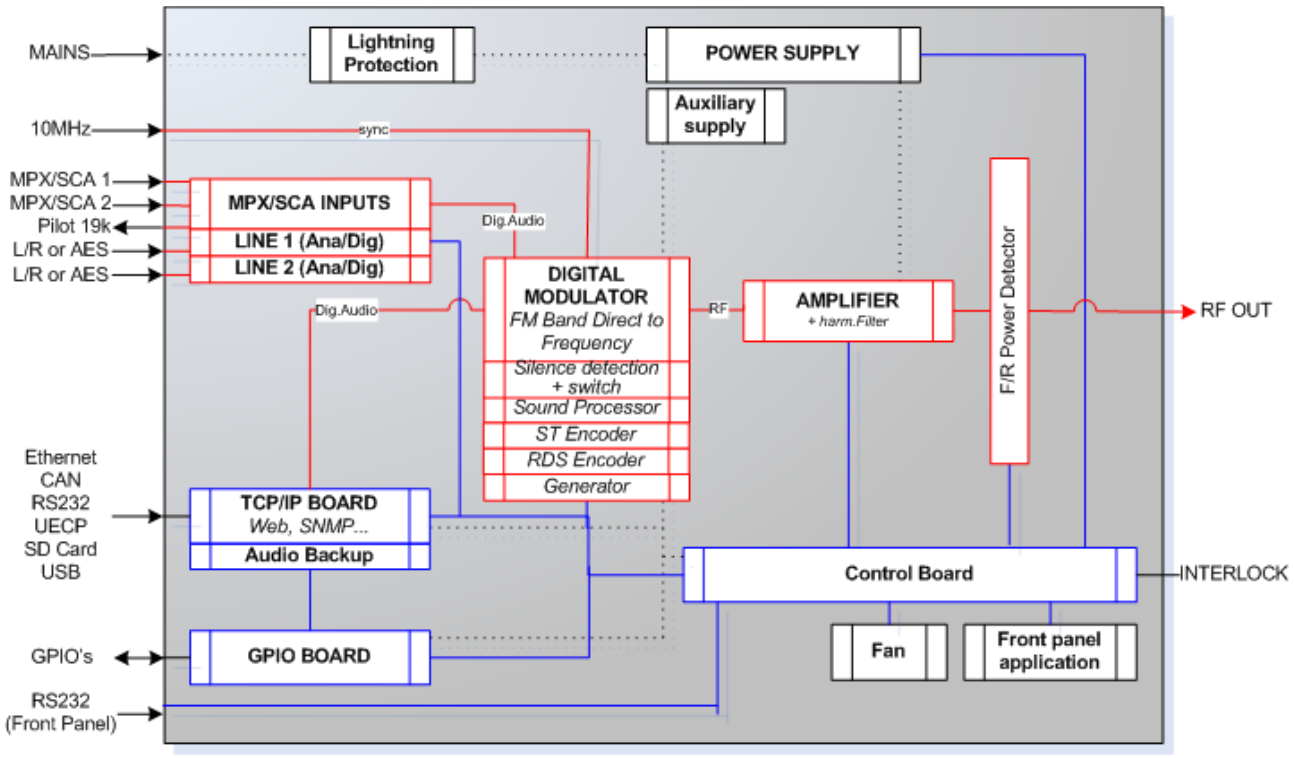
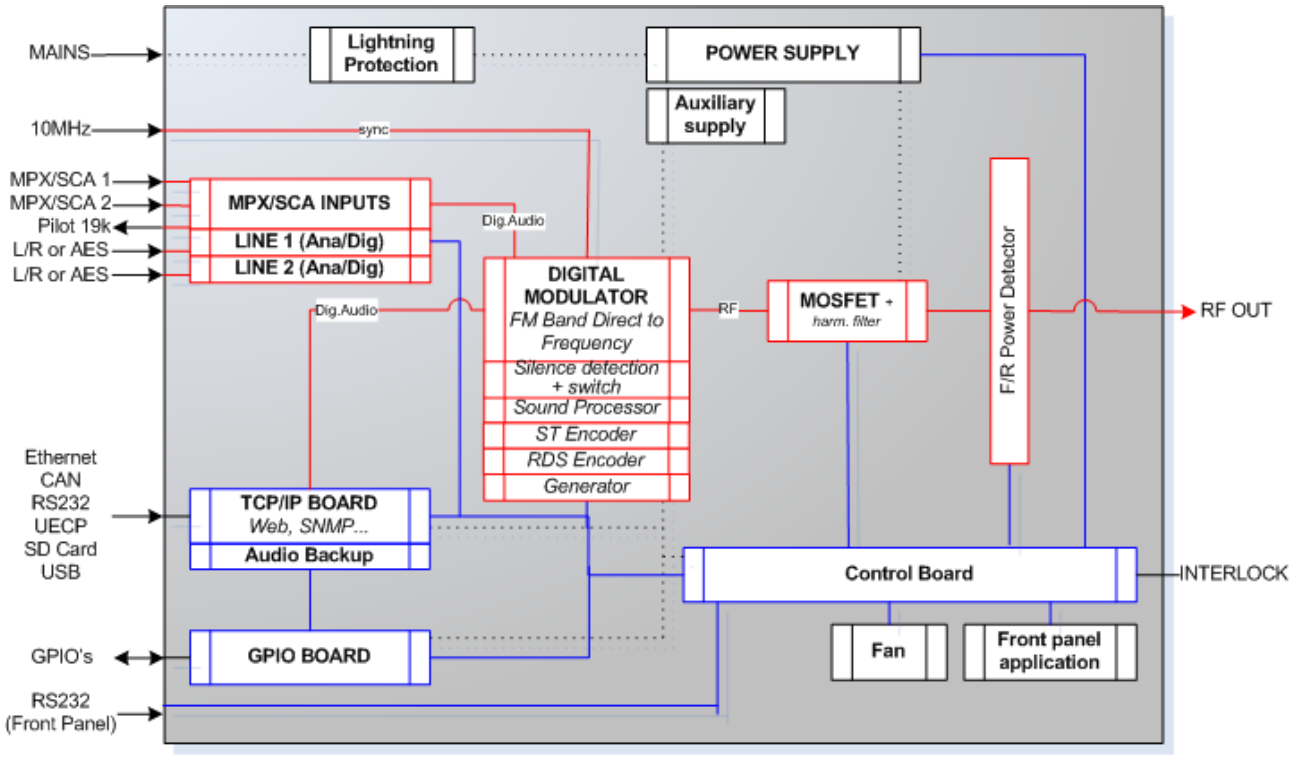
2.3.4. Synoptic diagram

ECRESO FM 100W / 300W



ECRESO FM 750 W / 1000 W



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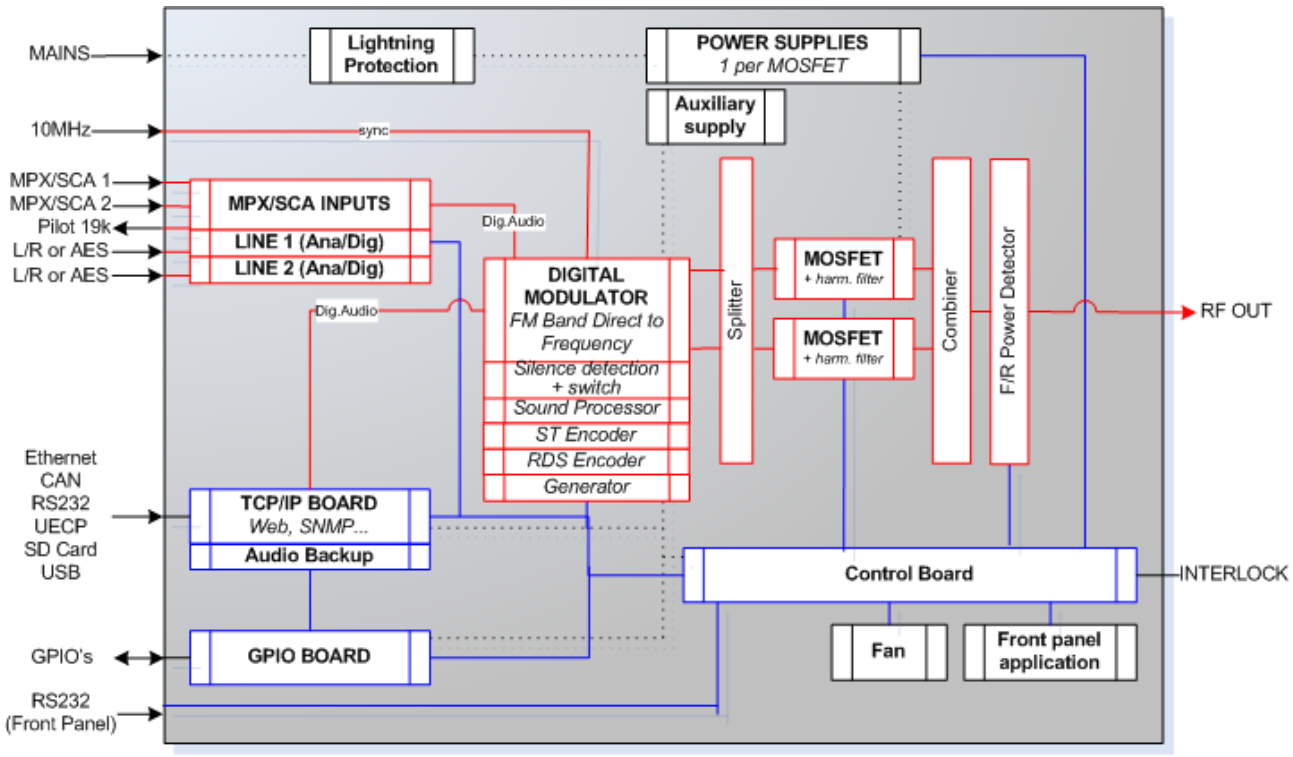
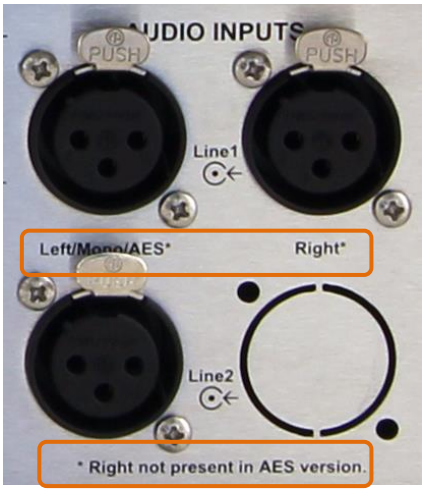
ECRESO FM 1500 W / 2000 W





On transmitters, as standard:

- Line 1 is an analog audio input (**Left** and **Right**)
- Line 2 is a digital input (**AES**, 1 connector)

For an analog mono signal, use the left channel (**Mono**); for a digital mono signal use the AES input.

Line 1 is not necessarily the main audio channel. Depending on the desired configuration, use Line 2 or MPX inputs as the main audio source (see section 5.3).

! ***Do not inject a digital signal on L and R channels, or an analog signal on the AES channel!***

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2.4. Protecting the transmitter

To ensure the transmitter will work with no risk of damage, a series of protections has been set.

2.4.1. Surge Protector

An optional surge protector module can be added to the chassis. The goal of this module is to limit the surge caused by lightning. It works after the main protector usually located in the electrical board and before the power supply protector, thus offering an optimal level of protection. The protector principle is to capture the surge and divert it to the ground so as to protect the transmitter and its power supplies.

The surge protector used by WorldCast Systems includes multi-MOV technology and a gas discharge tube (GDT) giving a very high protection and very low parasitic capacitance and leakage currents.

Please refer to Appendix B 'Maintenance' for the procedure to replace the surge protection module.

2.4.2. Protection against VSWR

Several systems coexist to offer the optimal protection against VSWR:

- Hardware protection:
  In case of open circuit or short-circuit, the RF is cut. When the situation returns to normal, it is automatically reset. The protection is triggered in case of an overshoot of the reflected power over:

Transmitter power	100 W	300 W	750 W	1000 W	1500 W	2000 W
Threshold	20 W	25 W	50 W	55 W	90 W	90 W

- Software protection:
  The software protection prevents the transmitter to reach a given reflected power value by blocking the control or by lowering the power.

Transmitter power	100 W	300 W	750 W	1000 W	1500 W	2000 W
Threshold	15 W	20 W	40 W	45 W	80 W	80 W

- Software settings for the reflected power security management: if the VSWR is greater than 3 in a recurring way, enabling the VSWR Trip parameter allows disabling then cutting the RF (see VSWR Trip, section 5.4).

2.4.3. Protection against high temperature

The Power Supply module includes its own protector against high temperature: the protector cuts off the power supply output voltage if the temperature is abnormally high. When the situation returns to normal, it is automatically reset. The temperature threshold value varies depending on the PSU.

The ambient temperature and the heatsink temperature are monitored.

- The max ambient temperature is set by software (see menu Temp/Fan, section 6.3.18 or serial command CONF.AMB.MAX, section 7.2.4), default value is 50°C. In case of overshoot, a Warning alarm is triggered (Alarm Amb). The default value works when the room temperature is controlled. In case the room temperature is likely to be greater than 35°C, the value should be increased accordingly, but should not exceed 70°C.
- The max heatsink temperature is set by serial command (see serial command CONF.HEAT.MAX, section 7.2.4), default value is 65°C for transmitters from 750 to 1000 W, 70°C for 1500 W transmitters and 80°C for 2000 W transmitters. In case of overshoot, a Warning alarm is triggered (Alarm Heat).
- The max internal temperature is set at 70°C for transmitters from 20 to 1000 W, 70°C for 1500 W transmitters and 80°C for 2000 W transmitters. If the temperature exceeds 70°C, the RF is cut off and a fault alarm is triggered (Alarm Temp).

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2.4.4. Protections incorporated into the PSU

All Ecreso FM and Ecreso FM Amplifier module from 300 to 2000 W have an auxiliary power block and a power block, each having its own protections:

- Against overloads: protects by limiting the current. For auxiliary power supplies, it is a protection against shorts circuits.
- Against overvoltage.
- Against high temperatures (see previous section).

The main power supply voltage and the auxiliary power supply voltage are monitored as follows:

- Main power supply:
  if the difference between the measured voltage and the expected voltage is greater than 10%, a Warning alarm is triggered (Alarm Volt1). Expected voltage is automatically computed.
- Auxiliary power supply:
  Voltage should be either 5, 12 or -12 V. if the difference between the measured voltage and the nominal voltage is greater than 10%, a Warning alarm is triggered (Alarm Volt Aux).

For both power supplies, we are monitoring the output voltage (DC); the input is not monitored.

The current is also measured and monitored. The threshold varies depending of the power of the Ecreso FM: 10 A for the Ecreso FM 100 W, 10 A for the Ecreso FM 300 W, 23 A for the Ecreso FM 750 W, 29 A for the Ecreso FM 1000 W, 26 A per amplifier pallet for the Ecreso FM 1500 W, 31 A per amplifier pallet for the Ecreso FM 2000 W. In case of overshoot, a Warning alarm is triggered (Alarm Cur) and the nominal power is reduced.

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3. TECHNICAL SPECIFICATIONS

3.1. Environmental

Nominal operating temperature	5°C to 45°C
Maximum operating temperature	0°C to 50°C
Warehousing temperature	-20°C to +70°C
Humidity	5 - 95 % non-condensing relative humidity
Altitude	Up to 3900 m
Warehousing time	< 10 years
Cooling	Internal ventilation
Ecreso FM 100W / 300W	1 fan: between 10 l/s and 30 l/s depending on ambient temperature
Ecreso FM 750W / 1000W	1 fan: ~30 l/s
Ecreso FM 1500W / 2000W	2 fans: ~60 l/s

3.2. Power supply

Voltage	100 VAC to 264 VAC for Ecreso FM 100W – 300W
	184 VAC to 264 VAC for Ecreso FM 750W – 2000W
Frequency	47 Hz - 63 Hz
Max consumption	200 W (100W version)
	500 W (300W version)
	1150 W (750 W version)
	1550 W (1000 W version)
	2300 W (1500 W version)
	3050 W (2000 W version)
Power factor	> 0.9
Fuses (ECRESO FM 100W - 1000 W)	10 AT

3.3. Physical

ECRESO FM 100 W / 300 W

Overall dimension	487.5 mm X 2U (89 mm) X 475 mm
Rack size without front panel	437.7 X 82 X 443.8 mm (WxHxD)
Enclosure depth required	600 mm
Mounting	19’’enclosure, with 4 M6X12 screws
Weight	
Ecreso FM 100W	around 9 kg
Ecreso FM 300W	around 9.5 kg

ECRESO FM 750 W / 1000 W

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Overall dimension	19'' (482.6 mm) X 3U (133.5 mm) X 470 mm
Rack size without front panel	440.4 X 126.2 X 432 mm (WxHxD)
Enclosure depth required	600 mm
Mounting	19''enclosure, with 4 M6X12 screws
Weight	around 13 kg

ECRESO FM 1500 W / 2000 W

Overall dimension	19'' (482.6 mm) X 3U (133.5 mm) X 690 mm
Rack size without front panel	440.4 X 126.2 X 620 mm (WxHxD)
Enclosure depth required	700 mm
Mounting	19''enclosure, with 4 M6X12 screws
Weight	around 18 kg

3.4. Interface panel

Indicators	Green LED: CPU activity
	Red LED: major fault
	Yellow LED: minor fault
	Red LED: RF fault (3 dB)
	Red LED: VSWR fault
	Green LED: safety interlock
	Green LED: RF on
	Yellow LED: local mode
Screens	Back lighted LCD: displays operating parameters and menus.
Buttons	RF, local, +, -- and OK

3.5. RF section

Frequency range	87.5 to 108 MHz
Setting increment	10 kHz
Frequency stability	< 10^{-6} per year
Power range	5-100 W, 20-300 W, 50-750 W, 50-1000 W, 150-1500 W or 200-2000 W
Power setting	continuously 0-110 W, 0-350 W, 0-750 W, 0-1050 W, 0-1550 W or 0-2050 W
VSWR	< 1.35
	Optimal performance: < 1.1
	Protection: > 1.5
Spurious and harmonic suppression	> 75 dBc
10 MHz input connector (SFN option)	SMA
10 MHz input recommended range	-10 dBm to +10 dBm

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3.6. Composite operation

Bandwidth	> 40 Hz to 53 kHz @ 0.1 dB
	> 20 Hz to 60 kHz @ 0.2 dB
	> 60 kHz to 80 kHz @ 0.4 dB
Intermodulation distortion	< 0.05%
FM S/N ratio	> 80 dB RMS @ 75 kHz deviation
AM noise	> 55 dB, weighted/unweighted, sync/async, RMS/CCIR (20-20 000 Hz)

3.7. Stereo operation

Bandwidth	> 20 Hz to 15 kHz @ 0.1 dB
38 kHz discontinuance	> 50 dB
Stereophonic crosstalk	> 50 dB
Preemphasis	0 µs, 50 µs or 75 µs

3.8. Mono operation

Bandwidth	> 40 Hz to 15 kHz @ 0.1 dB
Out of band rejection	> 40 dB @ 19 kHz
Preemphasis	0 µs, 50 µs or 75 µs

3.9. AF inputs

Analog (LINE1)

Connector	XLR type
Impedance	> 10 kΩ by default, adjustable to 600 Ω by jumpers, balanced
Bandwidth	Software adjustable
Level	Software adjustable (-18/+18 dBu range)

AES (LINE2)

Connector	XLR type
Impedance	> 110 Ω balanced
Bandwidth	Software adjustable
Level	Software adjustable (-20 to 0 dBFS range)
Sampling rate	Auto adjusted up to 192 kHz
Bit	16, 24, 32

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Multiplex (MPX/SCA)

Connector	BNC type for Ecreso FM 100-300W
	7/16 type for Ecreso FM 750-2000W
Impedance	> 5 kΩ unbalanced
Level	Software adjustable (-18/+18 dBu range)

3.10. HF output

Connector	N for Ecreso FM 100W - 300W
	7/16 DIN for Ecreso FM 750W - 2000W
Impedance	50 Ω
Monitoring (RF Monitor)	
Level	
ECRESO FM 100W	10 dBm @ 100 W at main output
ECRESO FM 300W	10 dBm @ 300 W at main output
ECRESO FM 750 W / 1000 W	10 dBm ± 3 dB @ 750 W at main output
ECRESO FM 1500 W / 2000 W	10 dBm ± 3 dB @ 1500 W at main output

3.11. Miscellaneous

Marking	CE
Directive and Standards	RED 2014/53/UE, 2014/30/UE and 2014/35/UE
	EN 301 489-1 V1.9.2
	EN 60 215:1989, A1 :1992, A2 :1994
	EN 300 384, 1998
	EN 302 018-2 V2.1.1
Lithium battery	1 on the control board + 1 on the TCP/IP board
Control board battery life expectancy	> 20 years in storage (longer when used)

Typical performances unless otherwise noted. Unit compliance is contingent to the compliance of its environment

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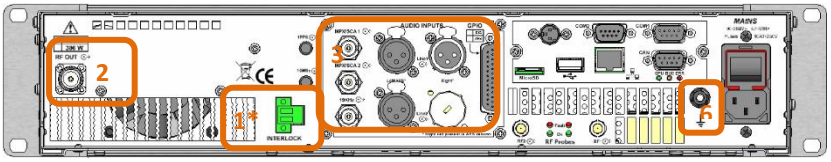
4. STARTING UP YOUR TRANSMITTER

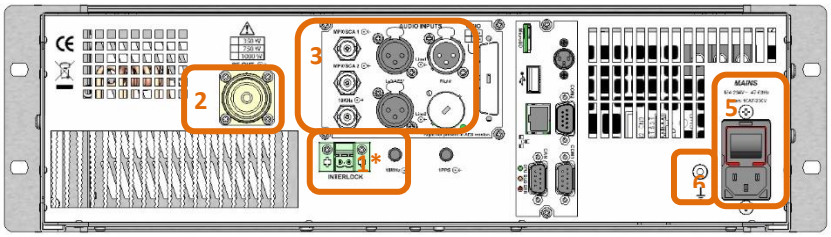
! ***The transmitter should never be operated without a suitable antenna or test dummy load, and an overall proper installation. Failure to observe this requirement may result in damage to the transmitter that is not covered by the warranty.***

4.1. Connecting the transmitter



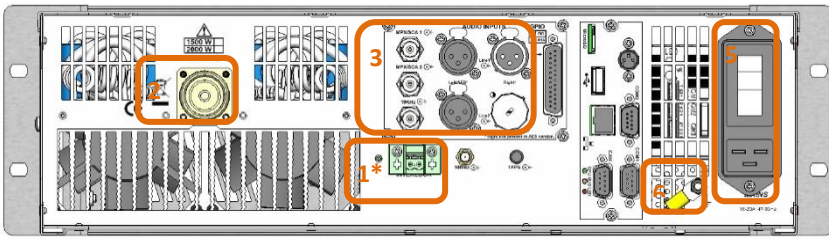
Rear panel

ECRESO FM 100 W / 300 W



Rear panel

ECRESO FM 750 W / 1000 W



Rear panel

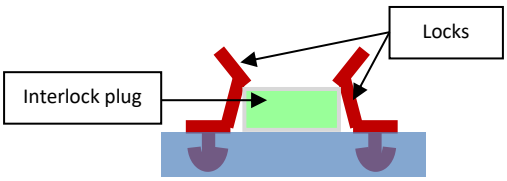
ECRESO FM 1500 W / 2000 W

Front panel ECRESO FM 100W / 300W

Front panel ECRESO FM 750W- 2000W

CAN address:
ID01

** Secure the interlock plug if needed:*



1. Make sure the interlock plug present on the rear panel; secure it using the provided locks if needed.

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2. Connect the transmitter RF output to a 50 Ω load with a wattmeter.

   The 50 Ω charge power must be:

   - greater than 150 W for a 100 W transmitter,
   - greater than 400 W for a 300 W transmitter,
   - greater than 1000 W for a 750 W transmitter,
   - greater than 1250 for a 1000 W transmitter,
   - greater than 1875 W for a 1500 W transmitter,
   - greater than 2500 W for a 2000 W transmitter.

   When you acquired your transmitter, the RF amplifier is deactivated and power is set to 0 W. These settings can be adjusted using the PC application, the front panel application, serial commands or with the web interface.

3. Connect the audio or MPX inputs.
4. To use the PC application or the serial commands, connect a PC to the serial port on the front panel of the ECRESO FM.
   If your PC does not have a RS-232 port, use a USB/RS-232 cable.
5. Connect to power using the provided cable; you may unscrew the cable loop and pass the power cable through it to secure it.
6. **Make sure to ground the transmitter properly, use provided ground strap if needed.**
7. Press the Local button on the front panel, then the RF button.

To configure the transmitter using the front panel: see section 4.2.

To configure the transmitter using the embedded web site (with Communication Pack only)**:** see section 4.4.

To use serial commands, see chapter 7.

To configure the transmitter using the PC application, see chapter 8.

4.2. Using the front panel

Please refer to section 6.2 for front panel working principle.

4.2.1. Setting the transmitter

! ***The transmitter must be in local mode before parameters can be modified. Press the Local button if needed.***

Set the power (in W), the frequency (in MHz) and enable the RF:

```
 98.00MHz          0W
```

From the main screen, press the "Enter" key to display menus then the "+" key until you see the TX Parameters menu.

```
 98.00MHz          0W
-> TX  PARAMETERS >
```

Once you see this screen, press "Enter"

```
1      FREQ     PFWD
   ->  98.00        0
```

You may now set the frequency and the power. The arrow preceding the frequency indicates that this parameter is selected: press "Enter" to switch to edit mode.

```
1      FREQ     PFWD
   ->  98.00        0
```

Using the "+" and "–" keys, adjust the frequency starting with the last digit. Once you've reached the desired value, press "Enter" to go to the next digit. Follow the same procedure for

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all digits and confirm with the “Enter” key. Use the "+" to go the next screen.

```
1  PWR     PFWD   PREF
   -> 100     100    52
```

The arrow now appears before the power: set the power in the same way you set the frequency.

After confirming the power value with the “Enter” key, enable the RF using the front panel button.

```
1        GO  TO
       MAIN    -> RF
```

Press the “+” key until you see this screen. When the RF menu is selected, press “Enter” to return to the list of menus.

4.2.2. Input selection

```
        GO  TO
 -> INPUT  SWITCH >
```

Press the “+” key until you see the Input Select menu. Then press the “Enter” key.

```
1  INPUT  SELECT
     -> MODE : MANU
```

Browse through the Input Select menu using the “+” and “–” keys to switch to manual mode.

```
1  INPUT  SELECT
     -> MAIN : LINE1
```

Select the current input:

- "LINE1" for analog (see sections 4.2.4 to 4.2.6)
- "LINE2" for AES (see sections 4.2.4 to 4.2.6)
- "MPX1" for MPX (see sections 4.2.3 and 4.2.6)
- "MPX2" for MPX (see sections 4.2.3 and 4.2.6)
- "PLAYER": µSD card (with Communication Pack only)
- “GENE”: internal generator

Use the “Enter” key to switch to edit mode, the “+” and “–” keys to adjust values and the “Enter” key to confirm.

```
1        GO  TO
 MAIN   -> INPUT  SEL
```

Press the “+” key until you see this screen. When the Input Sel menu is selected, press “Enter” to return to the list of menus.

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4.2.3. Setting the MPX inputs

```
          G O   T O
     -> M P X   A N A >
```

Press the “+” key until you see the MPX Ana menu. Then press the “Enter” key.

```
1         M P X   A N A
          -> M P X 1 >
```

Press the “Enter” key once more to set the MPX1 input.

```
2   M P X - A N A -> M P X 1
  -> L E V E L : + 0 6 . 0 0
```

Browse through the MPX1 menu using the “+” and “–” keys to set the nominal level between -50 and +50 dBu,

Use the “Enter” key to switch to edit mode, the “+” and “–” keys to adjust values and the “Enter” key to confirm.

```
2         G O   T O
  -> M P X - A N A     M P X 1
```

Press the “+” key until you see this screen. When the MPX-ANA menu is selected, press “Enter” to return to main MPX menu and set the MPX2 input in the same way.

```
1         G O   T O
  -> M A I N     M P X - A N A
```

To return to the main screen, press the “+” key until you see this screen. When the Main menu is selected, press “Enter” to return to the list of menus.

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4.2.4. MPX configuration

```
        G O   T O
  -> S T   E N C O D E R >
```

Press the “+” key until you see the ST Encoder menu. Then press the “Enter” key.

```
1     S T   E N C O D E R
 -> M O / S T : S T E R E O
```

Press once again the “Enter” key to set the audio type. Select what you need using “+” and “–” keys: STEREO or MONO.

```
1        G O   T O
    M A I N    -> C O D E R
```

Confirm with the “Enter” key and press “+” until you see this screen. When the CODER menu is selected, press “Enter” to return to the list of menus.

Confirm with the “Enter” key and press “+” until you see this screen. When the CODER menu is selected, press “Enter” to return to the list of menus.

```
        G O   T O
  -> S T   E N C O D E R >
```

Press the “+” key until you see the Modulation menu.

```
        G O   T O
  -> M O D U L A T I O N >
```

Then press the “Enter” key.

```
1    M O D U L A T I O N
 -> D E V   M P X : 1 2 7 . 2
```

Browse through the Modulation menu using the “+” and “–” keys to set the total deviation between 0 and 150 kHz,

```
1    M O D U L A T I O N
 -> D E V   P I L O T : 1 8 . 4
```

set the pilot deviation between 0 and 25.5 kHz.

For each of these values, use the “Enter” key to switch to edit mode, the “+” and “–” keys to adjust values and the “Enter” key to confirm.

```
1        G O   T O
 M A I N -> M O D U L A T I O N
```

Press the “+” key until you see this screen. When the Modulation menu is selected, press “Enter” to return to the list of menus.

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4.2.5. Setting the analog or AES inputs

```
          G O   T O
     -> L I N E 1 >
```

Press the “+” key until you see the Line1 (or Line2) menu. Then press the “Enter” key.

```
1         L I N E 1
  -> L E V E L : + 0 6 . 0 0
```

Browse through the Line1 (or Line2) menu using the “+” and “–” keys to set the nominal level between -50 and +50 dBu.

Use the “Enter” key to switch to edit mode, the “+” and “–” keys to adjust values and the “Enter” key to confirm.

```
1         G O   T O
   M A I N     -> L I N E 1
```

Press the “+” key until you see this screen. When the Line1 (or Line2) menu is selected, press “Enter” to return to the list of menus.

Default transmitter pre-accentuation is 50 µs. Depending on your country, you might need to switch it to 75 µs (in the United States for instance). The Pre-accentuation parameter is only visible in Expert mode; you must therefore first change the front panel working mode:

```
 9 8 . 0 0 M H z      1 0 0 W
        -> E A S Y
```

Press the “+” key until you see the Easy menu. Then press the “Enter” key, “+” and “Enter” again to switch to Expert mode.

```
          G O   T O
     -> L I N E 1 >
```

Go back to the Line1 menu. Press the "Enter" key then the “+” key to change the pre-accentuation.

```
1         L I N E 1
     -> P R E A C : 5 0
```

Use the “Enter” key to switch to edit mode, the “+” and “–” keys to adjust values and the “Enter” key to confirm.

```
1         G O   T O
  -> M A I N     -> L I N E 1
```

Press the “+” key until you see this screen. When the Line1 (or Line2) menu is selected, press “Enter” to return to the list of menus.

4.2.6. Getting on air

1. Disable the RF using the front panel RF button.
2. Make sure the RF indicator LED is off.
3. Disconnect the load and connect the antenna to the transmitter RF output.
4. Enable the RF again using the front panel RF button.

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4.3. With the Communication Pack option

4.3.1. Network configuration

If the Communication Pack option is enabled, first set the IP address with the front panel:

```
 98.00MHz          0W
```

From the main screen, press the "Enter" key to display menus then the “+” key until you see the Network menu.

```
 98.00MHz        100W
    -> NETWORK >
```

Once you see this screen, press “Enter”.

```
1  NETWORK-> ADR
-> 192.168.012.103
```

The IP address screen is displayed: press “Enter” to switch to edit mode. Use the “+” and “–” keys to adjust values and the “Enter” key to confirm.

```
1  NETWORK-> MASK
-> 255.255.255.000
```

Press the “+” key to display the Netmask and modify it if needed. Press the “Enter” key to confirm.

4.3.2. Connecting to the web interface

Now the transmitter is set, connect it to the network.

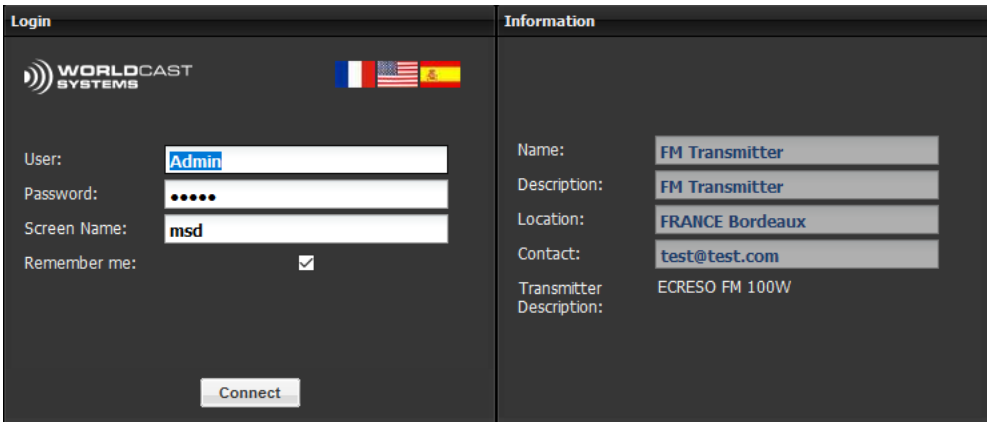
ⓘ *Though the web application is compatible with most browsers, performances vary from one browser to another. For optimal performances, Google Chrome is recommended.*

ⓘ *The browser may display a message indicating that the connection is not certified; however, the site is secured (data is encrypted) and you may proceed to access it. To prevent these potential blocking and warning messages, WorldCast Systems now supplies certificates for HTTPS browsing, see section 9.6.5 for more information.*

Open a web browser and enter in the address bar the transmitter’s IP address such as it was set above.

Select the language if necessary.

Enter the user name and password (default: **Admin** / **admin**) and the screen name of your choice. It is used to communicate with other connected users.



You can now access the web interface.

❗ ***The transmitter must be in remote mode before parameters can be modified. Press the Local button if needed.***

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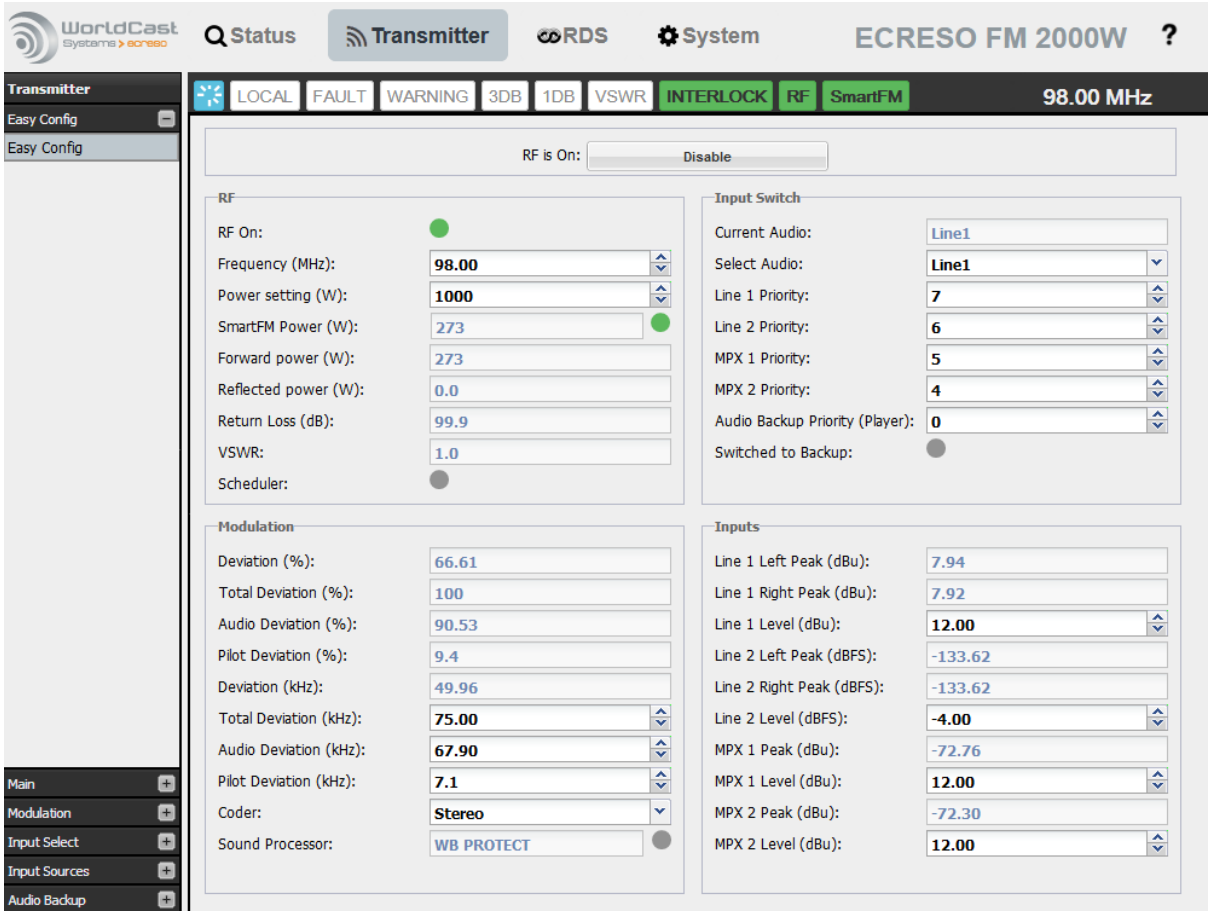
4.3.3. Configuring the transmitter

Click the button Transmitter in the tool bar to access the transmitter configuration and display the 'Easy Config' page.



Basic configuration can be managed on this single page:

- Power, frequency and RF on
- Input priority setting
- MPX configuration
- Input configuration

Default transmitter pre-accentuation is 50 µs. Depending on your country, you might need to switch it to 75 µs (in the United States for instance). The Pre-accentuation parameter is available in the Input Source section.

Once values have been changed, click the button ✔Save to save the new settings.

4.3.4. Getting on air

1. Disable the RF by clicking the button on top of the page.
2. Make sure the RF indicator LED is off.
3. Disconnect the load and connect the antenna to the transmitter RF output.
4. Enable the RF again by clicking the button on top of the page.

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5. OPERATION AND PARAMETERS DESCRIPTION

5.1. Overview

Four interfaces are available to set the transmitter:

- The front panel menus for local configuration – see chapter 6
- The serial/Telnet commands for local or remote configuration – see chapter 7
- The Engi PC application for local or remote configuration – see chapter 8
- The embedded web site for remote configuration – see chapter 9

In all cases, parameters are as described below.

Remote configuration can only be done if the transmitter is fitted with a TCP/IP board.

5.2. Local mode

The local mode is used for maintenance operations. It allows the technician to make sure nobody nor any system will control the transmitter during the operation.

Enable/Disable the local mode

- With the front panel local button. The lit yellow LED indicates the unit is in local mode; it is in remote mode when the LED is off.
- With a serial command:
  - for a module: CONF.MODE= LOCAL or REMOTE,
  - for a transmitter: TX.MODE=LOCAL or REMOTE.

Modification of the configuration with local interfaces

In local mode, the transmitter can be modified using the front panel application (see chapter 6), with serial commands (see chapter 7) or with the PC application (see chapter 8).

Disabling remote control interfaces

If the module is equipped with the GPIO option, in local mode, inputs and outputs are disabled until the transmitter is no longer in local mode (see chapter 11).

If the module is equipped with the Communication Pack option, in local mode, updates with the web site are not accessible.

If the module is an amplifier or a exciter included in a redundant system (non CCU for a exciter) such as a DD, 1+1 or N+1 system, any command from the management unit will not be taken into account by the module.

Signal suppression mode

If the module is equipped with the Communication Pack option, the SNMP includes a “signal suppression” function which works in local mode and makes it possible to not transmit traps associated with maintenance operations (see section 9.7.8 for more details).

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5.3. How to set the inputs

As s**tandard, main available audio inputs** are:

- LINE 1*: L+R analog audio.
- LINE 2: AES/EBU digital audio
- MPX: analog MPX, two channels are available, MPX1 and MPX2

** With the Double AES option, LINE 1 is an AES input.*

*** LINE 2 can also be set as a digital MPX input, using a serial command (SYS.DIGMPX) or with the web site (section 9.6.2).*

All inputs are located on the rear panel (see section 2.3.2).

Input are selected using the front panel, serial commands or the web site (see section 5.5).

To test the transmitter, use the audio generator (see section 5.10) or the player which plays an audio file from the SD card (see section 9.4.6).

For normal operation, set a main channel (usually, Line 1, Line 2, MPX) as well as a backup channel (Line 1, Line 2, MPX, Player). Each is then given a level of priority.

The transmitter will automatically switch to one or more backup channel in case of loss of signal, according to the priority assigned to the channels and the switching parameters (see section 5.5).

For the **RDS**, the following inputs can be used (see section 5.13):

- Either set: in MPX1, MPX2 or internally.
- Or in auto mode, with backup, in which case:
    - If the audio input is MPX1, the RDS source is MPX1
    - If the audio input is MPX2, the RDS source is MPX2
    - If the audio input is LINE 1/LINE2, the RDS source is internal (if the option is enabled).

It is essential to **set audio input levels** so as to obtain the desired deviation. We recommend checking levels with the front panel application readings (see section 6.3.2), and regardless of the situation, to enable the MPX hard clipper (see section 5.14).

5.4. TX/RF parameters

These parameters are available as:

Front panel *	TX PARAMETERS menu	see section 6.3.4
Serial commands	TX and CONF	see sections 7.2.3 and 7.2.4
Engi PC application	Main page	see section 8.2.2
Embedded web site	Transmitter/Main/Parameter page	see section 9.4.2

** Parameters followed by a star (*) are not available on the front panel.*

MAX POWER (TX.PWR_MAX or CONF.PWR_MAX) – read/write *

With this parameter, set the maximum power that can be configured. This can be useful when in a modular system, the exciter power has to be within a given range for the transmitter to work properly, or when the installation (antenna…) has its own limitation.

From 0 to 99999 W (depending on the transmitter's power)

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3 DB (TX.3DB) – read/write

With this parameter, set the triggering threshold for the 3 dB alarm. Default value is half the transmitter's power (also when in auto mode).

From 0 to 9999 dB (depending on the transmitter's power)

MAX VSWR (TX.VSWR.MAX) – read/write

With this parameter, set the triggering threshold for the VSWR alarm. It has no bearing on the VSWR Trip parameter described below.

From 0 to 99.9

INTERNAL REFLECTED LIMIT (STAT.PREFMAX) – read *

This parameter indicates whether the reflected power went over the maximum limit. Depending on the configuration of the CONF.VSWR_TRIG command, it may trigger a VSWR fault.

Off/On

VSWR TRIP (TX.VSWRTRIP) – read/write

With this parameter, enable or disable the VSWR/reflected power safety. With a compact transmitter, in case the VSWR is higher than 3 and the reflected power is greater than the maximum threshold (software threshold as defined in the "Protecting the transmitter" section, chapter 2), the RF is shut off and automatically starts again. With a modular transmitter, in case the VSWR is higher than 3, the amplifier power is set to 0 W, and again to its set value. If the fault is still present, the cut/restart process is repeated 3 times. If the 3rd time, it is still present, the transmitter is cut for good.

Off/On

RF PRESENT (TX.RFPRESENT) – read *

This parameter indicates whether RF is present at a level superior to the threshold set by the command TX.RFPRESENT.MIN (0 by default). When not present (status=off), no alarm is triggered.

Off/On

SFN (CONF.SFN.STATE) – read/write *

Enable or disable the SFN function with this parameter. The SFN (Single Frequency Network) is a broadcast network where several transmitters simultaneously transmit the same signal over the same frequency channel. It uses the 10 MHz input to synchronize the RF subcarrier and the modulation. Before enabling SFN, it is essential to conduct a study to determine its feasibility; if feasible, SNF requires a proper installation. Use AES inputs and adjust the transmitter power accordingly.

Off/On

SFN DELAY (CONF.SFN.DELAY) – read/write *

With this parameter set the SFN delay. The SFN delay makes it possible to compensate audio transmit time in the network. This delay has to be set in the field depending on readings computed in the coverage area. It is set in 1.25 µs increments. The actual delay is then read and an offset between the set delay and the read delay leads to an SFN alarm (loss of synchronization).

From 0 to 5000000.00 µs

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10 MHz OPERATION (CONF.10MOPE) - read/write *

With this parameter set the operating mode of the 10 MHz input. In manual mode, the transmitter uses the internal 10 MHz reference. In auto mode, it uses an external 10 MHz reference when one is detected; when none is detected, it switches back to the internal 10 MHz reference.

Manu/Auto

5.5. SmartFM parameters

These parameters are available as:

Front panel	SMARTFM menu	see section 6.3.5
Serial commands	MEAS, TX, CONF, STAT	see sections 7.2.2, 7.2.3, 7.2.4 and 7.2.9
Embedded web site	Transmitter/Main/SmartFM page	see section 9.4.2

** Parameters followed by a star (*) are not available on the front panel.*

ⓘ *SmartFM is a worldwide patented technology developed by WorldCast Systems.*

ⓘ *SmartFM is an option. If the license is not present, the function cannot be enabled.*

SmartFM is the first artificial intelligence dedicated to the FM radio listener experience. SmartFM can:

- Reduce FM Operating Costs (Opex)
  - Reduces electrical consumption by up to 40%
  - Reduces cooling costs by up to 45%
  - Increases transmitter lifespan
  - Reduces maintenance
- Reduce CO_2 emisions
  - Measurable and logged benefits
  - Guaranteed return-on-investment

SmartFM ACTIVATION (CONF.SFM.STATE) – read/write

With this parameter, enable/disable the SmartFM function.

Off/On

SmartFM STATUS (STAT.SFM.ACT) – read

This parameter indicates whether SmartFM is enabled. It may differ from the Activation parameter, if for instance, the function is enabled but there are no SmartFM credits left.

Off/On

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SmartFM STRATEGY / MODE (CONF.SFM.MODE) – read/write

Five broadcasting strategies are available to meet the distinct needs of broadcasters. These strategies may improve the listening experience for the most sensitive audio signals, especially at coverage limits, dramatically reduce OPEX without affecting the listening experience, or both.

Standard: This strategy improves the reception quality while allowing significant savings.
Standard +: This strategy increases the "standard" savings.
Overlap: this strategy leads to significant savings while protecting from adjacent channels .
Boost: This strategy improves the reception quality while controlling the average power. Make sure your transmitter can reach the set power +10%.
Extreme: This strategy achieves extreme savings. As minimum impact on the reception quality may be observed, be careful while using this configuration.

MINIUMUM RATE (STAT.SFM.MIN) – read *

Minimum rate applied to the set power. This rate is contingent on the selected strategy.

From 25 to 125 %

MAXIMUM RATE (STAT.SFM.MAX) – read *

Maximum rate applied to the set power. This rate is contingent on the selected strategy.

From 25 to 125 %

CURRENT RATE (MEAS.SFM) – read *

Rate applied to the set power. It varies between the min rate and the max rate, and depends on the current program.

From 25 to 125 %

SmartFM / SFM POWER (TX.SFM) – read *

SmartFM set power based on the transmitter set power and the applied rate. This value is visible on the Transmitter/Main/Parameters page of the embedded web site.

SAVINGS (TX.PCONS.SAVE) – read *

This parameter gives the number of kWh saved since SmartFM was first used (on web page and front panel), or over the last 10 seconds (with serial command). On the web interface, the conversion rate and the currency symbol can be set (System/Product/Configuration page) to display this parameter as cash value.

BOOST (TX.PFWD.BOOST) – read *

This parameter gives the boost in Wh since SmartFM was first used (on web page and front panel), or instantaneously (with serial command).

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5.6. nput switch parameters

These parameters are available as:

Front panel	INPUT SWITCH menu	see section 6.3.7
Serial commands	INPUT and CONF	see sections 7.2.6 and 7.2.4
Engi PC application	Input Switch page	see section 8.2.2
Embedded web site	Transmitter/Input Select pages	see section 9.4.4

MODE

With this parameter, choose whether audio source selection is done manually or automatically. In manual mode, the user selected audio source is used regardless of the state of the audio source. In auto mode, the effective audio source depends directly on the switching configuration and on the channels selected as Main or as Backup (1, 2 or 3).

MANU or AUTO

MAIN

With this parameter, select the main audio source.

LINE1, LINE2, MPX1, MPX2, PLAYER or GENE

SWITCHING

Switch management is handled differently depending on the interface.

BACKUP 1 / BACKUP 2 / BACKUP 3 (Front panel)

With these parameters, select the audio sources which the transmitter will switch to in case of issue.

LINE1, LINE2, MPX1, MPX2, PLAYER or GENE

PRIORITY (serial commands, Engi, web site)

With these parameters, set the level of priority for each input and thus configure the selection order for the various audio sources.

From 1 to 7, 7 being the highest level of priority

If there is no audio, neither on the main source nor on the backup sources (or regardless of the priority level), the transmitter will remain on (or switch back to) the main source.

LINE 1 or 2 / MPX / PLAYER parameters

These parameters are specifically available as INPUT.LINE1.SW / INPUT.LINE2.SW / INPUT.MPX.SW / INPUT.PLAYER.SW serial commands (see section 7.2.5).

THRESHOLD (INPUT.xx.SW.THRESH) – read/write

With this parameter, set the silence threshold level on the selected channel. In dBr when units are in relative mode; in dBFS or dBu when units are in absolute mode (see definition of modes section 5.15).

From -90 to 0 dBr

SILENCE (INPUT.xx.SW.SILENCE) – read/write

With this parameter, select the channel (L / R / L or R / L and R) on which silence detection must be performed (not available on the MPX sub-menus).

L, R, ANY or BOTH

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DELAY (INPUT.xx.SW.DELAY) – read/write

With this parameter, set the switching delay in seconds when audio loss occurs.

From 1 to 120 s

BACK DELAY (INPUT.xx.SW.BACKDELAY) – read/write

With this parameter, set the delay before returning to the highest priority channel, in seconds.

From 0 to 30 s

CUSTOM AUDIO ALARM (CONF.AUDIO.LOSS.SELECT.xx) – read/write

With this parameter, set whether a loss of audio on this input should trigger an alarm.

Off/On

CUSTOM AUDIO ALARM TRIGGER (CONF.AUDIO.LOSS.TRIG) – read/write

With this parameter, set the type of alarm triggered by a loss of audio: none, warning or fault. If the custom alarm is enabled on a given input and the triggering type is NONE, in case of loss of audio, the transmitter will neither be in fault nor in warning, however, the alarm will be triggered. This behavior allows shutting off the RF on loss of audio without having the transmitter in alarm.

NONE, WARNING, FAULT

CROSSFADE (CONF.CROSSFADE) – read/write

With this parameter, set the duration of the crossfade to switch from a backup audio channel back to a channel with a higher priority level in seconds. Recommended value: 0 to disable the function, 1 for optimal results.

From 0 to 25.5 s

FADE-IN (CONF.FADEIN) – read/write

With this parameter, set the time it will take for the volume to reach its maximum level when a backup audio channel goes on air, in seconds. Recommended value: 0 to disable the function, 1 for optimal results.

From 0 to 25.5 s

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5.7. Line 1 (ANA) parameters

These parameters are available as:

Front panel	LINE 1 menu	see section 6.3.8
Serial commands	INPUT.LINE1	see section 7.2.6
Engi PC application	Audio Input page	see section 8.2.2
Embedded web site	Transmitter/Input Source/Line1 page	see section 9.4.5

PRESENCE (INPUT.LINE1.PRESENCE) – read only

This parameter indicates the presence of audio signal at the input: none, left, right or L&R.

NONE, L, R, L+R

LEVEL (INPUT.LINE1.LEVEL) – read/write

This parameter is the max audio peak in dBu that can come from the transmitter on the LINE1 input. For example, if the audio peak from the source is +6 dBu, this parameter must be set to +6 dBu for optimal operation. If you do not know the audio source level, you may use an audio analyzer or display first level measurements on the front panel to read the LINE1 LEVEL. Be aware that if the level is poorly set the deviation may become too low or too high. This level is also called nominal level, i.e. the level producing the deviation as set in the Modulation menu.

From -18 dBu to +18 dBu

DRIVE (INPUT.LINE1.DRIVE) – read/write

With this parameter, you can slightly compensate the input audio level. It directly affects the final deviation. A negative value decreases the deviation; a positive value can increase the deviation and/or cause the MPX hard clipper to be used (if enabled) which in turn may lead to audio distortion. We recommend you leave it at 0 dB.

From -6 dB to +6 dB

RIGHT TRIM (INPUT.LINE1.TRIM) – read/write

With this parameter, you can correct the balance between the Left and Right channels. However, it is better to look for and correct the cause of a lack of balance (before the transmitter) rather than correcting it at this stage. A positive value increases the Right channel; a negative value decreases the Right channel level. It is best to leave it at 0 dB.

From -3 dB to +3 dB

FILTER (INPUT.LINE1.FLT) – read/write

This parameter is crucial: it set the low-pass filter applied on the audio input. The FM bandwidth is limited to 15 kHz, so **the filter must be set to 15 kHz for the FM**. Digital technology and the quality of the internal stereo encoder make it possible to set the filter at 16 or 17 kHz while maintaining an acceptable pilot protection. Select 0 kHz to disable the filter: this solution can be used in mono operation (in stereo operation, the incidence on the MPX signal and its sub-carrier would be too great) or when a 15 kHz filter is already used upstream as with an FM processor for instance. In this specific situation, you may also use 2 filters, the standard 15 kHz standard filter with the external processor, plus the 16 kHz transmitter filter. The listeners will hear the processor's filter; the internal filter will take the relay in case of issue with the processor.

0, 15, 16 or 17 kHz

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PREACC (INPUT.LINE1.PREAC) – read/write

With this parameter, set the pre-emphasis. Select 0 µs is the audio signal is pre-emphasized before getting to the transmitter. Otherwise, select according to the country: 50 µs in Europe, 75 µs in the USA.

0, 50 or 75 µs

5.8. Line 2 (AES) parameters

These parameters are available as:

Front panel	LINE 2 menu	see section 6.3.8
Serial commands	INPUT.LINE2	see section 7.2.6
Engi PC application	Audio Input page	see section 8.2.2
Embedded web site	Transmitter/Input Source/Line2 page	see section 9.4.5

They are identical to LINE1 parameters, except for the level, and the Sampling and No Sync parameters which only applies to an AES stream.

LEVEL (INPUT.LINE2.LEVEL) – read/write

This parameter is the max audio peak in dBu that can come from the transmitter on the LINE2 input. For example, if the audio peak from the source is -4 dBFS, this parameter must be set to -4 dBFS for optimal operation. If you do not know the audio source level, you may use an audio analyzer or display first level measurements on the front panel to read the LINE2 LEVEL. Be aware that if the level is poorly set the deviation may become too low or too high. This level is also called nominal level, i.e. the level producing the deviation as set in the Modulation menu.

From -20 dBFS to 0 dBFS

SAMPLING (INPUT.LINE1.GET_SAMPLING) – read

This parameter reads the sampling rate in Hz.

From 0 to 200000 Hz

NO SYNC (INPUT.LINE2.NO.SYNC) – read/write

With this parameter, set whether the loss of synchronization on the AES input should lead to a switch of channel. On the website, it is the “Check sync” parameter of the Transmitter/Input Select/Silence Detector page.

Off/On

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5.9. MPX parameters

MPX1 / MPX2 / MPX3 / MPX4

MPX3 and MPX4 are available when line 2 is set as a digital MPX input (this operation must be done with serial command (SYS.DIGMPX) or on the Product configuration page of the web site).

These parameters are available as:

Front panel	MPX ANA / MPX DIG menus	see sections 6.3.9 and 6.3.10
Serial commands	INPUT.MPX1 / INPUT.MPX2	see sections 7.2.6
Engi PC application	Audio Input page	see section 8.2.2
Embedded web site	Transmitter/Input Source/MPX page	see section 9.4.5

PRESENCE (INPUT.MPXn.PRESENCE) – read only

This parameter gives the composition of the signal on the MPXn input.

MO (mono), MO+R (mono+RDS), MO+R+S (mono+RDS+SCA), ST (stereo), ST+R (stereo+RDS) or ST+R+S (stereo+RDS+SCA)

LEVEL (INPUT.MPXn.LEVEL) – read/write

This parameter is the max audio peak in dBu that can come from the transmitter on the MPX input. For example, if the audio peak from the source is +6 dBu, this parameter must be set to +6 dBu for optimal operation. If you do not know the audio source level, you may use an audio analyzer or display first level measurements on the front panel to read the MPXn LEVEL. Be aware that if the level is poorly set the deviation may become too low or too high. This level is also called nominal level, i.e. the level producing the deviation as set in the Modulation menu.

From -18 dBu to +18 dBu

DRIVE (INPUT.MPXn.DRIVE) – read/write

With this parameter, you can slightly compensate the input audio level. It directly affects the final deviation. A negative value decreases the deviation; a positive value can increase the deviation and/or cause the MPX hard clipper to be used (if enabled) which in turn may lead to audio distortion. We recommend you leave it at 0 dB.

From -6 dB to +6 dB

RMS (INPUT.MPXn.RMS) – read only

This parameter indicates the average value of the transmitted signal's excursion in kHz.

From -150 to +150 kHz

PEAK (INPUT.MPXn.PEAK) – read only

This parameter indicates the peak value of the transmitted signal's excursion in kHz.

From -150 to +150 kHz

SAMPLING (INPUT.LINE1.GET_SAMPLING) – read

This parameter reads the sampling rate in Hz.

From 0 to 200000 Hz

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5.10. Player parameters (audio backup)

These parameters are available as:

Front panel	PLAYER menu	see section 6.3.8
Serial commands	INPUT.PLAYER	see section 7.2.6
Engi PC application	Audio Input page	see section 8.2.2
Embedded web site	Transmitter/Input Source/Audio backup page	see section 9.4.5

They are identical to LINE2 parameters.

5.11. Audio generator parameters

These parameters are available as:

Front panel	AUDIO GENE menu	see section 6.3.11
Serial commands	INPUT.AUDIOGEN	see section 7.2.6
Engi PC application	Audio Input page	see section 8.2.2
Embedded web site	Transmitter/Input Source/Generator page	see section 9.4.5

The audio generator is a multiplex channel and is therefore not affected by the stereo encoder parameters.

STATE (INPUT.AUDIOGEN.STATE) – read/write

With this parameter, set the type of MPX signal generated by the internal generator.

OFF, PILOT, L, R, L+R (mono) or L-R (stereo)

PREAC (INPUT.AUDIOGEN.PREAC) – read/write

With this parameter, set the pre-emphasis. Select 0 µs is the audio signal is pre-emphasized before getting to the transmitter. Otherwise, select according to the country: 50 µs in Europe, 75 µs in the USA.

0, 50 or 75 µs

LEVEL (INPUT.AUDIOGEN.LEVEL) – read/write

With this parameter, set the internal generator audio level.

From -100.00 to 12.00 dBFS

FREQ (INPUT.AUDIOGEN.FREQ) – read/write

With this parameter, set the internal generator audio frequency.

From 0 to 100000.00 Hz

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5.12. Modulation parameters

These parameters are available as:

Front panel *	MODULATION menu	see section 6.3.12
Serial commands	MEAS.DEV and CONF	see sections 7.2.2 and 7.2.4
Engi PC application	Modulator page	see section 8.2.2
Embedded web site	Transmitter/Modulation pages	see section 9.4.3

** Parameters followed by a star (*) are not available on the front panel.*

PEAK (MEAS.DEV.RMS) – read only

This parameter indicates the current value of the transmitted signal's excursion in kHz.

From -150 to +150 kHz

DEV MPX (CONF.DEV.MPX) – read/write

With this parameter, set the maximum MPX deviation in kHz generated when the audio source is at the nominal level (the nominal level is set with the LEVEL parameter of the menus: LINE1, LINE2, MPX1 or MPX2). It is often set at 75 kHz but this value may vary according to the country and relevant regulatory authorities. To ensure the sub-carrier levels remain stable, this parameter directly changes the audio deviation.

From 0 to 150.00 kHz

DEV AUDIO (CONF.DEV.AUDIO) – read/write

With this parameter, set the maximum audio deviation in kHz generated when the audio source is at the nominal level (the nominal level is set with the LEVEL parameter of the menus: LINE1, LINE2, MPX1 or MPX2). The audio deviation is set automatically when the MPX deviation parameter is set; however, it is possible to set the audio deviation rather than the MPX deviation. Increasing or decreasing the audio deviation affects the total deviation and thus automatically adjusts the MPX deviation. Make sure to avoid overmodulation. In case of loss of a sub-carrier (RDS or SCA) the deviation which was previously allocated to the sub-carrier is allocated to the audio.

From 0 to 150.00 kHz

DEV PILOT (CONF.DEV.PILOT) – read/write

With this parameter, set the 19 kHz pilot deviation. For countries modulating at 75 kHz, the pilot deviation should be 10% of the total deviation, i.e. 7.5 kHz without RDS or 7.1 kHz if RDS is used.

From 0 to 25.5 kHz

DEV RDS (CONF.DEV.RDS) – read/write

With this parameter, set the RDS sub-carrier deviation. The most widely used value is 4 kHz. In case of loss of RDS, this deviation is allocated to the audio.

From 0 to 25.5 kHz

DEV SCA (CONF.DEV.SCA) – read/write

With this parameter, set the SCA deviation (auxiliary sub-carrier other than RDS), as needed. In case of loss of SCA, this deviation is allocated to the audio.

From 0 to 25.5 kHz

Interaction between the various components according to the input type:

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In all cases described below, the transmitter configuration is as follows:

Audio = 67.5 kHz

Pilot = 7.5 kHz

RDS = 4.0 kHz.

In the case of audio inputs (analog or AES), the set MPX represents the total of audio, pilot and RDS. If the RDS is disabled, the audio is automatically adjusted with +4 kHz.

Ex 1: set MPX = 75 kHz

Pilot = 7.5 kHz

RDS = 4.0 kHz.

If the RDS is enabled: Audio = 63.5 kHz

Pilot = 7.5 kHz

RDS = 4.0 kHz

If the RDS is disabled: Audio = 63.5 + 4 = 67.5 kHz

Pilot = 7.5 kHz

In the case of MPX inputs, if the RDS is disabled, **the audio cannot be adjusted**.

Ex 2: inject stereo MPX + RDS with:

Audio = 63.5 kHz

Pilot = 7.5 kHz

RDS = 4.0 kHz.

If the RDS is disabled: Audio = 63.5 kHz

Pilot = 7.5 kHz

RDS on the MPX input: Audio = 63.5 kHz

Pilot = 7.5 kHz

RDS = 4.0 kHz

With internal RDS: Audio = 63.5 kHz

Pilot = 7.5 kHz

RDS = 4.0 kHz

Ex 3: inject stereo MPX with:

Audio = 67.5 kHz

Pilot = 7.5 kHz

If the RDS is disabled: Audio = 67.5 kHz

Pilot = 7.5 kHz

With internal RDS: Audio = 67.5 kHz

Pilot = 7.5 kHz

RDS = 4.0 kHz

! ***The total modulation 67.5+7.5+4.0 = 79 kHz is too high!***

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FSK – Frequency-Shift Keying *

The FSK is a frequency modulation scheme in which digital information is transmitted through discrete frequency changes of a carrier wave. Data is sent at the beginning of each hour. To use FSK, set the four following parameters:

- identification (CONF.FSK.ID): call sign to transmit in Morse code, character string – empty by default.
- number of repetition (CONF.FSK.REP) from 0 to 255 – 0 by default.
- frequency shift (CONF.FSK.SHIFT) in kHz from 5 to 25 and -25 to -5 – 10 by default.
- speed of transmission (CONF.FSK.SPEED) in WPM from 0 to 25 – 5 by default.

5.13. Stereo Encoder parameters

These parameters are available as:

Front panel	STEREO ENCODER menu	see section 6.3.13
Serial commands	CODER and CONF	see sections 7.2.7 and 7.2.4
Engi PC application	Modulator page	see section 8.2.2
Embedded web site	Transmitter/Modulation pages	see section 9.4.3

MO/ST (CODER.MOST) – read/write

With this parameter, set the stereo generator in mono or stereo mode. For mono, there are 3 options: Left channel broadcast in mono (Mono_L), right channel broadcast in mono (Mono_R), the sum Left+Right broadcast in mono (Mono). Otherwise left and right channels are broadcasted in stereo.

STEREO, MONO, MONO_L or MONO_R

AUDIO CH (CODER.SELECT.AUDIO) – read only

This parameter indicates the channel used by the modulator for the audio, as set with the INPUT.SELECT menu.

NONE, AUTO, LINE1, LINE2, MPX1, MPX2, PLAYER or GENE

PHI 19k (CONF.PHASE.PILOT) – read/write

With this parameter, set the pilot sub-carrier phase. We recommend setting it at 0°.

De -180 à +180°

19k OUT LEVEL (CODER.19KOUT.LEVEL) – read/write

With this parameter, enable/disable the rear panel 19 kHz clock and set its output level. 0=off; between 1 and 7: set a level between 0.9 and 1.1 V peak-to-peak. 5 corresponds to 1 V.

From 0 to 8 V

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5.14. RDS / SCA encoder parameters

These parameters are available as:

Front panel	RDS / SCA ENCODER menu	see section 6.3.14
Serial commands	CODER and CONF	see sections 7.2.7 and 7.2.4
Engi PC application	Modulator page	see section 8.2.2
Embedded web site	Transmitter/Modulation pages	see section 9.4.3

RDS CH (CODER.CURRENT.RDS) – read only

This parameter indicates the channel used by the modulator for the RDS, as set with the RDS IN parameter.

NONE, MPX1, MPX2 or INTERNAL

RDS STATE (CONF. STATE.RDS) – read/write

With this parameter, enable or disable the RDS. When the RDS is enabled or disabled, the RDS deviation is automatically subtracted from or added to the audio deviation to maintain the same total deviation.

Off/On

RDS IN (CODER.SELECT.RDS) – read/write

With this parameter, set the RDS component source of the broadcast signal either with an external source or with the internal encoder. The AUTO mode selects the RDS source according to the current audio source. If the source is pure audio (LINE1 or LINE2), the transmitter uses the internal RDS; if the source is MPX1 (or MPX2), the transmitter uses the MPX1 (or MPX2) as RDS encoder. When selecting AUTO, the RDS source is updated when there is a switch of audio source. OFF disables the RDS.

MPX1, MPX2, INTERNAL, AUTO or OFF

The internal source can only be selected if the RDS option is present. Without the RDS option and if AUTO is selected: with the MPX1 or MPX2 source, their RDS component is used; with the LINE1 or LINE2 source, there is no RDS.

PHI RDS (CONF.PHASE.RDS) – read/write

With this parameter, set the RDS sub-carrier phase in relation to the pilot sub-carrier. We recommend setting it at 90°.

From -180 à to180°

SCA STATE (CONF. STATE.SCA) – read/write

With this parameter, enable or disable the SCA. When the SCA is enabled or disabled, the SCA deviation is automatically subtracted from or added to the audio deviation to maintain the same total deviation.

Off/On

SCA IN (CODER.SELECT.SCA) – read/write

With this parameter, set the SCA component source of the broadcast signal. The AUTO mode selects the SCA source according to the current audio source. If the source is MPX1 (or MPX2), the transmitter uses the MPX1 (or MPX2). When selecting AUTO, the SCA source is updated when there is a switch of audio source. OFF disables the SCA.

MPX1, MPX2, AUTO or OFF

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SmartFM RDS CORRECTION (CONF.DEV.RDS.COR) – read/write

With this parameter, enable SmartFM to optimize the modulation. We recommend you leave this parameter enabled.

Off/On

5.15. Sound process parameters

These parameters are available as:

Front panel	SOUND PROCESS menu	see section 6.3.15
Serial commands	CONF	see section 7.2.4
Engi PC application	AGC/Limiter page	see section 8.2.2
Embedded web site	Transmitter/Modulation/Sound Process page	see section 9.4.3 + chapter 10

Parameters specific to the 5 Band Sound Processor option are only available on the embedded web site. See chapter 10 for more details.

PRESET NAME (CONF.SP.PRESET.NAME) – read/write

With this parameter, select the current preset among set presets.

HARD CLIPPER STATE (CONF.STATE.CLIP) – read/write

This parameter enables or disables the clipper. It is recommended to leave it on to protect the transmitter.

Off/On

HARD CLIPPER DEV (CONF.DEV.CLIP) – read/write

With this parameter, set the MPX hard clipper to prevent any possibility of overmodulation on the modulator itself. This process is carried out digitally right before the RF generation, and is therefore enabled on all the inputs. If the deviation is greater than the configured value (in kHz), the MPX hard clipper is automatically enabled. Unlike FM limiters/clippers used in audio processing, this clipper cannot be used continuously for it generates a noticeable audio distortion. It is therefore best to set it at the maximum authorized deviation, plus a few kHz to ensure additional security, for instance, set it at 90 kHz for a 75 kHz nominal deviation.

From 0 to 200 kHz

MPX POWER LIMITER STATE (CONF.STATE.MPXPWR) – read/write

This parameter enables or disables the MPX Power Limiter processing stage Do not activate the MPX power reduction if no standard requires you to do it, it could have a negative impact on the sought after sound level. Default: off.

Off/On

MPX POWER LIMITER LEVEL (CONF.DEV.MPXPWR) – read/write

Set the maximum authorized MPX Power. Default value: 3 dB.

From -3 to -10 dB

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5.16. RDS parameters

These parameters are available as:

Front panel	RDS menu	see section 6.3.16
Serial commands	RDS	see section 7.2.8
Engi PC application	RDS page	see section 8.2.2
Embedded web site	RDS pages	see section 9.5

With the RDS option, configure up to 2 DSNs each with a main PSN. Among other things, the DSNs allow fast and easy changing of the encoder settings remotely.

The RDS is enabled with the RDS/SCA ENCODER parameters.

You may use any type of characters for RDS texts (static or dynamic PS, RT…). In remote mode, these characters will be properly displayed, but not in local mode: ie., the Web interface will show the actual text but not the front panel application.

CURRENT MAIN (RDS.DSN)

This parameter indicates the current DSN number.

MAIN DSN

PI (RDS.MAINDSN.PI) – read/write

With this parameter, set the PI code (Program Identifier) used by RDS receivers to identify the station while searching for a frequency using AF or EON-AF codes.

4-digit hexadecimal code

PS (RDS.MAINDSN.PS) – read/write

With this parameter, set the PS (Program Station)

8-digit code

PTY (RDS.MAINDSN.PTY) – read/write

With this parameter, set the PTY (Program Type). Select on 32 RDS or RDBS preset codes as given in the table below.

From 0 to 31

PTY code	RDS Programme type (EU)	RBDS Program type (USA)
0	No programme type or undefined	No program type or undefined
1	News	News
2	Current affairs	Information
3	Information	Sports
4	Sport	Talk
5	Education	Rock

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6	Drama	Classic Rock
7	Culture	Adult Hits
8	Science	Soft Rock
9	Varied	Top 40
10	Pop Music	Country
11	Rock Music	Oldies
12	M.O.R. Music	Soft
13	Light classical	Nostalgia
14	Serious classical	Jazz
15	Other Music	Classical
16	Weather	Rhythm and Blues
17	Finance	Soft Rhythm and Blues
18	Children's programmes	Language
19	Social Affairs	Religious Music
20	Religion	Religious Talk
21	Phone In	Personality
22	Travel	Public
23	Leisure	College
24	Jazz Music	Unassigned
25	Country Music	Unassigned
26	National Music	Unassigned
27	Oldies Music	Unassigned
28	Folk Music	Unassigned
29	Documentary	Weather
30	Alarm Test	Emergency Test
31	Alarm	Emergency

MS (RDS.MAINDSN.MS) – read/write

With this parameter, indicate whether the program is Music or Speech to automatically adjust the sound level of the RDS receiver.

0 (music) or 1 (speech)

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DI (RDS.MAINDSN.DI) – read/write

With this parameter, set the DI (Decoder Identification) which enables an RDS receiver's audio level to be adjusted according to the type of received audio (mono or stereo, static or dynamic PTY, compressed or not, with or without artificial head).

From 0 to 15, as indicated in the table below.

	Mono / Stereo	With / Without artificial head	Compressed / non compressed	static / dynamic PTY
0	mono	without	non	static
1	mono	without	non	dynamic
2	mono	without	compressed	static
3	mono	without	compressed	dynamic
4	mono	with	non	static
5	mono	with	non	dynamic
6	mono	with	compressed	static
7	mono	with	compressed	dynamic
8	stereo	without	non	static
9	stereo	without	non	dynamic
10	stereo	without	compressed	static
11	stereo	without	compressed	dynamic
12	stereo	with	non	static
13	stereo	with	non	dynamic
14	stereo	with	compressed	static
15	stereo	with	compressed	dynamic

TA/TP (RDS.MAINDSN.TATP / RDS.MAINDSN.TA / RDS.MAINDSN.TA) – read/write

With this parameter, enable or disable the TA (Traffic Announcement) / TP (Traffic Program). Enabling the TA instantaneously switches an RDS receiver onto road information reports; at the end of the report, the receiver will automatically go back to its former operating state. Enabling the TP shows RDS receivers that the allocated station is likely to broadcast road information. You may enable both the TA and the TP, the TP only or neither.

TATP, TP or OFF

AF (RDS.MAINDSN.AF) – read/write

With this parameter, set up to 25 alternative frequencies in MHz with the method A. A RDS receiver will shift to an alternative frequency when the set frequency is no longer properly received.

XX,XX, …,XX

RT (RDS.MAINDSN.RT) – read/write

With this parameter, display and set the radiotext, function which enables text messages to be broadcast in groups of 64 characters. RDS receiver can only benefit from this function if fitted with a specific display (home receivers, Smartphone mobile receivers).

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Dynamic RT (RDS.RT1.TEXT) – read/write

With this parameter, display and set the radiotext, enhanced with tags (see list of tags below). It is not stored in the transmitter's internal memory and will be lost upon restart.

To ensure compatibility with legacy systems, the command RT_TEXT has been created. It is identical to the command RDS.RT1.TEXT.

GROUP SEQUENCE / GS (RDS.MAINDSN.GS) – read/write

With this parameter, set the group sequence (32 max) which must include at least one group 0A.

On the web interface, you may enter a specific sequence, or use a preset sequence. The SmartFM button makes it possible to set a group sequence to be used for field measurements run with a SmartFM compatible monitoring or measurement unit (such as the AUDEMAT FM MC5).

XX,XX, …,XX

Parameters of the ALT DSN are identical to those of the MAIN DSN; for serial commands, use ALT instead of MAIN.

PS Scroll

When it is authorized, PS Scroll is often used in direct relation with the on air audio content. The information needs frequent updating, it therefore should be set so changes are automatically taken into account.

Two distinct cases are identified:

- PS Scroll setting: available with serial commands, the Engi application or with the web site.
- Dynamic data transmission: can only be done with the RDS console.

Setting

Commands are available to interface with any automation system generating the information. Their name can be configured to match the specific commands of the automation software application.

Category	RTplus classes	MP3 id3v2		Description
Item	ITEM.TITLE	TIT2	TITLE	Title of item
	ITEM.ALBUM	TALB	ALBUM	The collection name to which this track belongs
	ITEM.TRACKNUMBER	TRCK	TRACKNUM	Number of the current part of the current level
	ITEM.ARTIST	TPE1	ARTIST	A person or band/collective generally considered responsible for the work
	ITEM.COMPOSITION			A complete composition (mainly used in classical music)
	ITEM.MOVEMENT			A **movement** is a large division of a larger composition or musical form
	ITEM.CONDUCTOR	TPE3	CONDUCTOR	The artist(s) who performed the work. In classical music this would be the conductor, soloists
	ITEM.COMPOSER	TCOM	COMPOSER	Name of the original composer
	ITEM.BAND	TPE2	BAND	Band / orchestra / accompaniment / musician
	ITEM.COMMENT	COMM	COMMENT	Any comment related to the content
	ITEM.GENRE	TCON	CONTENTTYPE	The main genre of the audio or video; e.g. "classical", "ambient-house", "synthpop", "sci-fi", "drama", etc.
Info	INFO.NEWS			Headline
	INFO.NEWS.LOCAL			Local news.
	INFO.STOCKMARKET			Quote information
	INFO.SPORT			Result of a game, either as one tag "Bayern München : Borussia 5:5" or as 2 distinct tags
	INFO.LOTTERY			Lottery
	INFO.HOROSCOPE			Horoscope

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Category	RTplus classes	MP3 id3v2		Description
	INFO.DAILY_DIVERSION			Daily tip / diversion / joke ...
	INFO.HEALTH			Information about health: Allergy alarms ...
	INFO.EVENT			Info about an event
	INFO.SZENE			Information about scene (Hot locations to be, ...)
	INFO.CINEMA			Information about movies in cinema
	INFO.TV			Information about TV-movies
	INFO.DATE_TIME			Information about date and time (Client to chose between date and time)
	INFO.WEATHER			Information about weather
	INFO.ALARM			An alarm information, typically an official alarm send out while the alarm flag is set
	INFO.ADVERTISEMENT			Info about an advertisement. May be in parallel to an audio advertisements
	INFO.OTHER			Other Information: Not especially specified
Program	STATIONNAME.LONG			Name describing the radio station
	PROGRAM.NOW			EPG info program now
	PROGRAM.NEXT			EPG info program next
	PROGRAM.PART			Part of the current radio show: E.g. one of several parts of the PROGRAM.NOW
	PROGRAM.HOST			Name of the host of the radio show
	PROGRAM.EDITORIAL_STAFF			
	PROGRAM.RADIO			Information about radio shows: A link towards another frequency with other content (NOT AF list) May be one tag (keyword##frequency) or two distinctive tags
	PROGRAM.HOMEPAGE	WORS	WWWRADIOPAGE	Link to radio station homepage
Interactivity	PHONE.HOTLINE			The telephone number of the radio stations hotline
	PHONE.STUDIO			The telephone number of the radio stations studio
	PHONE.OTHER			Name and telephone number: Either as one tag ("keyword##phone number") or as two distinct tags
	SMS.STUDIO			The sms number of the radio stations studio (to send directly a sms into the studio)
	SMS.OTHER			Name and sms number: Either as one tag ("keyword##sms number") or as two distinct tags
	EMAIL.HOTLINE			The email address of the radio stations hotline
	EMAIL.STUDIO			The email address of the radio stations studio
	EMAIL.OTHER			Name and email address: Either as one tag ("keyword##phone number") or as two distinct tags
	MMS.OTHER			Name and mms number: Either as one tag ("keyword##mms number") or as two distinct tags
	CHAT			chat content: send by users to a specific address and broadcasted by the Radio Station
	CHAT.CENTER			Address, where contributions to the chat shall be sent (may be url or sms)
	VOTE.QUESTION			A question (typically binary) which can be answered by "yes" or "no" or "1" or "2"
	VOTE.CENTER			url or sms number to send your answer to

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Descriptor	PLACE			Descriptor will always be the second RT tag in a message. And will describe the RT tag 1 in more detail
	APPOINTMENT			Adds info about date and time
	HOTLINE			Hotline number to call to get more info
	IDENTIFIER	TSRC	ISRC	Can identify any tag in RT1. For music it is the: International Standard Recording Code (http://www.ifpi.org/isrc/)
	PURCHASE	WPAY	WWWPAYMENT	Address where item can be purchased. Address can be an url or a sms-number
	GET_DATA			Retrieves either via a sms or url-link more data about tag in RT1. (Info request via Point to Point - unicast)

Six lines of PS Scroll can be configured. For each, set:

- **Text** (RDS.PS*n*.TEXT)**:** Text may include dynamic data (<ITEM….>, <INFO…>…) that will only be sent if filled in, and for ITEM type fields if the validity time frame is correct.
- **Repetition** (RDS.PS*n*.REP): The encoder will repeat the line before sending the next one (max: 16 times). If repetition is set between 1 and 16 for only one of the enabled strings, this one string will be sent indefinitely*. If repetition is set 0 for all the enabled strings, the static PS is sent. If the repetition for several enabled strings is set between 1 and 16, the sequence of these strings will be sent indefinitely*.
- **Enabled** (RDS.PS*n*.EN): Check the box for the line to be sent.
- **Center** (RDS.PS*n*.CENTER)**:** When scrolling is done word by word, the encoder may center each word in the receiver screen. Only applicable when 'Word' is the chosen increment
- **Increment** (RDS.PS*n*.INCREMENT)**:** Set the number of scrolling characters, from 1 to 8. Scrolling may be done by word (value 0). In that case, the encoder will detect whole words (identifiable delimiters are: ' ', '-', ','), and fit as many whole words as possible on each screen.
- **Truncated** (RDS.PS*n*.TRUNCATE)**:** When scrolling is done word by word, the encoder truncates words longer than the display screen (longer than 8 characters). Only applicable when 'Word' is the chosen increment.
- **Delay** (RDS.PS*n*.DELAY)**:** Time laps between 2 consecutive screens. When scrolling by letter, time laps between 2 characters.

Example:

```
RDS.PS1.TEXT = Now playing <ITEM.TITLE> by <ITEM.ARTIST>
RDS.PS1.EN = ON
RDS.PS1.REP = 1
RDS.PS1.TEXT = You're listening to <LONGNAME>
RDS.PS1.EN = ON
RDS.PS1.REP = 2
```

To ensure compatibility with legacy systems, the command PS_TEXT has been created. It is identical to the command RDS.PS1.TEXT.

Sending dynamic data

Default port for the RDS console is port 2000. It is set on the System/Communication/Network page.

To send dynamic data, open a Telnet session on port 2000.

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Example:

```
ARTISTNAME= Calexico
SONGTITLE= Miles from the Sea
STATIONNAMELONG= My Station
DURATION=3 :41
```

For 3 minutes and 41 seconds, the following sequence will be repeated:

Now playing Miles from the Sea by Calexico

You're listening to My Station

You're listening to My Station

** Strings including ITEM type data can only be sent if the duration is valid. In the above example, after 3 minutes and 41 seconds and with no new data, "You're listening to My Station" will be the only string sent.*

5.17. SD card parameters

The µSD card is an external storing device meant to mostly stay in place. Removing and setting it back triggers error messages visible on the embedded web site; it should therefore only be done during maintenance operation procedures. Unscrew the warranty warning shield before starting the removal procedure.

These parameters are available as:

Front panel	SD card menu	see section 6.3.23
Serial commands	SYS.SDC	see section 7.2.1

STATUS (SYS.SDC.PRES / SYS.SDC.STATE) – read

This parameter indicates if the µSD card is present and working properly (OK), not present, ready to be removed (UNMOUNT) or in fault.

OK, NOT PRES, UNMOUNT or FAULT

EJECT (SYS.SDC.EJECT) – read/write

This parameter requests the removal of the µSD card. Once the command is sent (YES), you must wait for the status to switch to UNMOUNT before the card is removed. This can only be done locally.

YES or NO

Card removal procedure

- Unscrew the warranty warning shield on the rear panel of the transmitter
- On the front panel, select the EJECT menu and set to YES
- Check the STATUS menu is UNMOUNT
- Physically remove the µSD card

5.18.

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Date and Time parameters

These parameters are available as:

Front panel	About/System menu	see section 6.3.23
Serial commands	SYS	see section 7.2.1
Engi PC application	System Page	see section 8.2.2
Embedded web site	System\Date\Date / Time	see section 9.7.4

DATE and TIME (SYS.DATE and SYS.TIME) – read/write

These parameters set the system date and time. To set the IP board date and time or to synchronize the IP board date and time with the system date and time, please refer to section 9.7.4.

5.19. System parameters

These parameters are available as:

Front panel	About/System menu	see section 6.3.23
Serial commands	SYS	see section 7.2.1
Engi PC application	Input Switch Page	see section 8.2.2
Embedded web site	System\Product\Configuration Page	see section 9.7.2

UNIT (SYS.UNIT) – read/write

This parameter sets the input mode for audio silence detection thresholds on all the inputs. With the Relative mode, level, drive and trim values are given in dBr. In Absolute mode, these values are given in dBu or dBFS and can be positive. Input levels affect set thresholds; thresholds applied to left and right, and to MPX1 and MPX2 can differ; however, only left and MPX1 threshold can be set. Default value: RELATIVE.

ABSOLUTE or RELATIVE

CLEAR CONFIG (SYS.RAZ)

This parameter reset the unit to default configuration.

! ***With an IP unit, wait for the IP connection to be available before shutting off the unit.***

! ***After a configuration reset, we recommend you check parameters meant to protect the transmitter: hard clipper activation/deviation and VSWR Trip.***

YES or NO

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5.20. Alarms

Current alarms are visible:

Front panel	Alarm menu	Only available when at least one alarm is active
Serial commands	Alarms	see section 7.2.5
Engi PC application	Main page & maintenance page	see section 8.2.2
Embedded web site	On applicable pages	

All alarms can either be ON or OFF.

10 MHz SWITCH ALARM (ALARM.10MSWITCH)

This alarm is on when there was a 10 MHz switch between the external source and the internal source.

1 dB ALARM (ALARM.1DB)

This alarm is on when the RF is ON and the current forward power is below the set 1 dB power threshold. The 1 dB can be user-set.

3 dB ALARM (ALARM.1DB)

This alarm is on when the RF is ON and the current forward power is below the set 3 dB power threshold. The 1 dB can be user-set.

AMBIENT TEMPERATURE ALARM (ALARM.AMB)

This alarm is on when the current ambient temperature is above the set maximum ambient temperature. The max ambient temperature can be user-set

LOW BATTERY ALARM (ALARM.BATLOW)

This alarm is on when the NVRAM battery's level is low. It means the NVRAM battery needs to be changed.

COMMUNICATION ALARM (ALARM.COMM)

This alarm is on when there is a communication fault with one of the units of the system. It only applies to Master unit of modular transmitters and 1+1 systems.

CURRENT 1 or 2 ALARM (ALARM.CUR1 / ALARM.CUR2)

This alarm is on when the MOSFET 1 or 2 current supplied by the PSU is over the max threshold.

EXCITER TEMPERATURE ALARM (ALARM.EXC_TEMP)

This alarm is on when the temperature of the exciter is higher than the max threshold.

FAN 1 or 2 ALARM (ALARM.FAN1 / ALARM.FAN2)

This alarm is on when the speed fan 1 or 2 is too slow. Fan 2 is only available on 1500 and 2000 W modules.

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CRITICAL ALARM (ALARM.FAULT)

This alarm is on when a critical alarm (3 dB, VSWR) is on.

HEATSINK 1 or 2 ALARM (ALARM.HEAT1 / ALARM.HEAT2)

This alarm is on when the heatsink temperature around MOSFET 1 or 2 is over the set heatsink max temperature. The heatsing max temperature can be user-set. MOSFET 2 is only available on 1500 and 2000 W modules.

FAULT ON INPUT ALARM (ALARM.INPUT_FAULT)

This alarm is on when there is a FAULT type alarm on an input.

INPUT SWITCH ALARM (ALARM.INPUTSWITCH)

This alarm is on when the current audio input does not correspond to the highest priority channel. It means the transmitter switched to a backup audio input.

INTERNAL TEMPERATURE ALARM (ALARM.INT_TEMP)

This alarm is on when the temperature of the internal sensor placed on PSU is higher than the max threshold.

LINE 1 or 2 ALARM (ALARM.LINE1 / ALARM.LINE2)

This alarm is on when there is no signal on the LINE 1 or 2 input. The silence detector considers there is no signal accordingly to various user-set parameters (see section 5.6).

LOSS OF AUDIO ALARM (ALARM.AUDIO.LOSS)

This alarm is on when there is a loss of audio on one of the inputs configured to trigger this alarm. Inputs are set on the Silence detector page of the embedded web site or with the commands CONF.AUDIO.LOSS.SELECT.***input***

µSD CARD ALARM (ALARM.LOGGING)

This alarm is on when two consecutive attempts to write on the µSD card have failed. The µSD card may be faulty.

MPX 1, 2, 3 or 4 ALARM (ALARM.MPX1 / ALARM.MPX2 / ALARM.MPX3 / ALARM.MPX4)

This alarm is on when there is no signal on the MPX 1, 2, 3 or 4 input. The silence detector considers there is no signal accordingly to various user-set parameters (see section 5.6).

OVERDRIVE ALARM (ALARM.OVDR)

This alarm is on when the input power on the MOSFET is too high.

INPUT POWER ALARM (ALARM.PIN)

This alarm is on when the input power on the MOSFET is too low. It may due to an issue on the modulator or the preamplifier board.

PLAYER ALARM (ALARM.PLAYER)

This alarm is on when no signal on the player (audio backup). The silence detector considers there is no signal accordingly to various user-set parameters (see section 5.6).

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PLL ALARM (ALARM.PLL)

This alarm is on when the PLL is locked. It may due to an issue on modulator board.

PRESSURE ALARM (ALARM.PRESSURE)

This alarm is on when the pressure of the internal sensor is higher than the max threshold.

PSU TEMPERATURE ALARM (ALARM.PSU_TEMP)

This alarm is on when the PSU temperature is higher than the max threshold.

RDS SWITCH ALARM (ALARM.RDSSWITCH)

This alarm is on when a RDS switch occurred (RDS auto mode only).

SMARTFM ALARM (ALARM.SFM)

This alarm is on when a SmartFM malfunction occurred.

SFN ALARM (ALARM.SFN)

This alarm is on when a loss of the external 10 MHz or a loss of the external 1 PPS or a difference between the set SFN delay and the measured SFN delay occurred. This alarm indicates a loss of SFN, not a loss of transmission.

POWER SUPPLY UNIT 1 or 2 ALARM (ALARM.SUPPLY1 / ALARM.SUPPLY1)

This alarm is on when there is an issue with PSU 1 or 2. PSU 2 is only available on 1500 and 2000 W modules.

TEMPERATURE THERMOCOUPLER 1 or 2 ALARM (ALARM.TEMP1 / ALARM.TEMP2)

This alarm is on when the heatsink temperature around MOSFET 1 or 2 is over the max temperature alarm (this threshold is factory set and cannot be modified). The RF is then cut off.

AUXILIARY VOLTAGE ALARM (ALARM.VOLT.AUX)

This alarm is on when the auxiliary voltage is offset by more than 10% of the set value.

VOLTAGE 1 or 2 ALARM (ALARM.VOLT1 / ALARM.VOLT2)

This alarm is on when the main PSU voltage reaching MOSFET 1 or 2 is offset by more than 10% of the expected value.

VSWR ALARM (ALARM.VSWR)

This alarm is on when the VSWR is over the VSWR alarm threshold. The threshold can be user-set.

WARNING ALARM (ALARM.WARN)

This alarm is on when a warning type alarm is on (fan, current, voltage, power supply, temperature, radiator, ambient temp).

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6. FRONT SCREEN USE

6.1. Overview

The transmitter can be entirely set using the front panel application.

For audio configuration you will use the following menus:

- **Input Switch**: to select the main audio source and the secondary audio sources and to set switching criteria between these sources.
- **Line1 / Line2 / MPX1 / MPX2 / Player / Audio Gene**: to set levels and processes for each source.
- **Modulation**: to set the deviation for each sub-carrier of the multiplex signal. In this menu you may also enable RDS and SCA.
- **Stereo Encoder**: to choose the content of stereo sub-carrier of the multiplex signal.
- **RDS/SCA Encoder**: to choose the content of the RDS and SCA sub-carrier of the multiplex signal.
- **RDS**: to set the RDS.

The default mode for the transmitter is the “Easy” mode: only menus required for basic configuration are available. For instance, the RDS menu mentioned above is not visible.

To display all menus, simply switch to “Expert” mode:

```
M E N U S
-> E A S Y
```

From the main screen, press the “Enter” key to display the menu and press the “-” key until you see the Easy menu. Then press the “Enter” key, “+” and “Enter” again to switch to Expert mode.

On the menu representations in the following pages:

- “Easy” menus are in green
- “Expert” menus are in orange

```
1   S T   E N C O D E R
 -> M O / S T : S T E R E O
```

```
1   S T   E N C O D E R
 A U D I O   C H : L I N E 2
```

On startup, the screen displays the name of the unit, its software release and its serial number.

6.2. Working principle

Press the Local button on the front panel: the transmitter must be in local mode before parameters can be modified.

Three keys allow you to browse through the menus: + − ENTER

With the + and − keys, go from one screen to the next or rather from one command to the next: if 2 commands are available on a single screen, press + twice to go to the next screen.

A command is selected when an arrow is visible before its name.

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Example:

```
1        F R E Q        P F W D
   ->    9 8 . 0 0        7 5 0
```

The frequency is selected

```
1        F R E Q        P F W D
         9 8 . 0 0     -> 7 5 0
```

The power is selected

The + and − keys are also used to adjust values after the edit mode has been enabled.

To adjust a value, set each character at a time. Text values are set from left to right; number values are set from right to left.

The ENTER button is used to:

- Access a lower level menu
- Enable the edit mode for parameters that can be modified
- Confirm a new value
- Return to the higher level menu.
- Return to the main screen when pressed for a few seconds.

Some menus include sub-menus. To make it easier to browse through the menus and locate the information, a small number is visible on the top left of the screen; it gives you the level of the menu you are viewing (1 or 2).

If a text string is longer than the screen, press the ENTER key to access the text string and + to scroll.

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6.3. Structure of the Ecreso FM menus

6.3.1. Overview

Alarm

Main measurements
- Frequency ⓘ
- Power ⓘ
- VSWR ⓘ
- Peak ⓘ
- Input source ⓘ
- Input level ⓘ
- Sound process status or preset name ⓘ

RF parameters
- Frequency
- Foward power ⓘ
- Power
- Reflected power ⓘ
- 3 dB threshold
- Max VSWR
- VSWR trip
- 1 dB threshold
- RF presence definition & state

SmartFM
- Status
- RDS Correction
- Mode
- Efficiency ⓘ
- SmartFM power ⓘ
- Savings ⓘ
- Boost ⓘ

Input switch
- Input select
  - Mode
  - Main input
  - Backup inputs
- Input selection
  - Threshold
  - Silence
  - Delay
  - Back delay
- Crossfade

Line 1 (id Line 2)
- Presence ⓘ
- Level
- Drive
- Right trim
- Filter
- Preaccentuation
- R & L levels
- Sampling

Line 2 (id Line 1)

MPX ANA
- MPX 1
  - Presence ⓘ
  - Level
  - Drive
  - RMS ⓘ
  - Peak ⓘ
- MPX 2 (id MPX 1)

MPX DIG
- MPX 3
  - Idem MPX ANA/MPX1
  - Sampling ⓘ
- MPX 4 (id MPX 3)

Player (id Line 1)

Audio Generator
- State
- Preaccentuation
- Level
- Frequency

Modulation
- RMS ⓘ
- Dev MPX
- Dev Audio
- Dev Pilot
- Dev RDS
- Dev SCA

Stereo encoder
- Mono/stereo
- Audio channel ⓘ
- Phase
- 19 kHz output level

RDS / SCA
- RDS channel ⓘ
- RDS input
- RDS backup state
- Phase RDS
- SCA channel ⓘ
- SCA input

Sound Process
- Configuration
  - Bypass
  - Preset name
  - Hard Cipper state
  - Hard Clipper dev
  - MPX power limiter state
  - MPX power limiter level
- Measures ⓘ
  - 1 min MPX power
  - 10 sec MPX power
  - Power attenuation
  - Clipper status

RDS
- Current PSN ⓘ
- Main DSN
  - PI
  - PTY
  - PS
  - MS
  - DI
  - TA/TP
  - AF
  - RadioText
  - Groups
- Alt DSN (id Main DSN)
- Clock Time
- CT offset

Network
- IP address
- Netmask
- Gateway
- Password reset

COM ports
- Local COM speed
- COM1 & 2 speed
- Local COM echo
- COM2 echo

Power supply
- Voltage1 /2 /3 /4 ⓘ
- Current1/2 /3 /4 ⓘ
- Standby mode

Temperature / Fan
- Ambiant temperature ⓘ
- Internal temperature ⓘ
- Fan 1 & 2 speed ⓘ
- Max ambiant temperature
- Max internal temperature
- Max PSU temperature

Time / Date
- Time & date setting

License
- Serial number
- Last key
- Current licenses
- Enable license
  - Generate key
- Disable license
  - Generate key

SD card
- SD card status
- SD card eject

About / System
- System type ⓘ
- System power capacity ⓘ
- Tx type ⓘ
- Tx power capacity ⓘ
- System name
- Tx name
- Software release ⓘ
- Hardware release ⓘ
- CAN id
- Calibration date ⓘ
- Serial number ⓘ
- Up date ⓘ
- Option list
- VSWR error type
- Audio threshold unit
- System reset

Easy / Expert Mode

Menus followed by ⓘ are read-only.
The Alarm menu only appears when at least one alarm is active.
Menu and menu items in orange are only visible in Expert mode.

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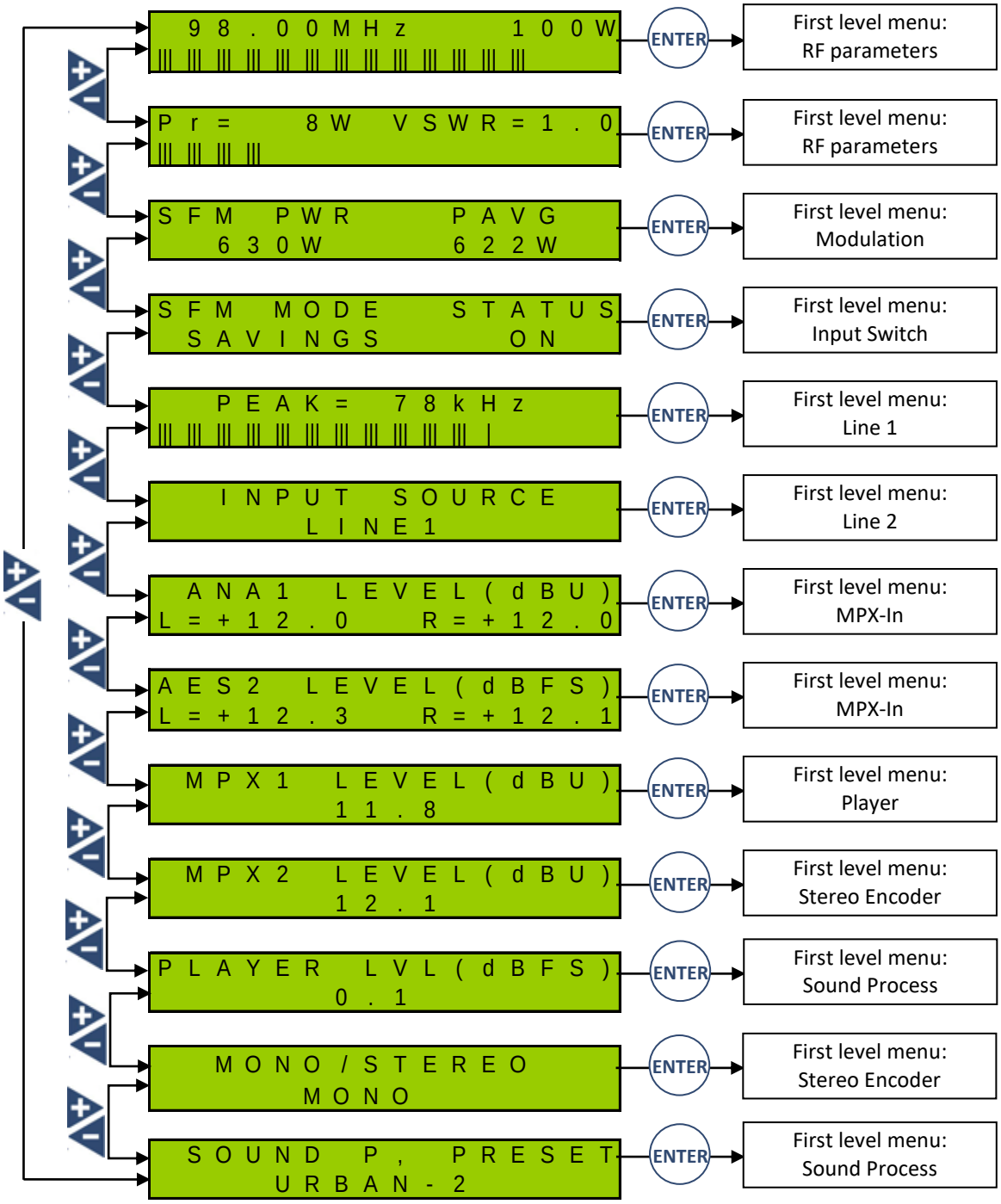
6.3.2. First level measurements

When there is no active alarm, the first available screens give an overview of the transmitter with readings of the main parameters.

These values are read-only; bargraphs may also be available.



See next page for first level menus

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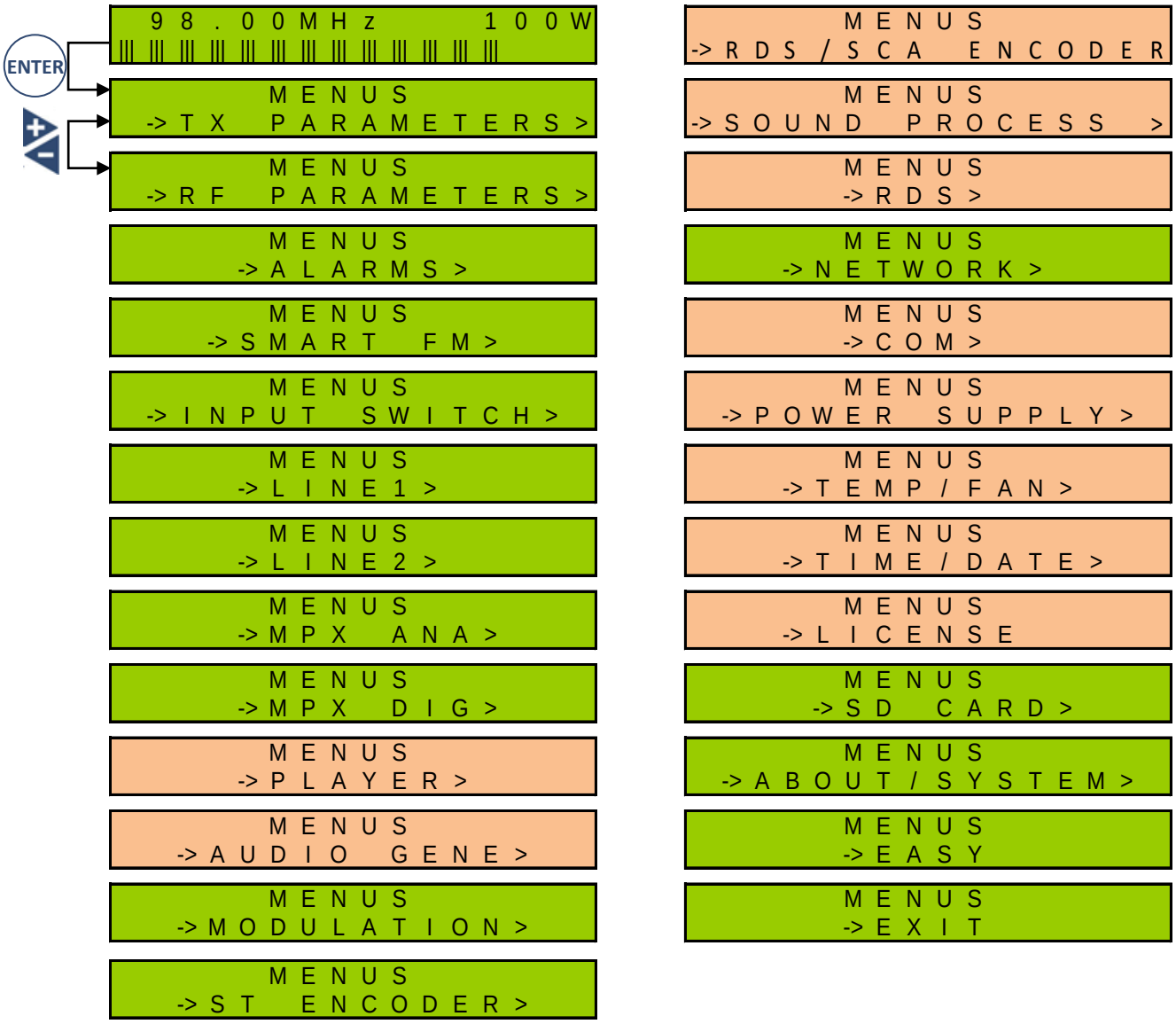
6.3.3. First level menus



From the main screen, presse the Enter key ENTER to display menus, then on the arrow keys + − to scroll through menus.

The arrow at the end of a second line indicates there is a sub-menu. Use the “Enter” button to access it.

Menus vary depending on options present on the transmitter, and on the state of the transmitter.

Menus in orange are only visible in Expert mode.

All menus are developed in the following pages.

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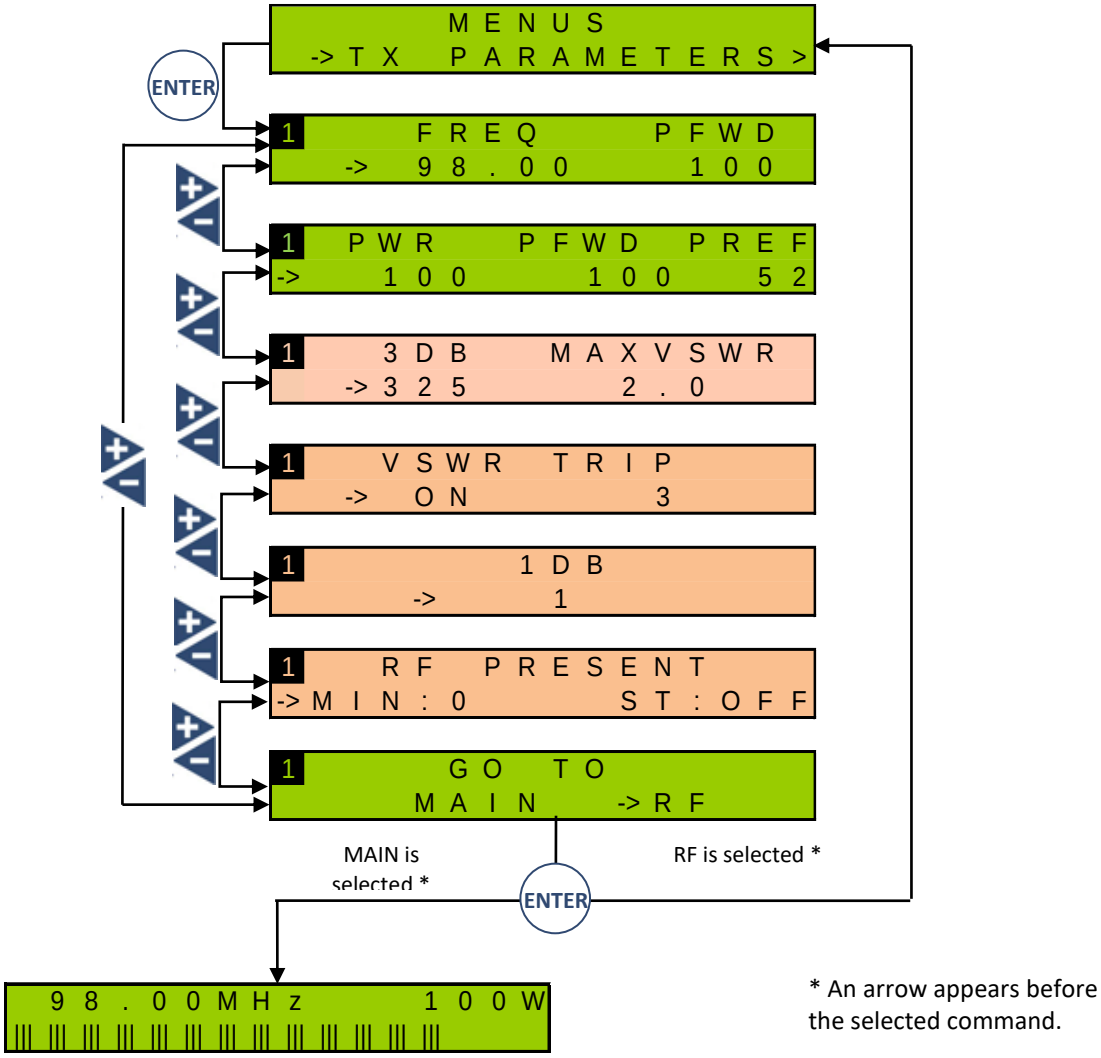
6.3.4. TX PARAMETERS / RF PARAMETERS Menus

Both menus include the same parameters but their scope is different:

- The TX PARAMETERS menu pertains to the whole transmitter
- The RF PARAMETERS menu pertains to the Helios FM 20/100W and Ecreso 100W only.

On a compact Ecreso FM, the TX PARAMETERS menu is not present.



Main measurement screen

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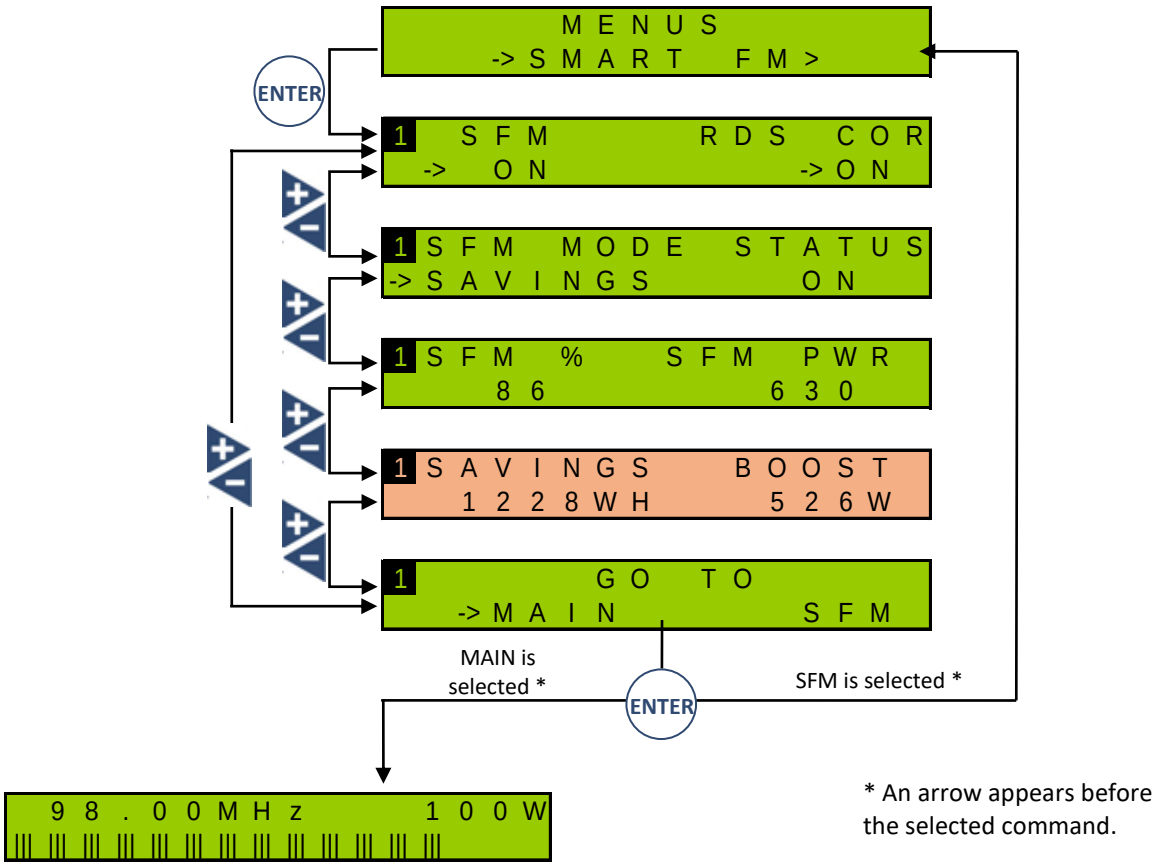
6.3.5. SmartFM Menu



Main measurement screen

6.3.6. ALARMS Menu

This read-only menu is only visible if alarms are present. It then displays one screen per current alarm: press the key ENTER the + key to scroll through them.

Alarms are described in section 7.2.5.

3 dB and VSWR alarms are not included in this list because their presence is first signaled with the front panel LED indicators.

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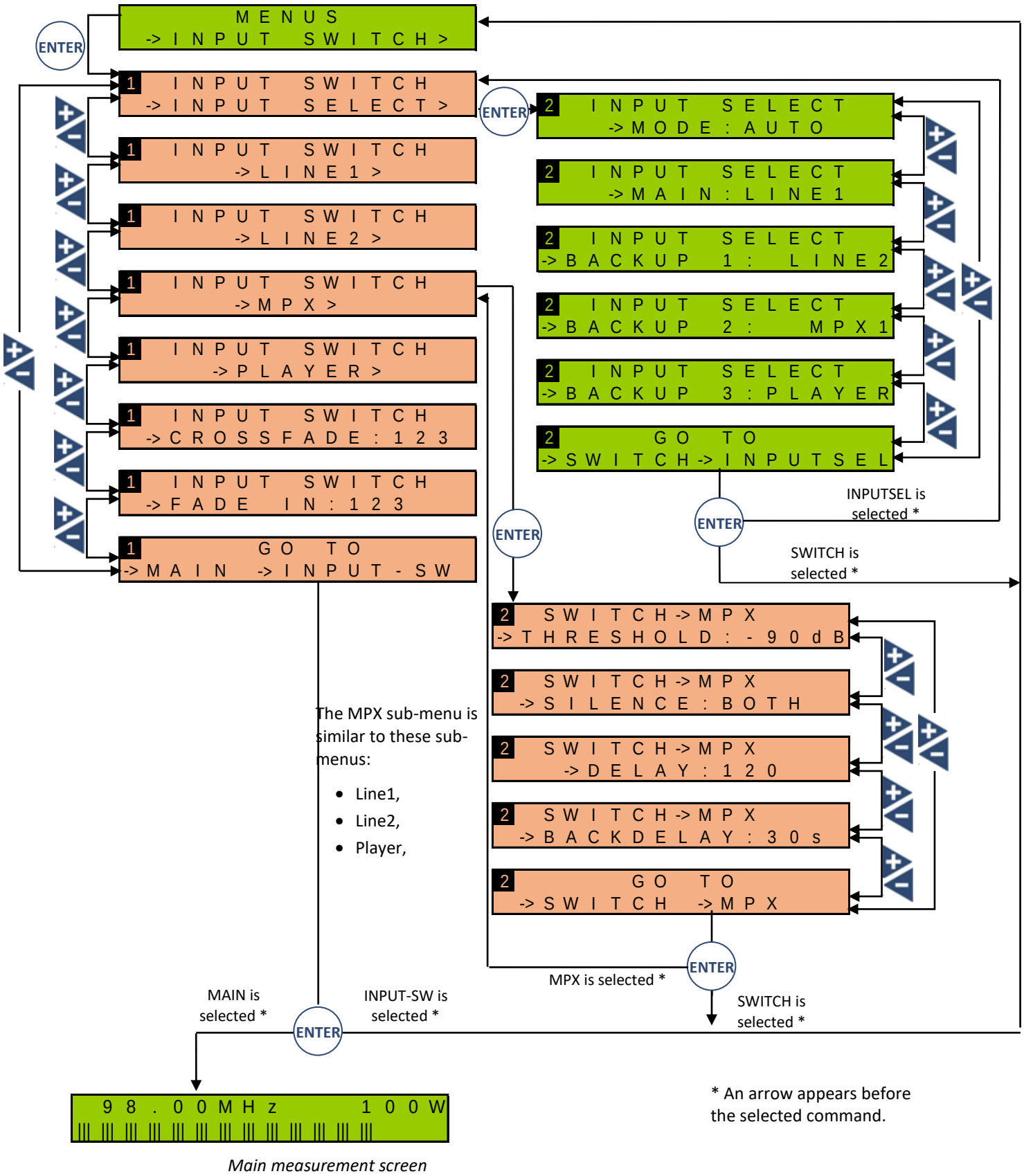
6.3.7. INPUT SWITCH Menu



Main measurement screen

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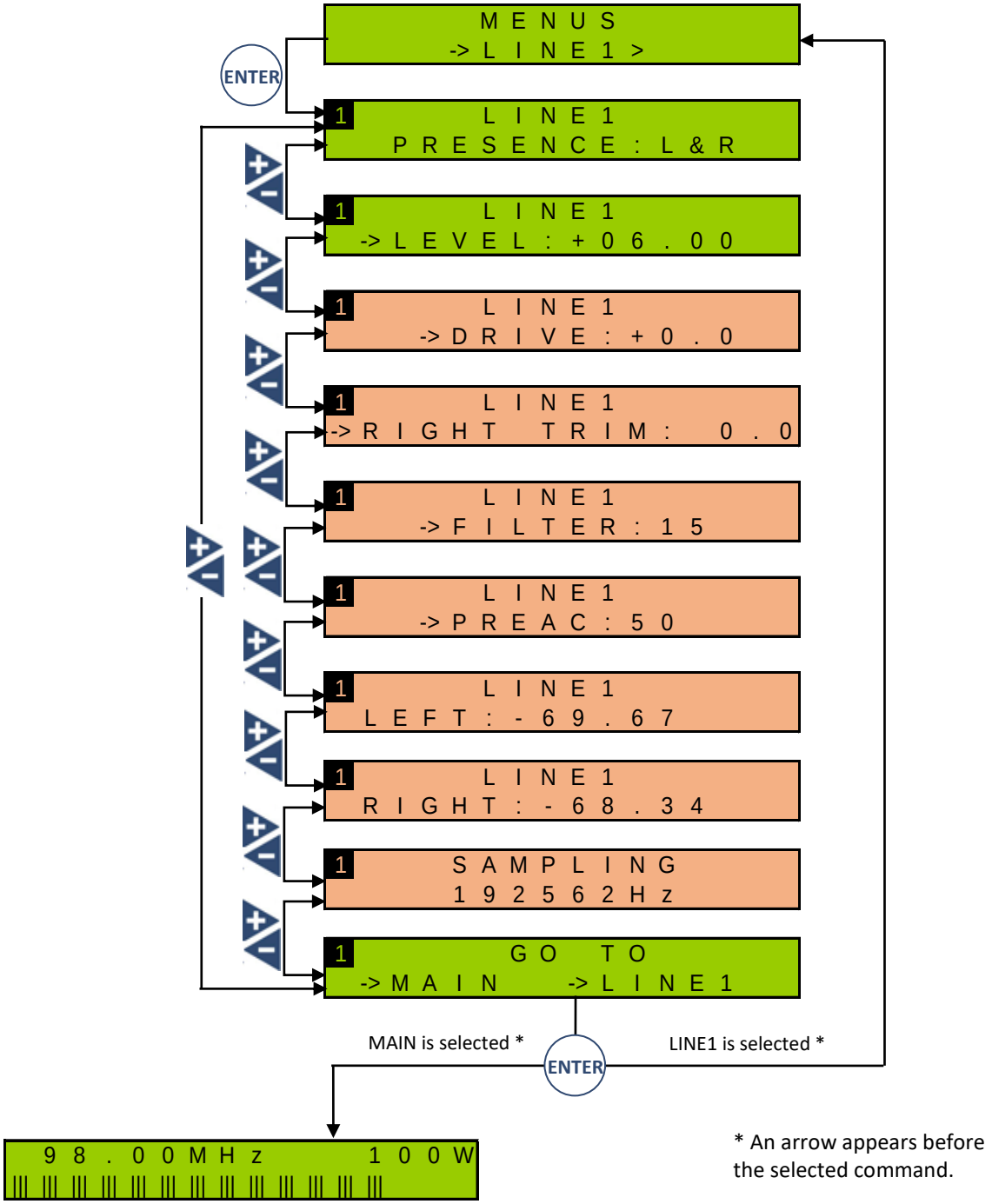
6.3.8. LINE1 Menu

(similar to the Line2 menu and to the Player menu)



Main measurement screen

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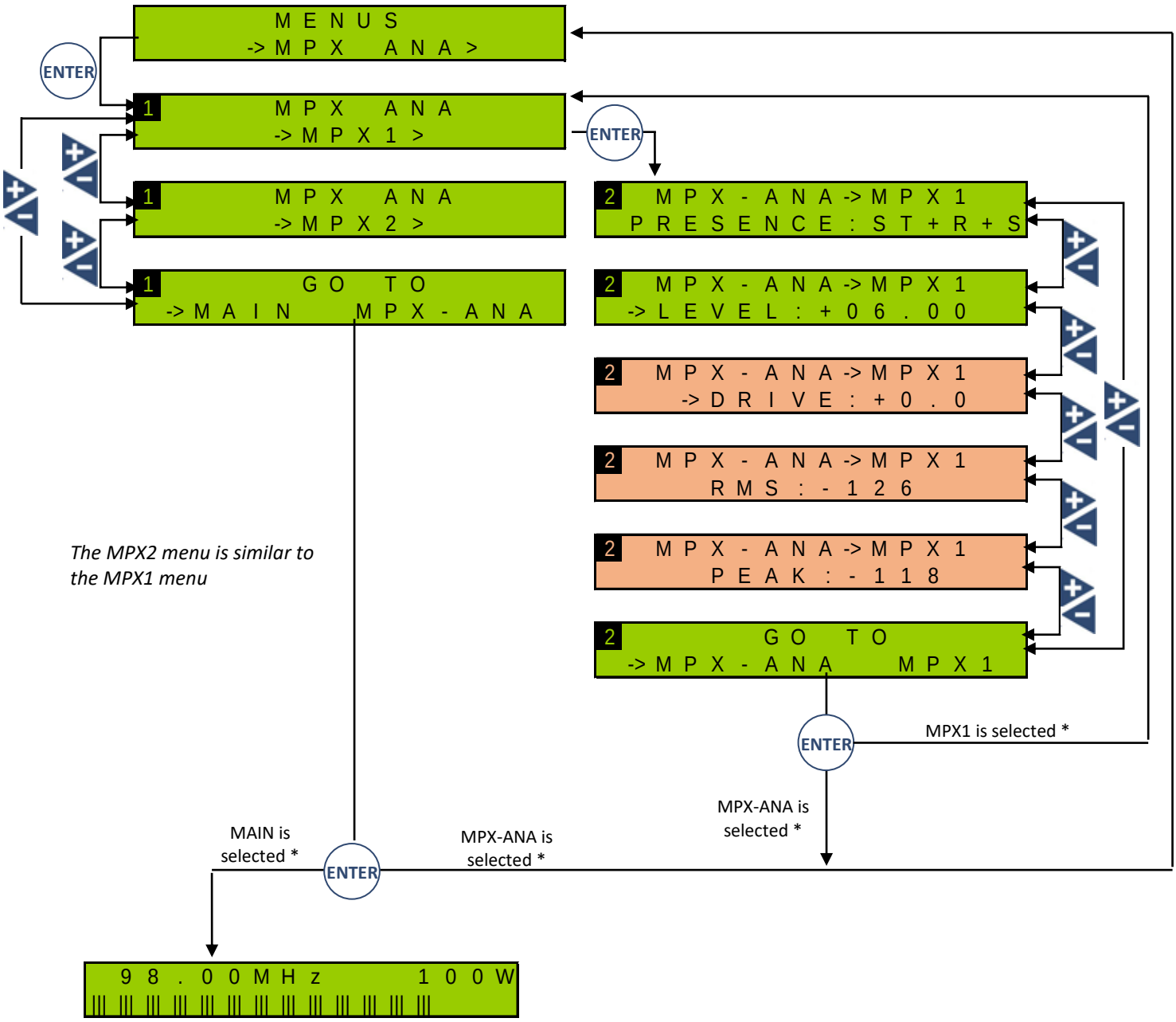
6.3.9. MPX Ana Menu



The MPX2 menu is similar to the MPX1 menu

Main measurement screen

* An arrow appears before the selected command.

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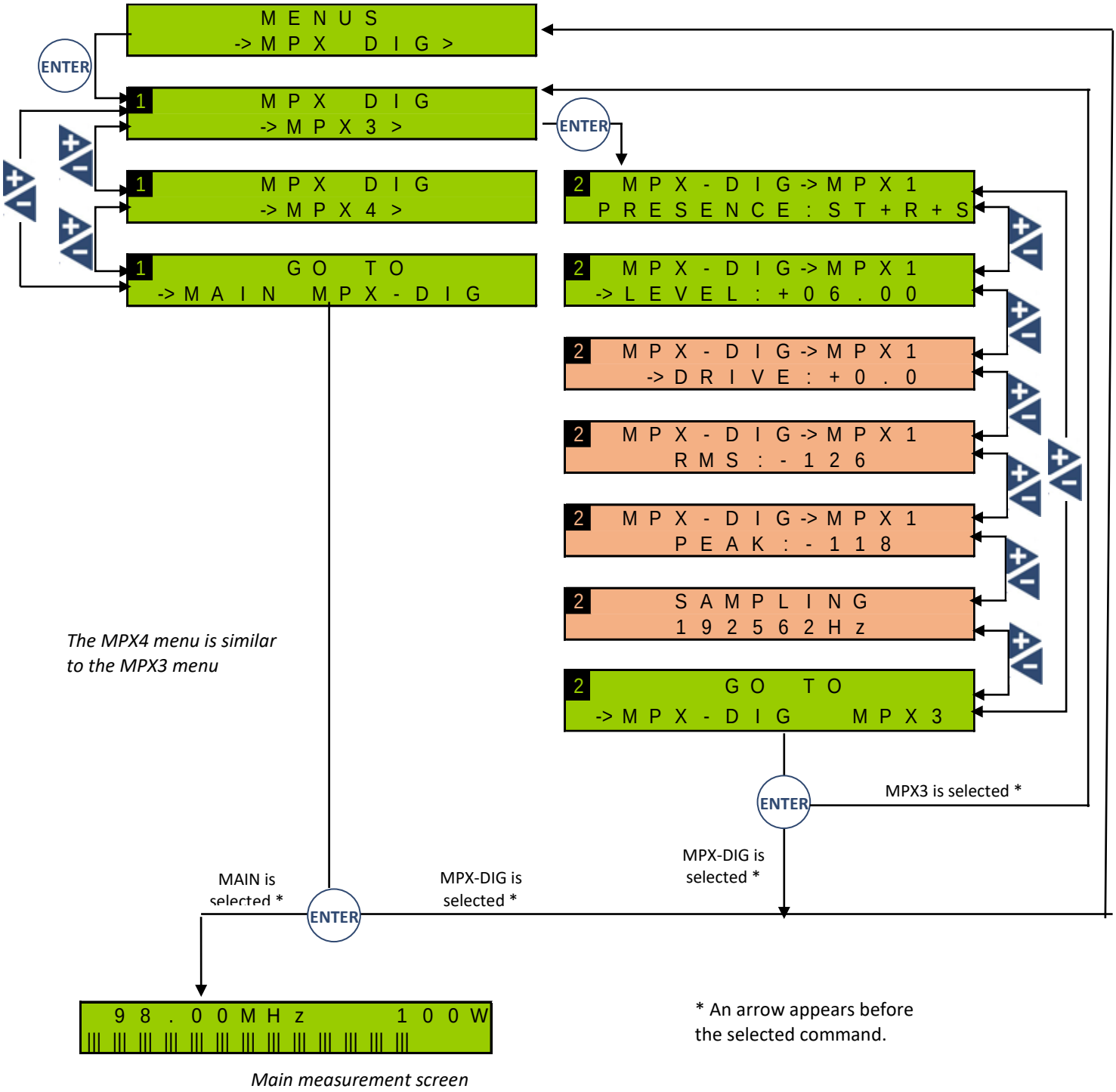
6.3.10. MPX Digi Menu



Main measurement screen

* An arrow appears before the selected command.

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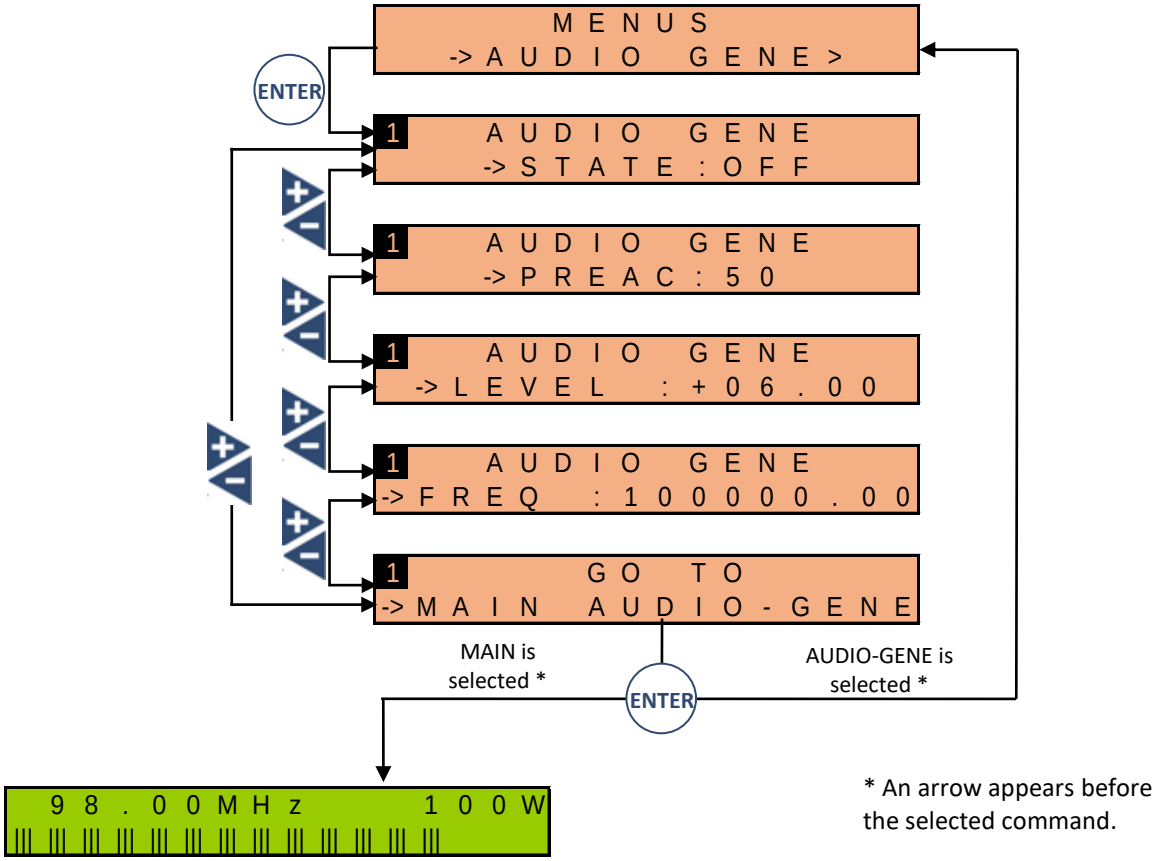
6.3.11. Audio Gene Menu



Main measurement screen

* An arrow appears before the selected command.

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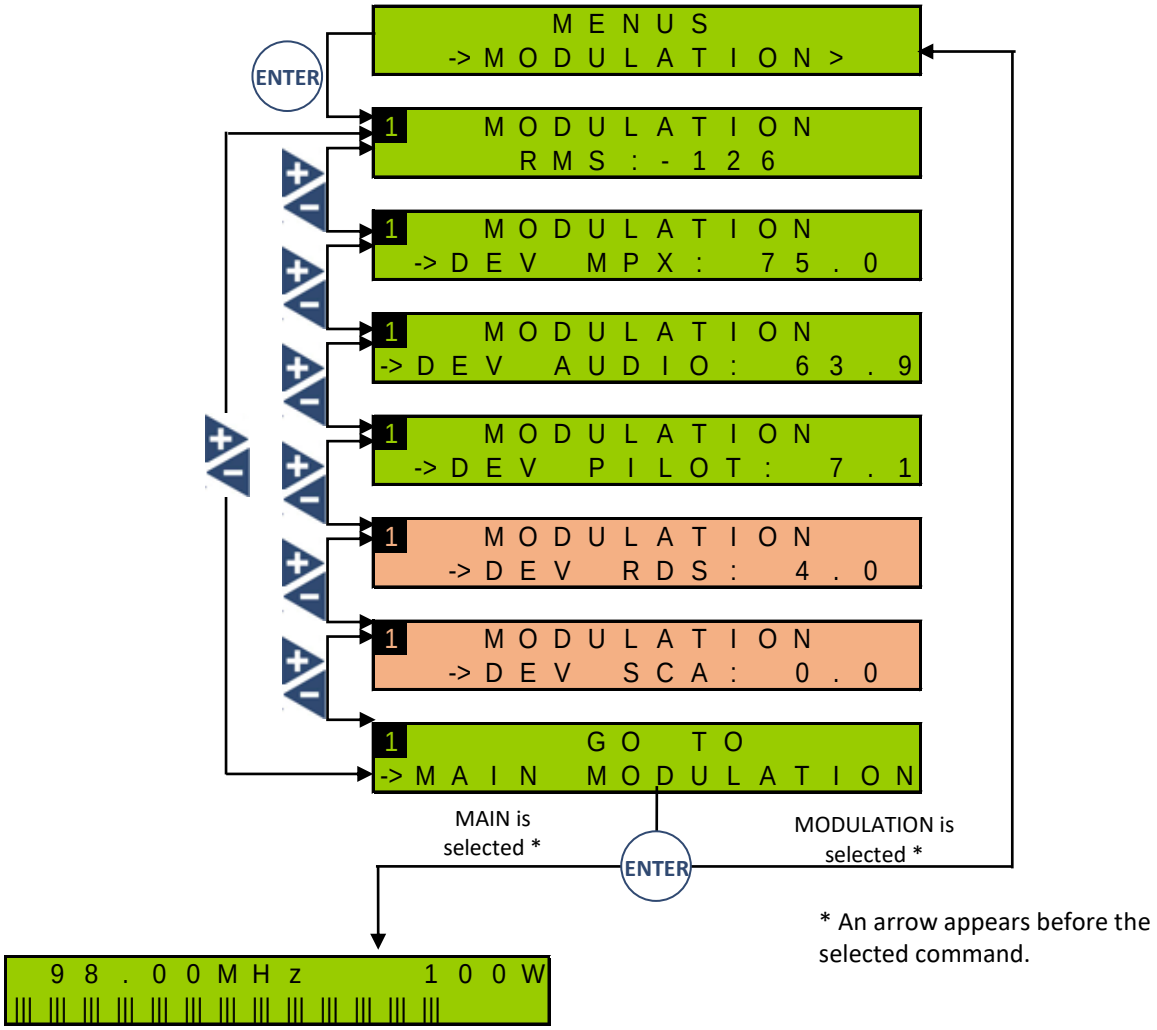
6.3.12. Modulation Menu



* An arrow appears before the selected command.

Main measurement screen

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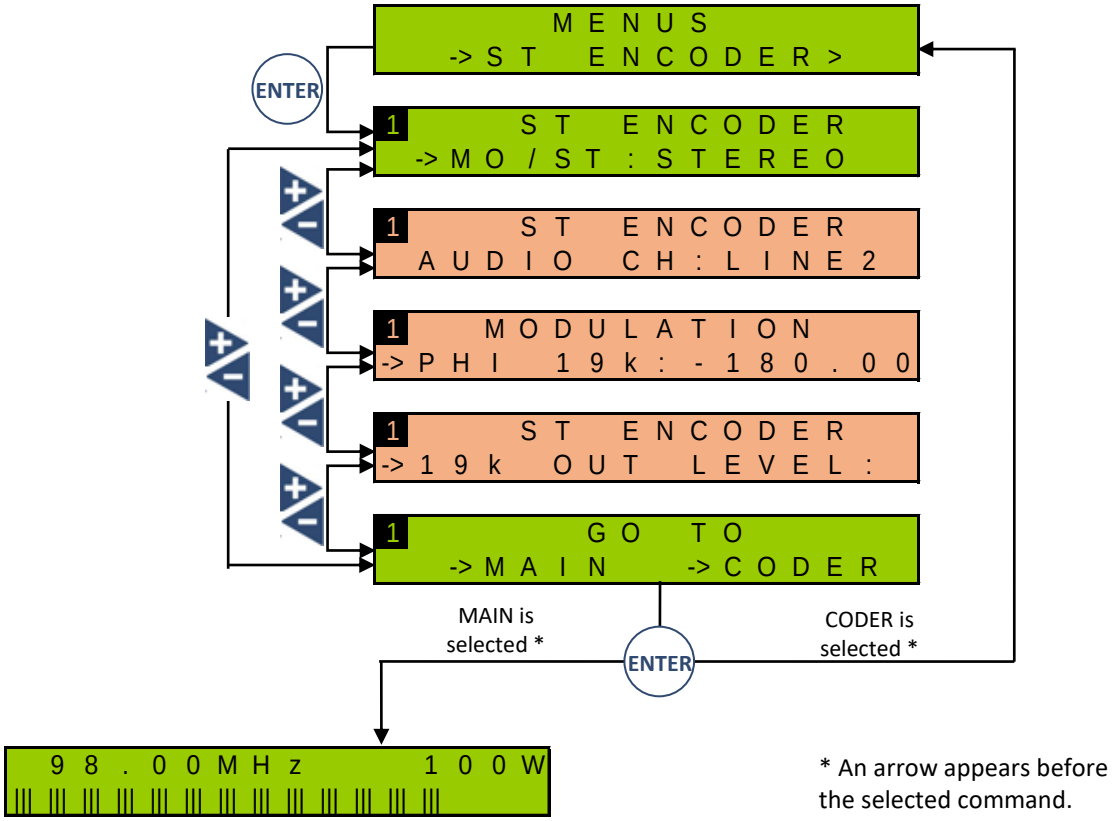
6.3.13. Stereo encoder Menu



Main measurement screen

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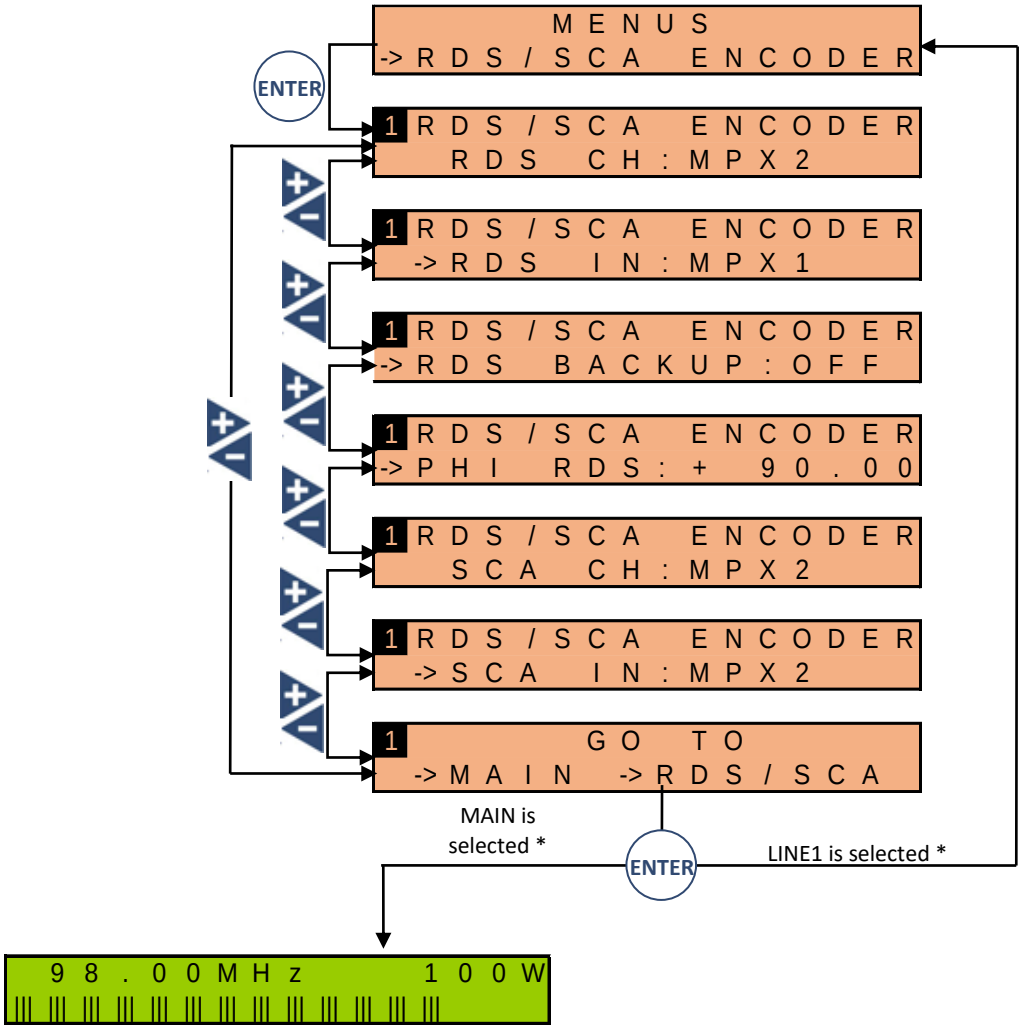
6.3.14. RDS / SCA encoder Menu



Main measurement screen

* An arrow appears before the selected command.

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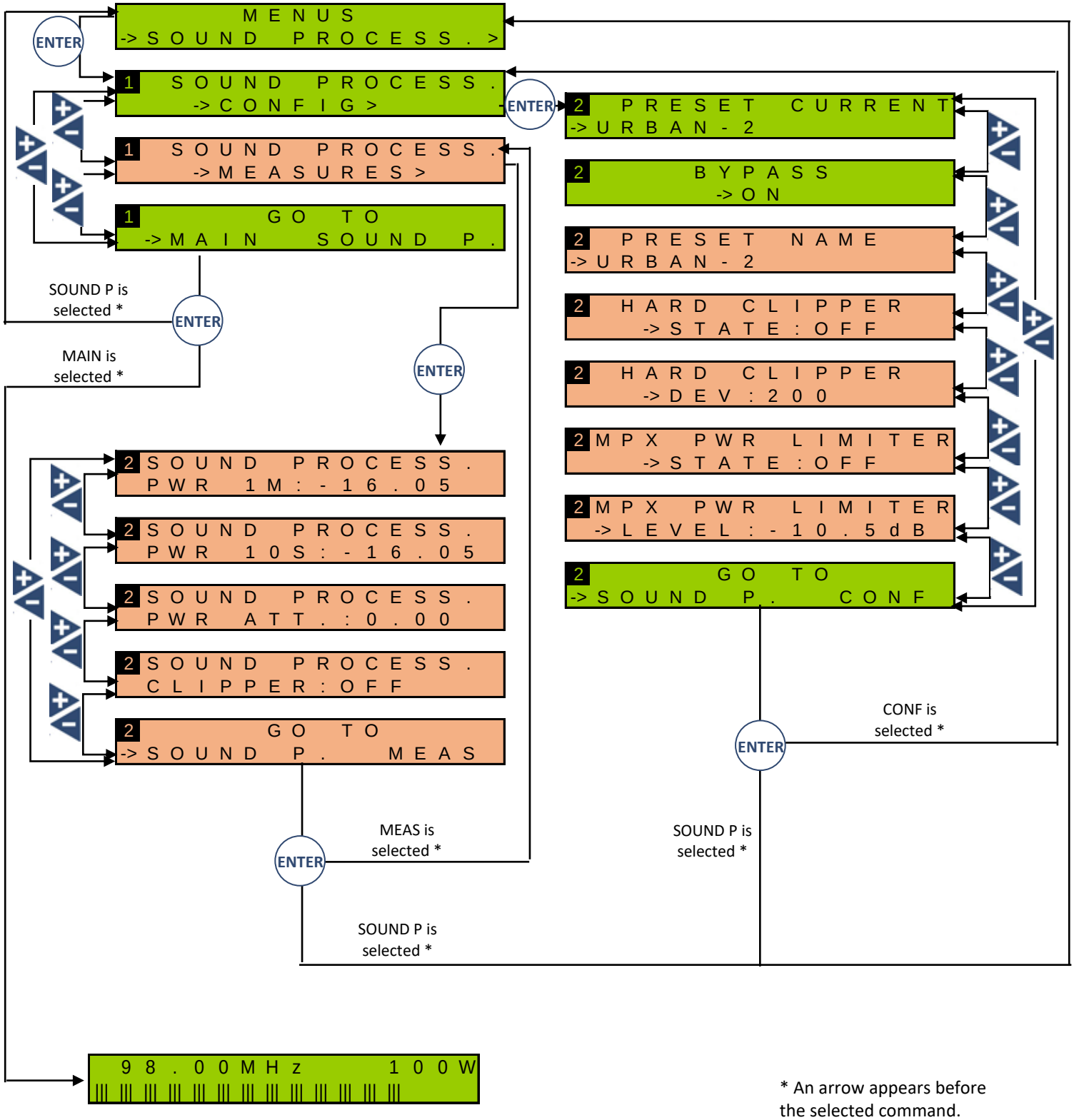
6.3.15. Sound Process Menu



Main measurement screen

* An arrow appears before the selected command.

6.3.16. RDS Menu

ⓘ *This menu is only available when the RDS license is present in the module.*

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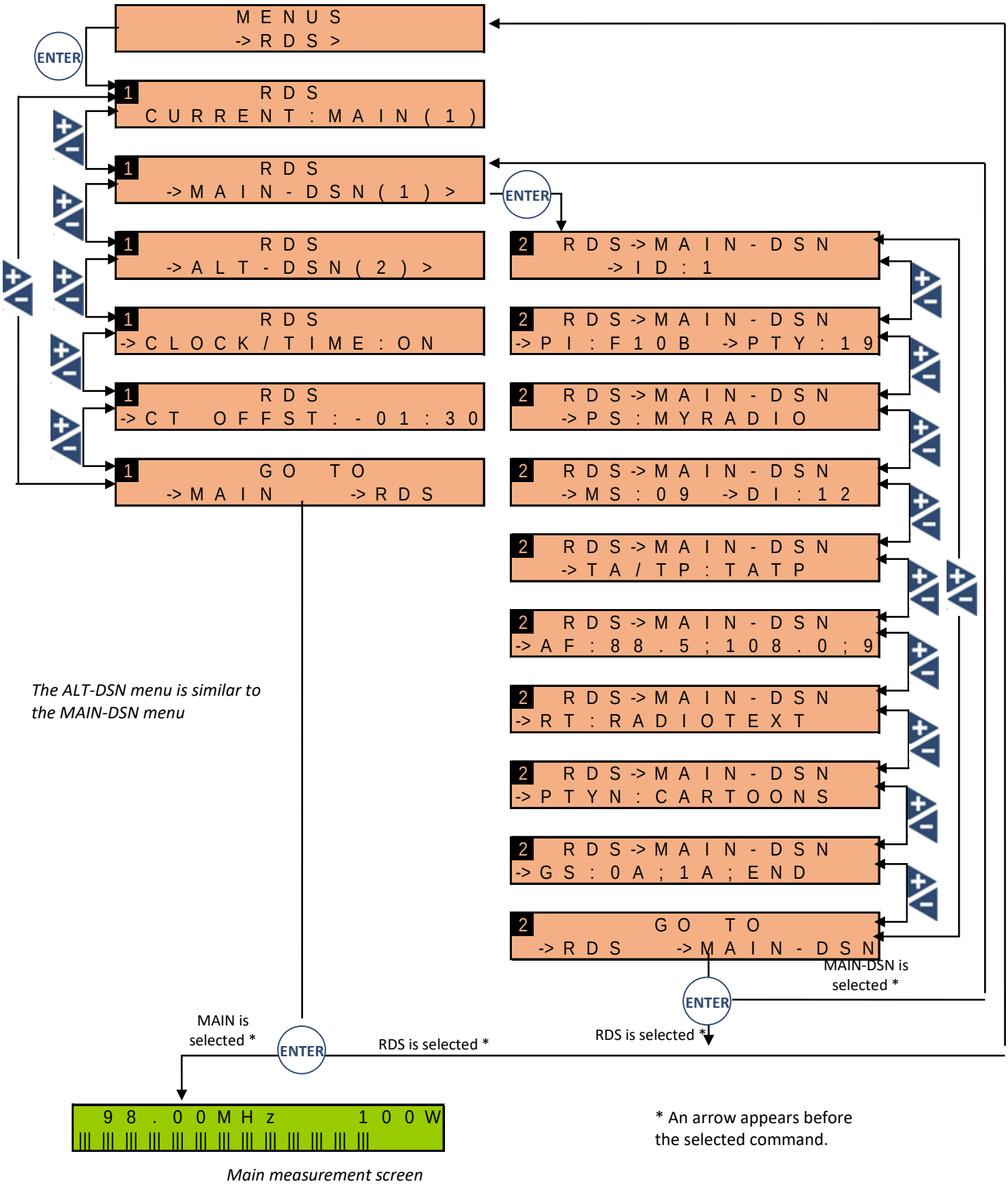

The ALT-DSN menu is similar to the MAIN-DSN menu

Main measurement screen

* An arrow appears before the selected command.

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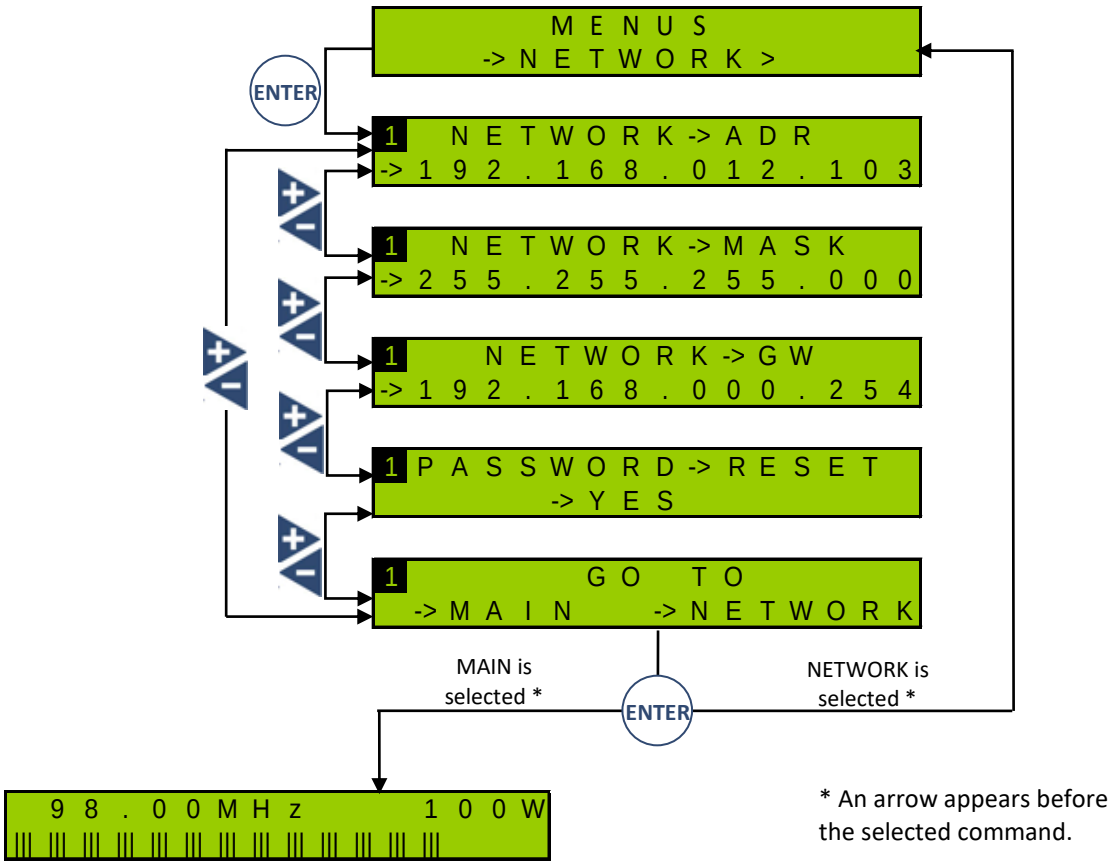
6.3.17. Network Menu



Main measurement screen

* An arrow appears before the selected command.

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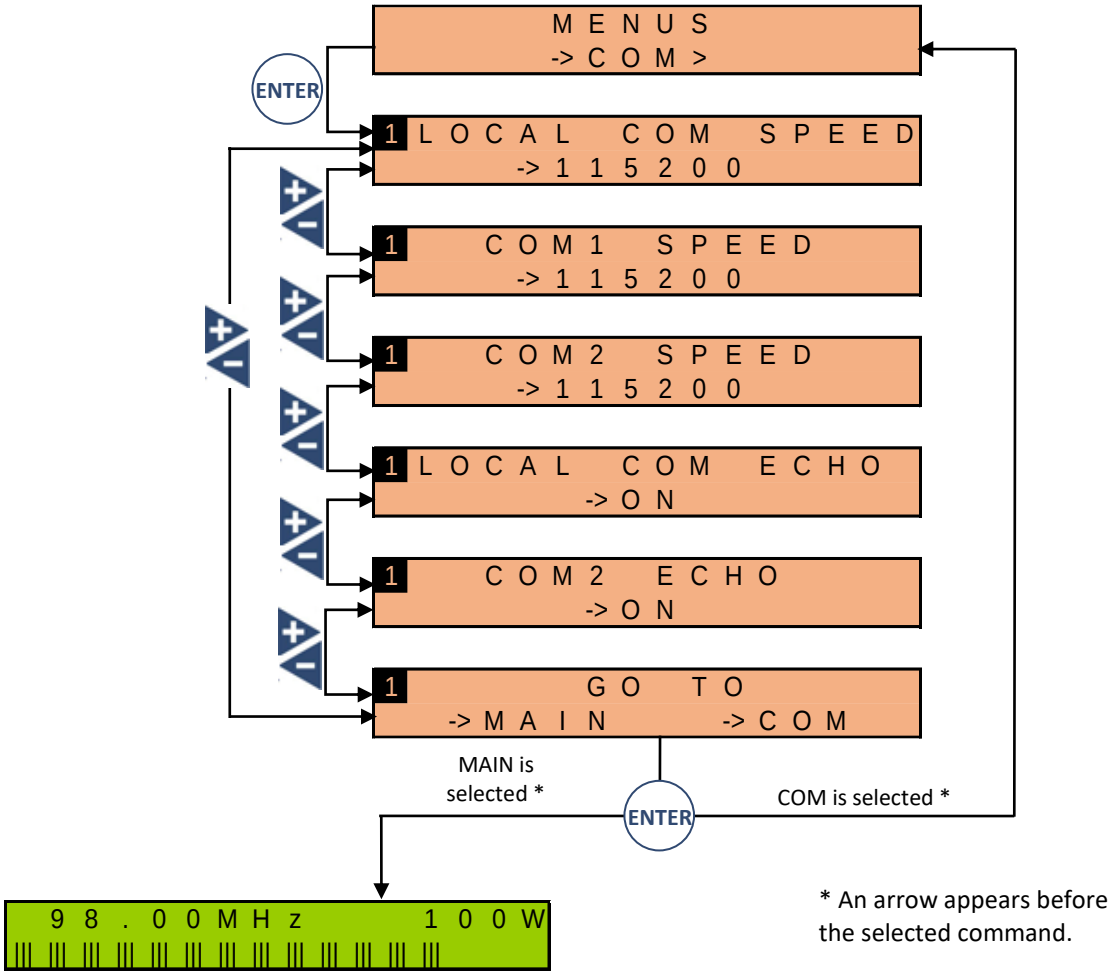
6.3.18. COM Menu



* An arrow appears before the selected command.

Main measurement screen

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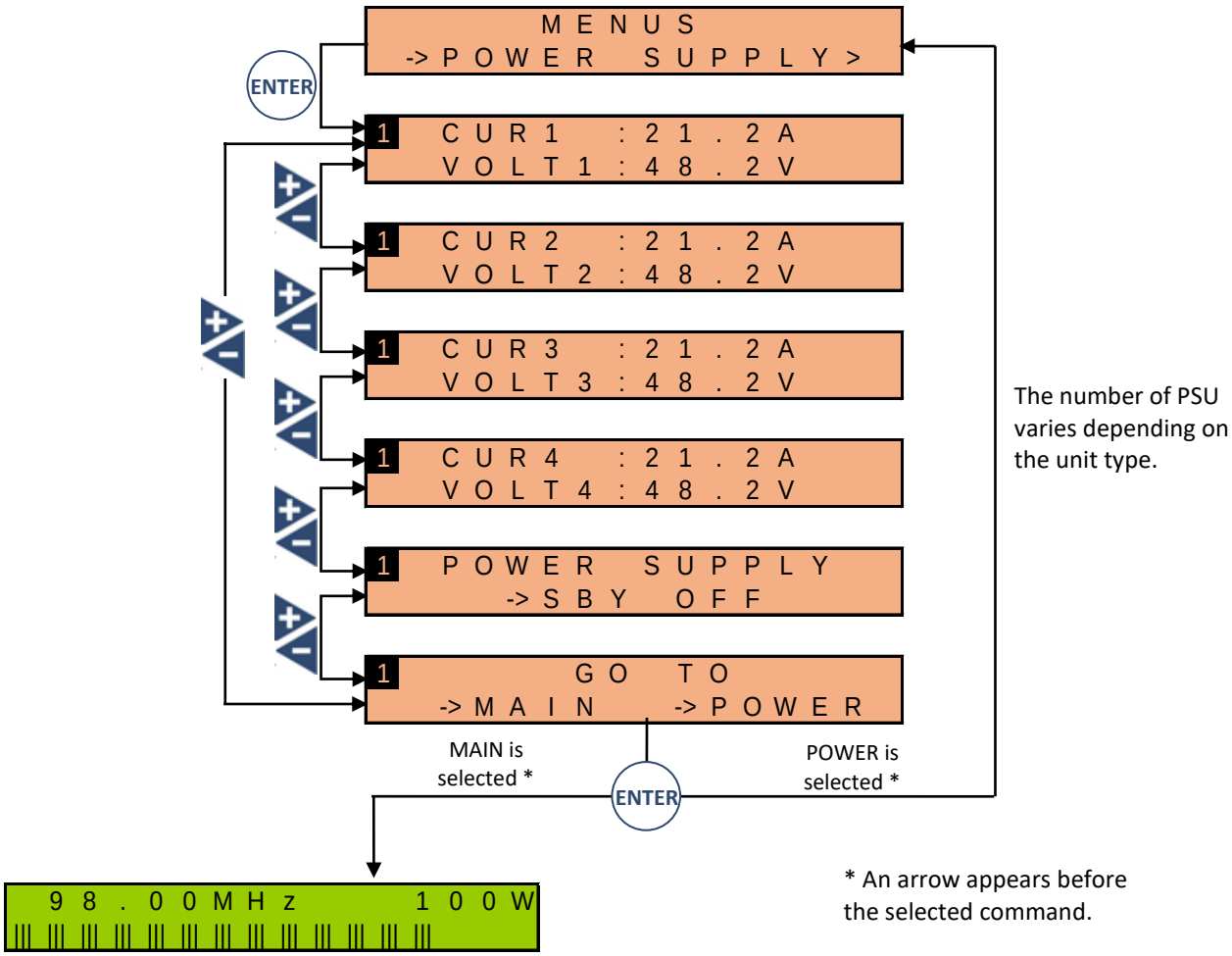
6.3.19. Power supply Menu



* An arrow appears before the selected command.

Main measurement screen

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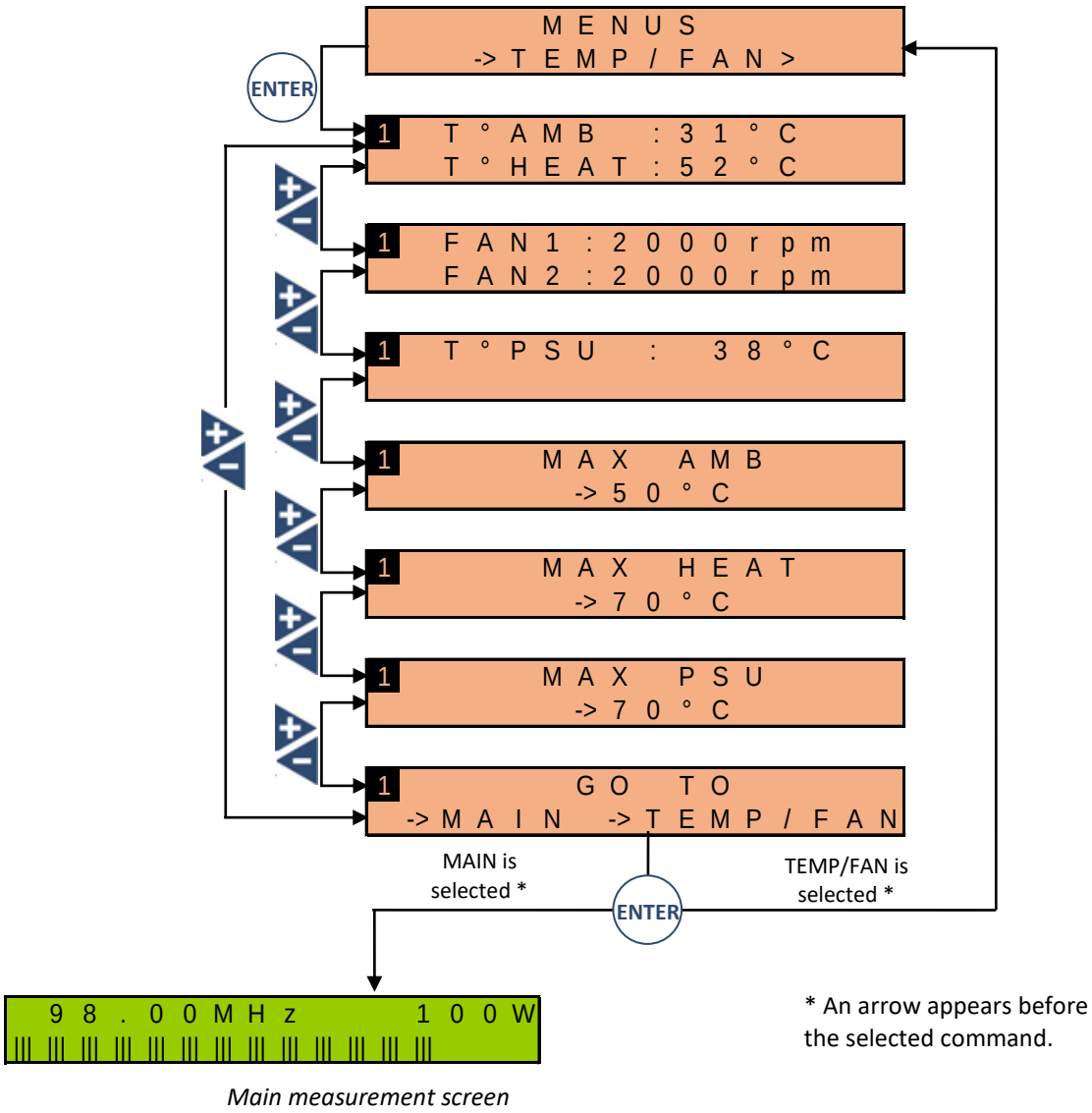
6.3.20. Temp/Fan Menu



Main measurement screen

For modules with several heatsinks, MAX HEAT gives the highest temperature.

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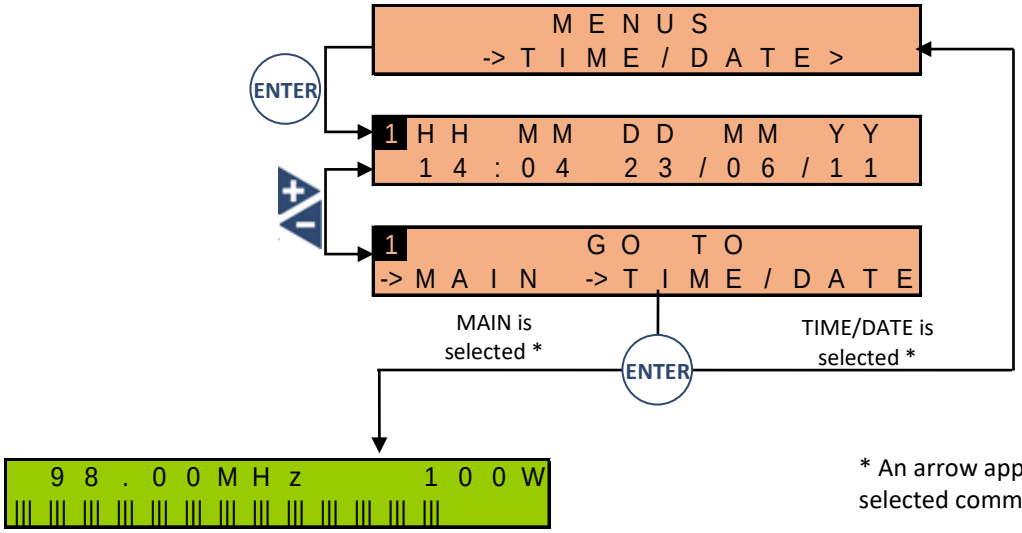
6.3.21. Time/Date Menu



Main measurement screen

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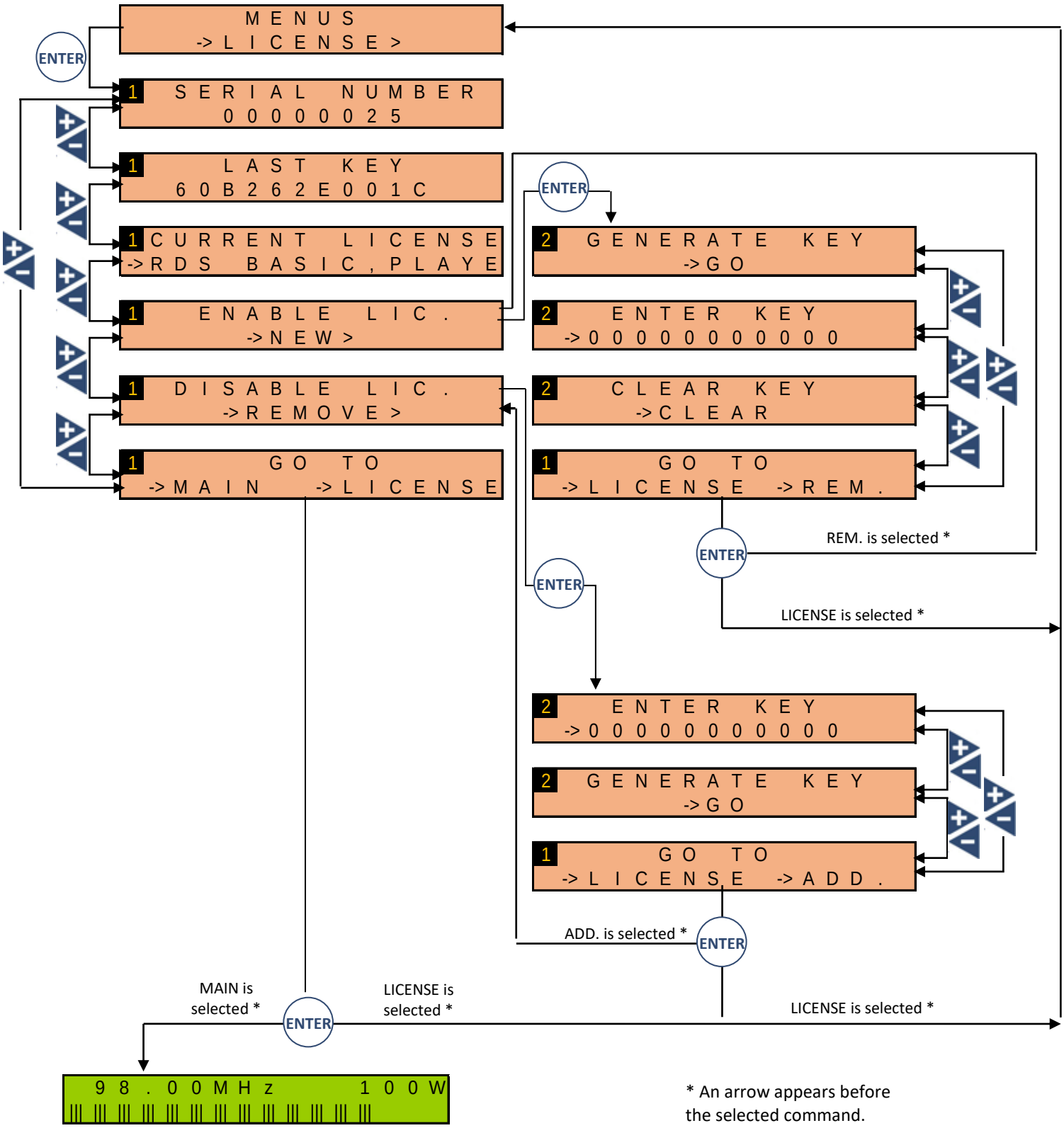
6.3.22. License Menu



Main measurement screen

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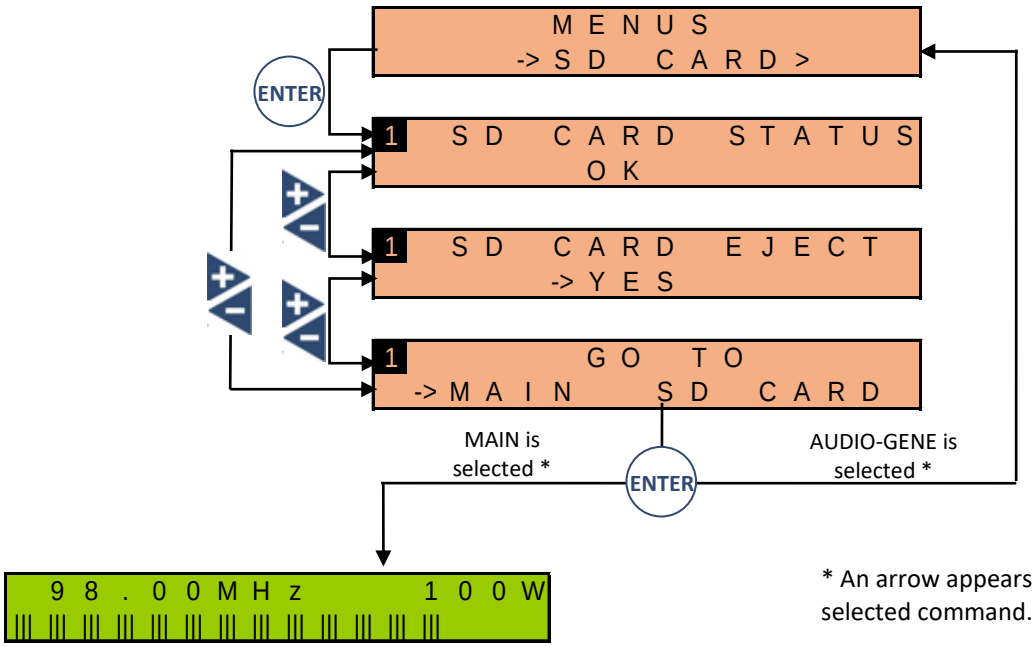
6.3.23. SD Card Menu



Main measurement screen

* An arrow appears before the selected command.

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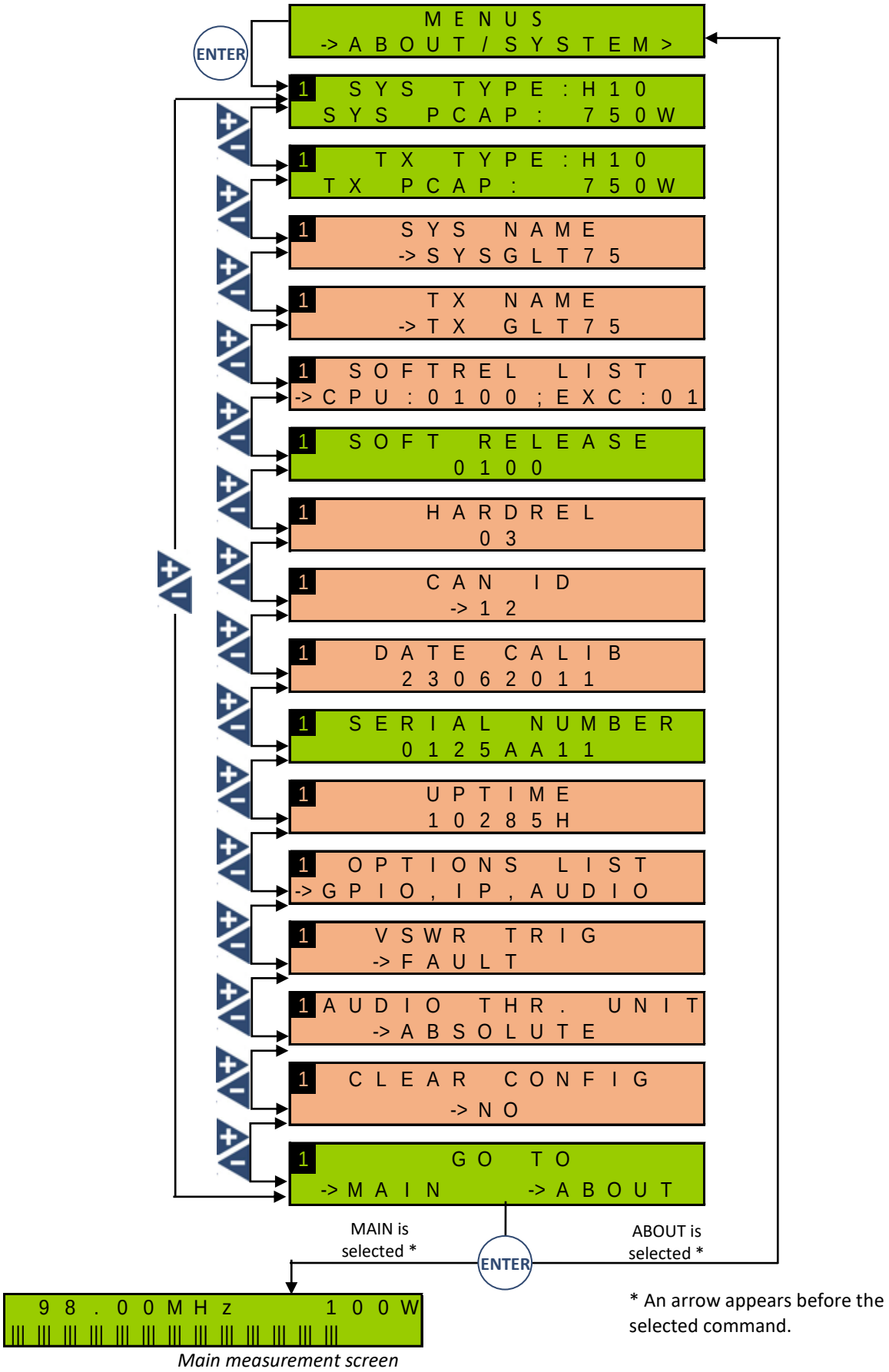
6.3.24. About / System Menu



Main measurement screen

* An arrow appears before the selected command.

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6.3.25. Easy/Expert Menu

```
M E N U S
-> E A S Y
```

6.3.26. Exit Menu

```
M E N U S
-> E X I T
```

ENTER

```
9 8 . 0 0 M H z        1 0 0 W
||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
```

Main measurement screen

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7. SERIAL & TELNET COMMANDS

7.1. Working principle

Ecreso FM and Ecreso FM Amplifier have a serial interface. The physical connection is done using the SUB-D9 (SERIAL MONITOR) on the front panel. A common computer with an RS 232 interface (example: PC+ Windows + PuTTY) is all you need to send commands. The dialog is in text mode (ASCII) and no specific software is required.

Like all serial PC connected equipment, a good cable and correct communication settings are essential to ensure good communication. The cable must be a straight cable (not crossover), with a female plug to connect to the PC, and male plug to connect to the unit.

To avoid problems during connection, set the same communication speed and identical settings for both devices:

-> 9600	bits per second
-> 8	data bits
-> No	Parity
-> 1	Stop bit
-> No	Handshaking

Commands may also be used in Telnet when the transmitter is fitted with an IP interface.

The commands make it possible to read the functional parameters (R) or even to edit some of them (W).

Before entering any command, connect with the command for read and write access:

```
LOGIN
```

❗ ***Without this line, parameters will be in read-only mode; you will not be able to modify them.***

To retrieve the value of a functional parameter, simply enter the command name and press the <Enter> key.

Example:

To display the status of the 3 dB alarm, type:

```
ALARM.3DB
```

The answer, `ON` or `OFF` will indicate the 3 dB alarm is on or not.

To set a parameter, type the command name, the equal sign, the new value and press the <Enter> key.

Example:

To set the transmitter working mode (local or remote), type:

```
CONF.MODE=LOCAL
```

The answer: `LOCAL` will indicate the command has been implemented. In case it has not, the message `ERROR CMD` will appear.

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Protection with a password:

By default, there is no protection to send commands.

This can be secured with the command:

`SYS.PASSWORD = my_password`, where my_password is the password you chose

To connect without a password, enter:

```
LOGIN
```

And if a password has been set:

```
LOGIN = my_password
```

For Telnet connections, use the embedded website identifiers (see section 9.7.7), IP_user and my_IP_password in the following exemple:

```
LOGIN USER=IP_user
LOGIN PASSWORD= my_IP_password
```

The password set with the SYS.PASSWORD command is not used with remote connections.

To logout, use the LOGOUT command or close the terminal window. When disconnecting from a specific port (local or remote), all ports are disconnected.

If several users are connected at once, they all can send commands and change parameters. The last edit will always be taken into account.

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7.2. Ecreso FM and Ecreso FM Amplifier serial commands

7.2.1. System commands

Greyed out commands are Ecreso FM only commands.

NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
LOGIN	R/W	XXXX,X=[0…z] "LOGGED" or "NOT LOGGED"	Logs the user and allows them to update variables if the password is correct. Returns Logged or not logged
LOGOUT	W		Logs out the user and locks all variables.
SYS.CID	R/W	[0..31]	Unit identifier used by the CAN bus.
SYS.CIDIP	R/W	[0..31]	Unit identifier used by the IP CAN bus
SYS.CIDUC	R/W	[0..31]	Unit identifier used by the CAN2 bus.
SYS.COM1.ECHO	R/W	"ON" or "OFF"	Adds the local echo on the rear panel serial port
SYS.COM1.SPEED	R/W	9600,19200,38400,57600,115200	Speed of the rear panel serial port 1
SYS.COM2.ECHO	R/W	"ON" or "OFF"	Adds the local echo on the rear panel serial port
SYS.COM2.SPEED	R/W	9600,19200,38400,57600,115200	Speed of the rear panel serial port 2
SYS.DATE	R/W	DD/MM/YY	Reads and sets the amplifier date
SYS.DATECALIB	R	DDMMYYYY	Date of the last calibration
SYS.DIGMPX	R/W	"YES" or "NO"	Sets the input type for LINE2. NO= LINE2 as audio input; YES= LINE2 as MPX input
SYS.GPIO.CONF1	R/W	"AMB" or "FAN1" or "VOLT" or "HEAT" or "FAN2" or "CURRENT" or "PWR"	Sets the RC ANA3 on an analog GPIO board
SYS.GPIO.CONF2	R/W	"AMB" or "FAN1" or "VOLT" or "HEAT" or "FAN2" or "CURRENT" or "PWR"	Sets the RC ANA4 on an analog GPIO board
SYS.GPIO.IN.ACT	R	XX X=[A..F;0..9]	Indicates the corresponding RC when assigned to an external unit.
SYS.GPIO.IN.MASK	R/W	XX X=[A..F;0..9]	Sets the RC control either by the control board or by an external unit (IP board). Hexadecimal code: each bit corresponds to an input. Ex: A1 (10100001) indicates the RC 1, 6 and 8 are assigned to the IP board.
SYS.GPIO.OUT.ACT	R/W	XX X=[A..F;0..9]	Enables the corresponding RM when controlled by an external unit.
SYS.GPIO.OUT.MASK	R/W	XX X=[A..F;0..9]	Sets the RM control either by the control board or by an external unit (IP board). Hexadecimal code: each bit corresponds to an input: Ex: 21 (00100001) indicates RM 1 and 6 are controlled by the IP board.
SYS.HARDREL	R	xx.xx.xx x=[0..9]	Hardware version: example "3.0.1"
SYS.INIT	R/W	XXXX ; X=[0…F]	Reinitialization flag. b0=complete reset b1=SYS.PASSWORD_RST
SYS.IP.ADR	R/W	XXX.XXX.XXX.XXX X=[0…9]	IP address of the IP board
SYS.IP.GW	R/W	XXX.XXX.XXX.XXX X=[0…9]	Network gateway of the IP board
SYS.IP.MAC	R/W	XX:XX:XX:XX:XX:XX:XX:XX X=[A..F;0..9]	Mac address of the IP board
SYS.IP.MASK	R/W	XXX.XXX.XXX.XXX X=[0…9]	IP mask of the IP board
SYS.KEY.ADD	R/W	ADD	Generates a key to enable the specified option
SYS.KEY.RDS_STATIC	R		Gives the remaining time on a temporary RDS license
SYS.KEY.REM	R/W	REM	Generates a key to disable the specified option

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NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
SYS.KEY.RF	R		Gives the remaining time on a temporary activation license
SYS.KEY.SFM	R		Gives the remaining credits on a SmartFM license
SYS.KEY.SOUND_PROC	R		Gives the remaining time on a temporary Sound Processing license
SYS.LCDMENUS	R/W	"NORMAL" or "ADVANCED"	Sets the display type on the front panel screen
SYS.LOCALCOM.ECHO	R/W	"ON" or "OFF"	Adds the local echo on the front panel serial port
SYS.LOCALCOM.SPEED	R/W	9600,19200,38400,57600,115200	Speed of the front panel serial port
SYS.LOG	R		List of the latest 200 events (configuration changes, alarm start date and end date…)
SYS.LOG.CLR	W		Clears the event list
SYS.MEMORY	R	"PRES" or "NOT PRES"	Indicates if the optional memory required for SFN is present
SYS.NAME	R/W	XXXX X=[A…Z]	Equipment name
SYS.OPT.LIST	R	GPIO_STD, GPIO_ANA, RF_PROBE, IP, COM_STD, MPX_IN, AUDIO_IP, TUNER, RDS_STATIC, RDS_DYNAMIC, POWERFUL_CONTROL	List of implemented options
SYS.PASSWORD	R/W	xxx x=[A..Z;0..9]	Password for the console and front panel display. 'NONE' disables the password
SYS.PASSWORD.RESET	R/W	xxx x=[A..Z;0..9]	Creates a text string to unlock the password if it has been forgotten
SYS.PAVL	R	[0..9999]	Max power, set in factory and limited depending on the type of unit. This limitation can be requested by regulating agencies.
SYS.PCAP	R	[0..999]	Nominal power of the unit: example "300"=>300 W
SYS.RAZ	W	"RAZ"	Reloads default values. With an IP unit, **wait for IP connection to be available before shut off**.
SYS.RST	W		Reset of all parameters.
SYS.RST.CPU	W	"RST"	General reset of the µc. Sends the return code: RST
SYS.RST.EXCHW	W	"RST"	Material restart of the exciter card
SYS.RST.EXCSW	W	"RST"	Software restart of the exciter card
SYS.SDC.EJECT	R/W	"YES" or "NO"	Request the removal of the µSD card. This command can only be sent locally.
SYS.SDC.FAULT	R	"OK" or "FAULT"	Failed = read/write error on the µSD card
SYS.SDC.STATE	R	"MOUNT" or "UNMOUNT"	Gives the status of the µSD card. The state must be UNMOUNT before the card can be removed.
SYS.SDC.PRES	R	"PRES" or "NOT PRES"	Indicates whether a µSD card is present
SYS.SN	R	YYMMXXXX A,M,X=[0..9]	Serial number of the unit: Y => year, M => month, X => number
SYS.SOFTREL	R	xx.xx.xx x=[0..9]	Software version: example "3.0.1"
SYS.SOFTREL.LIST	R	xx.xx.xx x=[0..9]	List of the exciter software versions CPU;DSP;FPGA;IP;EXC;A/IP;TUN
SYS.TIME	R/W	HH:MM:SS	Reads and sets the amplifier time
SYS.TYPE	R	xxx x=[A..Z;0..9]	Unit type.
SYS.UNIT	R/W	"ABSOLUTE" or "PERCENT" or "RELATIVE"	Input method for audio silence detection threshold. It is used for commands INPUT.xxx.SW.THRESH; default value: RELATIVE
SYS.UPTIME	R	[0..99999999]	Indicates the number of working hours since commissioning

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7.2.2. Measurement commands

Greyed out commands are Ecreso FM only commands.

Commands in bold are Ecreso FM Amplifier and Ecreso FM with integrated amplifier (300 W to 2000 W) only commands.

Commands followed by two stars (**) are available with modules sold in v.1.2.2 or higher.

NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
MEAS.12V	R	xx.x x=[0..9]	Measures the 12 V voltage
MEAS.5V	R	xx.x x=[0..9]	Measures the 5 V voltage
MEAS.AMB	R	±[0..125]	Measures the ambient temperature from 0 to 125°C. "52"=>52°C.
MEAS.CLIP	R	"ON" or "OFF"	Status of the hardware limiter
MEAS.CUR1	**R**	**xxx.x x=[0..9]**	**Measures the power supply 1 current. Examples: "02.0"=>2 A "15.2"=> 15.2 A**
MEAS.CUR2	**R**	**xxx.x x=[0..9]**	**Measures the power supply 2 current. Examples: "02.0"=>2 A "15.2"=> 15.2 A (1500 & 2000 W modules only)**
MEAS.CUR3	**R**	**xxx.x x=[0..9]**	**Measures the power supply 3 current. Examples: "02.0"=>2 A "15.2"=> 15.2 A (2000 W modules only)**
MEAS.CUR3	**R**	**xxx.x x=[0..9]**	**Measures the power supply 4 current. Examples: "02.0"=>2 A "15.2"=> 15.2 A (2000 W modules only)**
MEAS.DEV.PEAK	R	-150,0…150,0	Gives the peak value for the signal deviation in kHz
MEAS.DEV.PKMAX	R	-150.0…150.0	Gives the peak value for the signal deviation in kHz over 1 second
MEAS.DEV.RMS	R	-150.0…150.0	Gives the average value for the signal deviation in kHz
MEAS.EXC_TEMP	R	±[0..125]	Gives the temperature of the modulator board
MEAS.FAN1.SPEED	**R**	**xxx.x x=[0..9]**	**Fan 1 speed in RPM**
MEAS.FAN2.SPEED	**R**	**xxx.x x=[0..9]**	**Fan 2 speed in RPM (1500 & 2000 W modules only)**
MEAS.HEAT1	**R**	**±[0..125]**	**Measures the heatsink 1 temperature**
MEAS.HEAT2	**R**	**±[0..125]**	**Measures the heatsink 2 temperature (1500 & 2000 W modules only)**
MEAS.HEAT3	**R**	**±[0..125]**	**Measures the heatsink 3 temperature (2000 W modules only)**
MEAS.HEAT4	**R**	**±[0..125]**	**Measures the heatsink 4 temperature (2000 W modules only)**
MEAS.INT_TEMP **	**R**	0…999	Measure of the temperature of the internal sensor.
MEAS.M.PKMAX	R	-150.0…150.0	Absolute value max of the channel M in kHz
MEAS.MPXPWR.10S	R	-320.00...+320.00	Value of the MPX power over 10 seconds
MEAS.MPXPWR.1M	R	-320.00...+320.00	Value of the MPX power over 1 minute
MEAS.MPXPWR.ATT	R	-320.00...+320.00	Value of the attenuation applied to limit MPX power
MEAS.N12V	R	-xx.x x=[0..9]	Measures the -12 V voltage
MEAS.PCONS	R	[0..9999]	Power used by unit
MEAS.PFWD	R	[0..9999]	Measure of direct power. examples: "20" or "300" => 300 W
MEAS.PFWD.AVG	R	[0..9999]	Average measured power
MEAS.PFWD1	**R**	**[0..9999]**	**Measure of direct power of pallet 1. examples: "20" or "300" => 300 W**

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NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
MEAS.PFWD2	**R**	**[0..9999]**	**Measure of direct power of pallet 2. examples: "20" or "300" => 300 W (1500 & 2000 W modules only)**
MEAS.PIN	**R**	**[0..99.9]**	**Measures the input power**
MEAS.PREF	R	xxx.x x=[0..9]	Measure of reflected power: "20" => 2 W
MEAS.PRESSURE **	R	0…2000	Measure of the pressure on the internal sensor.
MEAS.PSU_TEMP	R	±[0..125]	Measures the temperature of the PSU
MEAS.S.PKMAX	R	-150.0…150.0	Absolute value max of the channel S in kHz
MEAS.SFM	R	[0..125]	SmartFM coefficient to be applied to the set power
MEAS.SFN.DELAY	R	0… 5000000.00	Delay applied to the signal in µs
MEAS.VOLT1	**R**	**xxx.x x=[0..9]**	**Measures the power supply 1 voltage. Example: "48.0" =>48.0 V**
MEAS.VOLT2	**R**	**xxx.x x=[0..9]**	**Measures the power supply 2 voltage. Example: "48.0" =>48.0 V (1500 & 2000 W modules only)**
MEAS.VOLT3	**R**	**xxx.x x=[0..9]**	**Measures the power supply 3 voltage. Example: "48.0" =>48.0 V (2000 W modules only)**
MEAS.VOLT4	**R**	**xxx.x x=[0..9]**	**Measures the power supply 4 voltage. Example: "48.0" =>48.0 V (2000 W modules only)**
MEAS.VSWR	R	XX.X X=[0..9]	VSWR measure "01.0" or "20.0"
MEAS.VSWR_DB	R	XXXX.X X=[0..9]	VSWR measure in dB. Ex: “1.2” => 1.2 dB
MEAS.VSWRTRIP		[0..99]	Gives the number of reflected power safety in the past hour

7.2.3. Transmitter commands

These commands are global commands; they apply to the whole transmitter. To configure specific modules, use CONF commands (see next section).

Commands available both as TX and CONF are followed by a star (*).

For Ecreso FM transmitters with no external amplifier who are not controlled by a central unit (Ecreso Control Unit), use TX commands.

NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
TX.1DB *	R/W	[0..9999]	Sets the triggering threshold for the 1 dB alarm. Example "250" => 250 W
TX.3DB *	R/W	[0..9999]	Sets the triggering threshold for the 3 dB alarm. Example "250" => 250 W
TX.3DB.AUTO *	R/W	"ON" or "OFF"	If ON set the 3 dB level to TX.PWR/2. If TX.3DB is modified, switches automatically to OFF
TX.ALARM.1DB	R	"ON" or "OFF"	ON => 1 dB alarm, OFF => No alarm.
TX.ALARM.3DB	R	"ON" or "OFF"	ON => 3 dB alarm, OFF => No alarm.
TX.ALARM.VSWR	R	"ON" or "OFF"	ON => VSWR alarm, OFF => No alarm
TX.ALARM.VSWRTRIP	R	"ON" or "OFF"	Indicates if there has been a VSWR trip fault (max number of RF shut off/restart cycles has been reached)
TX.FAULT	R	"FAULT" or "OK"	Fault state of transmitter
TX.FREQ *	R/W	XXXXXX	Working frequency of the modulator in kHz "232553" => 232.553 MHz
TX.INTERLOCK	R	"CLOSE" or "OPEN"	State of the safety loop
TX.LINK	R	"OPEN" or "CLOSE"	State of the CAN bus link
TX.MODE *	R	"LOCAL" or "REMOTE"	Single transmitter, indicates the local or remote mode

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NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
TX.NAME	R/W	XXXX X=[A…Z]	Transmitter name
TX.OPMODE	R/W	"ON" or "OFF"	Enables/disables the RF on a single transmitter
TX.PAVL	R	[0..9999]	Max power, set in factory and limited depending on the type of unit. This limitation can be requested by regulating agencies.
TX.PCAP	R	[0..999]	Amplifier nominal power: example "300"=>300W
TX.PCONS	R	[0..99999]	Estimated current power consumption of the transmitter
TX.PCONS.EFF	R	[0..99]	General efficiency of the transmitter
TX.PCONS.PWR	R	[0..99999]	Estimated current power consumption of the transmitter without SmartFM memorized
TX.PCONS.SAVE	R	[0..99999]	Energy savings over 10 seconds
TX.PFWD	R	[0..9999]	Measure of direct power. examples: "20" or "300" => 300W
TX.PFWD.AVG	R	[0..99999]	Average measured power
TX.PFWD.BOOST	R	[0…100000]	Boost power
TX.PREF	R	xxx.x x=[0..9]	Measure of reflected power: "20" => 2W
TX.PWR *	R/W	[0..9999]	Sets the output power. From 0 to 9999
TX.PWR_MAX *	R/W	[0..99999]	Set the max power of the transmitter TX.PWR. Limited by TX.PAVL
TX.PWR.SFM	R	[0..99999]	Power after SmartFM coefficient is applied
TX.RFPRESENT	R	"PRES" or "NOT PRES"	Indicates if the single transmitter output power is present
TX.RFPRESENT.MIN *	R/W	[0..9999]	TX.RFPRESENT (presence RF) triggering threshold; default value: 0
TX.SBY *	R/W	"ON" or "OFF"	Enables/disables the standby mode
TX.SFM	R	[25…125]	SmartFM coefficient to be applied to the set power
TX.TYPE	R	xxx x=[A..Z;0..9]	System type: example "1000-NT" For a 1000 W transmitter with Ecreso Control Unit
TX.VSWR	R	XX.X X=[0..9]	VSWR measure "01.0" or "20.0"
TX.VSWR_DB	R	XXXX.X X=[0..9]	VSWR measure in dB. Ex: “1.2” => 1.2 dB
TX.VSWR.MAX *	R/W	XX.X X=[0..9]	Sets the triggering threshold for the VSWR alarm. Must be of type "XXX"."020" => VSWR = 2. Do not use "2" or "1.4".
TX.VSWRTRIP *	R/W	"ON" or "OFF"	Enables/disables reflected power safety using a RF shut off/restart method
TX.VSWRTRIP_COUNT	R	0…4	VSWR trip fault counter
TX.WARNING	R	"ON" or "OFF"	Single transmitter. Warning state of single transmitter

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7.2.4. Configuration commands

These commands are specific to an individual unit.

When a command is available both as TX and as CONF (followed by a star (*) below), it should be used only in local maintenance.

Greyed out commands are Ecreso FM only commands.

Commands in bold are Ecreso FM Amplifier and Ecreso FM with integrated amplifier (300 W to 2000 W) only commands.

Commands followed by two stars (**) are available with modules sold in v.1.2.2 or higher.

NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
CONF.10M.OPE	R/W	"AUTO or "MANU"	Indicates the operating mode of the external 10 MHz input
CONF.1DB *	R/W	[0..999]	Set the 1 dB alarm threshold. Example "250" => 250 W
CONF.3DB *	R/W	[0..999]	Set the 3 dB alarm threshold. Example "250" => 250 W
CONF.3DB.AUTO *	R/W	"ON" or "OFF"	If ON set the 3 dB level to TX.PWR/2. If TX.3DB is modified, automatically switches to OFF
CONF.AMB.MAX	R/W	[0..99]	Sets the triggering threshold for the ambient temperature alarm
CONF.AUDIO.LOSS.SELECT.LINE*n*	R/W	"ON" or "OFF"	Enables/disables the Audio Loss alarm for this input. Default: OFF
CONF.AUDIO.LOSS.SELECT.MPX*n*	R/W	"ON" or "OFF"	Enables/disables the Audio Loss alarm for this input. Default: OFF
CONF.AUDIO.LOSS.SELECT.PLAYER	R/W	"ON" or "OFF"	Enables/disables the Audio Loss alarm for this input. Default: OFF
CONF.AUDIO.LOSS.TRIG	R/W	"NONE" or "FAULT" or "WARNING"	Type of alarm triggered on audio loss. Default: NONE. Note: NONE does not suppress the alarm.
CONF.CROSSFADE	R/W	0 to 25.5	Crossfade between audio channels (in seconds). Enter 1 for optimal configuration.
CONF.DEV.AUDIO	R/W	0…150	Sets the audio excursion
CONF.DEV.CLIP	R/W	0 to 200	Set the excursion clipping in kHz ; +128 = disabled limitation
CONF.DEV.LIMIT	R/W	0 to 200	Set the MPX excursion limitation; +128 = disabled limitation
CONF.DEV.MPX	R/W	00000 à 150.00	Sets the MPX excursion
CONF.DEV.MPXPWR	R/W	-12.7…12.7	Set the MPX power limitation; +128 = disabled limitation
CONF.DEV.PILOT	R/W	0 to 25.5	Sets the pilot excursion
CONF.DEV.RDS	R/W	0 to 25.5	Sets the RDS excursion
CONF.DEV.RDS.COR	R/W	"ON" ou "OFF"	Enables/disables the SmartFM RDS correction
CONF.DEV.SCA	R/W	0 to 25.5	Sets the SCA excursion
CONF.EXC_TEMP.MAX	R/W	0…99	Sets the triggering threshold for the exciter temperature alarm
CONF.FADEIN	R/W	0 to 25.5	Sets the fade-in for audio channels in seconds
CONF.FREQ *	R/W	"ON" or "OFF"	Gives the exciter's working frequency in kHz
CONF.FSK.ID	R/W	[0..9][A…Z][a…z][-]	Code to transmit in Morse, default value: empty string
CONF.FSK.REP	R/W	0…255	Number of repetitions of CONF.FSK.ID, default value: 0
CONF.FSK.SHIFT	R/W	[-25…-5][5…25]	Jump in frequency (in kHz), default value: 50
CONF.FSK.SPEED	R/W	0…25	Speed in group number (5 characters base), default value: 5

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NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
CONF.HEAT.MAX	R/W	[0..99]	Sets the triggering threshold for the heatsink 1 temperature alarm
CONF.INT_TEMP.MAX **	R/W	0…99	Sets the triggering threshold for the temperature alarm of the internal sensor
CONF.MODE *	R	"LOCAL" or "REMOTE"	Indicates the mode, local or remote. Available in R/W on amplifiers.
CONF.PHASE.PILOT	R/W	-180..+180	Sets the pilot phase
CONF.PHASE.RDS	R/W	-180..+180	Sets the RDS phase
CONF.PRESSURE.MIN **	R/W	0…2000	Sets the triggering threshold for the pressure alarm of the internal sensor
CONF.PROBE.PFWD	R/W	[0….9999]	Adjusts the forward power of the RF probe. Nominal value: 1000.
CONF.PROBE.PREF	R/W	[0….9999]	Adjusts the reflected power of the RF probe. Nominal value: 1000.
CONF.PSU_TEMP.MAX	R/W	[0..99]	Sets the triggering threshold of the PSU temperature alarm
CONF.PWR *	R/W	[0..999]	Sets the output power. From 0 to 9999
CONF.PWR_MAX *	R/W	[0..99999]	Sets the max power of the transmitter CONF.PWR. Limited by SYS.PAVL
CONF.RF	R/W	"ON" or "OFF"	ON => Enable RF OFF => Disables RF
CONF.RFPRESENT.MIN *	R/W	[0..999]	STAT.RF (presence RF) triggering threshold; default value: 0
CONF.SBY *	R/**W**	"ON" or "OFF"	Enables the standby mode. Read only for Ecreso FM
CONF.SFM.STATE	R/W	"ON" or "OFF"	Enables/disables the SmartFM function
CONF.SFM.MODE	R/W	STANDARD, SAVINGS, SAVINGS SOFT, BOOST, LIMITED	SmartFM strategy
CONF.SFN.DELAY	R/W	0… 5000000.00	SFN delay in µs. Can be set in 1,25 µs increments
CONF.SP.PRESET.NUM	R/W	0…12	Preset number for sound processing
CONF.SP.BYPASS	R/W	"ON" or "OFF"	Enables/disables Sound processing
CONF.SP.PRESET.NAME	R/W	XXXX X=[0..9;A…Z]	Returns/edits the name of the current preset
CONF.SP.PRESET.NAME.*n*	R	XXXX X=[0..9;A…Z]	Returns/edits the name of preset ***n***. ***n*** = 1 to 12
CONF.STATE.CLIP	R/W	"ON" or "OFF"	Enables/disables the Hard Clipper
CONF.STATE.LIMIT	R/W	"ON" or "OFF"	Enables/disables the FM limiter
CONF.STATE.MPXPWR	R/W	"ON" or "OFF"	Enables/disables the MPX Power limiter
CONF.VSWR.MAX *	**R/W**	**XX.X X=[0..9]**	**Set the VSWR alarm threshold. Use a 3 digit value. "020" => VSWR = 2. You cannot sent "2" or "1.4".**
CONF.VSWR_TRIG	R/W	"WARNING" or "FAULT/WARN" or "FAULT"	Working mode in case of VSWR overshoot. WARNING = triggers a simple Warning. WARN/FAULT = triggers a fault but does not trigger the reflected protection. FAULT = triggers a fault and the reflected protection triggers a VSWR fault. Default value: FAULT
CONF.VSWRTRIP *	R/W	"ON" or "OFF"	Enables/disables reflected power safety

Commands related to options are only available when the option is present.

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7.2.5. Alarm commands

Greyed out commands are Ecreso FM only commands.

Commands in bold are Ecreso FM Amplifier and Ecreso FM with integrated amplifier (300 W to 2000 W) only commands.

Commands followed by two stars (**) are available with modules sold in v.1.2.2 or higher.

NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
ALARM.10MSWITCH	R	"ON" or "OFF"	Indicates there was a 10 MHz switch between the external source and the internal source.
ALARM.1DB	R	"ON" or "OFF"	ON =>1 dB Alarm, OFF => => No alarm. TX is RF ON and the current forward power is below the set 1dB power threshold (which can be user-set)
ALARM.3DB	R	"ON" or "OFF"	ON =>3 dB Alarm, OFF => => No alarm. TX is RF ON and the current forward power is below the set 3dB power threshold (which can be user-set)
ALARM.AMB	R	"ON" or "OFF"	ON => ambient alarm, OFF => No alarm. The current ambient temperature is above the set maximum ambient temperature (CONF.AMB.MAX)
ALARM.AUDIO.LOSS	R	"ON" or "OFF"	ON =>Audio loss Alarm, OFF => => No alarm. The alarm is triggered when there is audio loss on any of the inputs as set with the commands CONF.AUDIO.LOSS.SELECT.*xxx*
ALARM.BATLOW	R	"ON" or "OFF"	Indicates if the NVRAM battery's level is OK. ON: the NVRAM battery needs to be changed.
ALARM.COMM	R	"ON" or "OFF"	Indicates if there is a communication fault with one of the units of the system. Only applies to Master unit of modular TX and 1+1 systems.
ALARM.CUR1	R	"ON" or "OFF"	Indicates the MOSFET 1 current supplied by the PSU current is over the max threshold.
ALARM.CUR2	**R**	**"ON" or "OFF"**	**Indicates the MOSFET 2 current supplied by the PSU is over the max threshold. (1500 & 2000 W modules only)**
ALARM.EXC_TEMP	R	"ON" or "OFF"	ON => indicates the temperature of the exciter is higher than the max threshold
ALARM.FAN1	R	"ON" or "OFF"	Fan 1 alarm; speed is too slow
ALARM.FAN2	R	"ON" or "OFF"	Fan 2 alarm; speed is too slow (1500 & 2000 W modules only)
ALARM.FAULT	R	"ON" or "OFF"	ON => critical alarm OFF => => No alarm (3 dB, VSWR)
ALARM.HEAT1	R	"ON" or "OFF"	ON => The heatsink temperature around MOSFET1 is over the set heatsink max temperature (CONF.HEAT.MAX)
ALARM.HEAT2	R	"ON" or "OFF"	ON => The heatsink temperature around MOSFET2 is over the set heatsink max temperature (CONF.HEAT.MAX) (1500 & 2000 W modules only)
ALARM.INT_TEMP **	R	"ON" or "OFF"	ON => indicates the temperature of the internal sensor is higher than the max threshold
ALARM.INPUT_FAULT	R	"ON" or "OFF"	Indicates if there is an alarm on an input seta as FAULT
ALARM.INPUTSWITCH	R	"ON" or "OFF"	Indicates if the current audio input corresponds to the highest priority channel
ALARM.LINE1	R	"ON" or "OFF"	ON => no signal on the input LINE1
ALARM.LINE2	R	"ON" or "OFF"	ON => no signal on the input LINE2
ALARM.LIST	R		Returns the list of current alarms in ASCII format
ALARM.LOGGING	R	"ON" or "OFF"	ON => two consecutive failed attempts to write on the µSD card

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NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
ALARM.MPX1	R	"ON" or "OFF"	ON => no signal on the input MPX1
ALARM.MPX2	R	"ON" or "OFF"	ON => no signal on the input MPX2
ALARM.MPX3	R	"ON" or "OFF"	ON => no signal on the input MPX3
ALARM.MPX4	R	"ON" or "OFF"	ON => no signal on the input MPX4
ALARM.OVDR	R	"ON" or "OFF"	Indicates whether the input power on the MOSFET is too high (ON) or not (OFF)
ALARM.PIN	**R**	**"ON" or "OFF"**	**Indicates that the input power on the MOSFET is too low**
ALARM.PLAYER	R	"ON" or "OFF"	ON => no signal on the generator
ALARM.PLL	R	"ON" or "OFF"	Indicates whether the PLL is locked (OFF) or unlocked (ON)
ALARM.PRESSURE **	R	"ON" or "OFF"	ON => indicates the pressure of the internal sensor is higher than the max threshold
ALARM.PSU_TEMP	R	"ON" or "OFF"	ON => PSU temperature alarm on, OFF=> no alarm
ALARM.RDSSWITCH	R	"ON" or "OFF"	Indicates there was a RDS switch (auto mode only)
ALARM.SFM	R	"ON" or "OFF"	Indicates a SmartFM malfunction
ALARM.SFN	R	"ON" or "OFF"	When SFN is enabled, indicates a loss of the external 10 MHz or a loss of the external 1 PPS or a difference between the set SFN delay and the measured SFN delay. This alarm indicates a loss of SFN, not a loss of transmission.
ALARM.SUPPLY1	R	"ON" or "OFF"	PSU 1 state
ALARM.SUPPLY2	**R**	**"ON" or "OFF"**	**PSU 2 state (1500 & 2000 W modules only)**
ALARM.TEMP1	R	"ON" or "OFF"	ON => temp alarm (thermocoupler) OFF => No alarm
ALARM.TEMP2	**R**	**"ON" or "OFF"**	**ON => temp alarm (thermocoupler) OFF => No alarm (1500 & 2000 W modules only)**
ALARM.TEMP3	**R**	**"ON" or "OFF"**	**ON => temp alarm (thermocoupler) OFF => No alarm (2000 W modules only)**
ALARM.TEMP4	**R**	**"ON" or "OFF"**	**ON => temp alarm (thermocoupler) OFF => No alarm (2000 W modules only)**
ALARM.VOLT.AUX	R	"ON" or "OFF"	Indicates if auxiliary voltage is offset by more than 10% of the set value
ALARM.VOLT1	R	"ON" or "OFF"	ON => main PSU voltage reaching MOSFET 1 is offset by more than 10% of the expected value
ALARM.VOLT2	**R**	**"ON" or "OFF"**	**ON => main PSU voltage reaching MOSFET 2 is offset by more than 10% of the expected value (1500 & 2000 W modules only)**
ALARM.VSWR	R	"ON" or "OFF"	ON => VSWR Alarm, OFF => No VSWR alarm
ALARM.VSWRTRIP	**R**	**"ON" or "OFF"**	**Indicates if there has been a VSWR trip fault**
ALARM.WARN	R	"ON" or "OFF"	ON =>Internal Alarm (warnings) OFF=> No alarm. (fan, current, voltage, power supply, temperature, heatsink, ambient temp)

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7.2.6. Input commands

These commands are Ecreso FM only commands.

NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
INPUT.AUDIOGEN.FREQ	R/W	0 ~ 100000.00	Delta phase = freq audio / 200000
INPUT.AUDIOGEN.LEVEL	R/W	-100.00 ~ 12.00	Audio level
INPUT.AUDIOGEN.PREAC	R/W	"0" or "50" or "75"	Sets the value of the pre-emphasis
INPUT.AUDIOGEN.STATE	R/W	"OFF" or "L" or "R" or "L+R" or "L-R"	Type of generated MPX signal
INPUT.LINE1.ALARM	R/W	"NONE" or "FAULT" or "WARNING"	Alarm generated upon loss of signal on the input
INPUT.LINE1.DRIVE	R/W	-6.00 to 6.00	Drive setting, allows an increase of the input audio level without changing the deviation setting.
INPUT.LINE1.FLT	R/W	"0" or "15" or "16" or "17"	Configuration of the audio filter
INPUT.LINE1.GET_SAMPLING	R	0…200000	Gives the sampling rate in Hz
INPUT.LINE1.LEFT.PEAK	R	-100 … 28	Gives the left audio input max peak value over 100 milliseconds
INPUT.LINE1.LEFT.PKMAX	R	-100 … 28	Gives the left audio input max peak value over 1 second.
INPUT.LINE1.LEVEL	R/W	-20.00...18.00	Internal numerical gain. For AES, between -20 and 0; for ANA between -18 and +18
INPUT.LINE1.LOST	R	"YES" or "NO"	Detection of silence on the input after timeout. If 'Yes', an alarm may be sent depending on the setting for INPUT.LINE1.ALARM.
INPUT.LINE1.PREAC	R/W	0;50;75	Sets the value of the pre-emphasis
INPUT.LINE1.PRESENCE	R	"NONE" or "L" or "R" or "L&R"	Indicates audio signals are present on input 1
INPUT.LINE1.RIGHT.PEAK	R	-100 … 28	Gives the right audio input max peak value over 100 milliseconds
INPUT.LINE1.RIGHT.PKMAX	R	-100 … 28	Gives the right audio input max peak value over 1 second.
INPUT.LINE1.SW.BACKDELAY	R/W	XXX=[0…30]	Back delay on the channel with the highest configurable priority.
INPUT.LINE1.SW.DELAY	R/W	XXX=[1…180]	Switching delay when loss of audio 1
INPUT.LINE1.SW.NOSYNC	R/W	"ON" or "OFF"	If ON, switches on loss of AES synchro
INPUT.LINE1.SW.PRIO	R/W	0..7 ; 0=disabled	Priority of each audio channel (7= highest priority)
INPUT.LINE1.SW.SILENCE	R/W	"L" or "R" or "ANY" or "BOTH"	Sets on which channel silence detection must be conducted for the audio input 1: L, R, L or R (ANY), L and R (BOTH)
INPUT.LINE1.SW.THRESH	R/W	-90…000	Silence triggering level in dBFS on channel 1
INPUT.LINE1.TRIM	R/W	-3.00 to 3.00	Sets the offset between left and right channels (+3 = left channel level is 3 dBu higher than right channel level)
INPUT.LINE1.TYPE	R	"ANA" or "AES" "OFF"	Indicates the type of audio signals present on input 1
INPUT.LINE2.ALARM	R/W	"NONE" or "FAULT" or "WARNING"	Alarm generated upon loss of signal on the input
INPUT.LINE2.DRIVE	R/W	-6.00 to 6.00	Drive setting, allows an increase of the input audio level without changing the deviation setting.
INPUT.LINE2.FLT	R/W	0;1;2 0=15;1=16;2=17	Configuration of the audio filter
INPUT.LINE2.GET_SAMPLING	R	0…200000	Gives the sampling rate in Hz
INPUT.LINE2.LEFT.PEAK	R	-100 … 28	Gives the right audio input max peak value over 100 milliseconds
INPUT.LINE2.LEFT.PKMAX	R	-100 … 28	Gives the right audio input max peak value over 1 second.
INPUT.LINE2.LEVEL	R/W	-20.00...18.00	Internal numerical gain. For AES, between -20 and 0; for ANA between -18 and +18
INPUT.LINE2.LOST	R	"YES" or "NO"	Detection of silence on the input after timeout. If 'Yes', an alarm may be sent depending on the setting for INPUT.LINE2.ALARM.
INPUT.LINE2.PREAC	R/W	0;50;75	Sets the value of the pre-emphasis
INPUT.LINE2.PRESENCE	R	"NONE" or "L" or "R" or "L&R"	Indicates audio signals are present on input 2

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NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
INPUT.LINE2.RIGHT.PEAK	R	-100 … 28	Gives the right audio input max peak value over 100 milliseconds
INPUT.LINE2.RIGHT.PKMAX	R	-100 … 28	Gives the right audio input max peak value over 1 second
INPUT.LINE2.SW.BACKDELAY	R/W	XXX=[0…30]	Back delay on the channel with the highest configurable priority.
INPUT.LINE2.SW.NOSYNC	R/W	"ON" or "OFF"	If ON, switches on loss of AES synchro
INPUT.LINE2.SW.DELAY	R/W	XXX=[1…180]	Switching delay when loss of audio 2
INPUT.LINE2.SW.PRIO	R/W	0..7 ; 0=disabled	Priority of each audio channel (7= highest priority)
INPUT.LINE2.SW.SILENCE	R/W	"L" or "R" or "ANY" or "BOTH"	Sets on which channel silence detection must be conducted for the audio input 2: L, R, L or R (ANY), L and R (BOTH)
INPUT.LINE2.SW.THRESH	R/W	-90…000	Silence triggering level in dBFS on channel 2
INPUT.LINE2.TRIM	R/W	-3.00 to 3.00	Sets the offset between left and right channels (+3 = left channel level is 3 dBu higher than right channel level)
INPUT.LINE2.TYPE	R	"ANA" or "AES" "OFF"	Indicates the type of audio signals present on input 2
INPUT.MPX.SW.BACKDELAY	R/W	XXX=[0…30]	Back delay on the channel with the highest configurable priority.
INPUT.MPX.SW.DELAY	R/W	XXX=[1…180]	Switching delay when loss on the MPX input
INPUT.MPX1.ALARM	R/W	"NONE" or "FAULT" or "WARNING"	Alarm generated upon loss of signal on the input
INPUT.MPX1.DRIVE	R/W	-6.00 to 6.00	Drive setting, allows an increase of the input audio level without changing the deviation setting.
INPUT.MPX1.GET_SAMPLING	R	0…200000	Gives the sampling rate in Hz
INPUT.MPX1.LEVEL	R/W	-18.00...+18.00	Internal numerical gain
INPUT.MPX1.LOST	R	"YES" or "NO"	Detection of silence on the input after timeout. If 'Yes', an alarm may be sent depending on the setting for INPUT.MPX1.ALARM.
INPUT.MPX1.PEAK	R	-150…150	Gives the deviation max peak value of the transmitted signal in kHz over 100 milliseconds
INPUT.MPX1.PKMAX	R	-150…150	Gives the deviation max peak value of the transmitted signal in kHz over 1 second
INPUT.MPX1.PRESENCE	R	MO" or "MO+R" or "MO+R+S" or "ST" or "ST+R" or "ST+R+S"	Gives the composition of MPX1 on channel 3. R = RDS ; MO = Mono ; ST = Stereo ; S = SCA
INPUT.MPX1.SW.PRIO	R/W	0..7 ; 0=disabled	Priority of each audio channel (4= highest priority)
INPUT.MPX1.SW.THRESH	R/W	-90…000	Silence triggering level in dBFS
INPUT.MPX2.ALARM	R/W	"NONE" or "FAULT" or "WARNING"	Alarm generated upon loss of signal on the input
INPUT.MPX2.DRIVE	R/W	-6.00...6.00	Drive setting, allows an increase of the input audio level without changing the deviation setting.
INPUT.MPX2.GET_SAMPLING	R	0…200000	Gives the sampling rate in Hz
INPUT.MPX2.LEVEL	R/W	-18.00...+18.00	Internal numerical gain
INPUT.MPX2.LOST	R	"YES" or "NO"	Detection of silence on the input after timeout. If 'Yes', an alarm may be sent depending on the setting for INPUT.MPX2.ALARM.
INPUT.MPX2.PEAK	R	-150…150	Gives the deviation max peak value of the transmitted signal in kHz over 100 milliseconds
INPUT.MPX2.PKMAX	R	-150...150	Gives the deviation max peak value of the transmitted signal in kHz over 1 second
INPUT.MPX2.PRESENCE	R	MO" or "MO+R" or "MO+R+S" or "ST" or "ST+R" or "ST+R+S"	Gives the composition of MPX2 on channel 3. R = RDS ; MO = Mono ; ST = Stereo ; S = SCA
INPUT.MPX2.SW.PRIO	R/W	0..7 ; 0=disabled	Priority of each audio channel (4= highest priority)
INPUT.MPX2.SW.THRESH	R/W	-90…000	Silence triggering level in dBFS
INPUT.MPX3.ALARM	R/W	"NONE" or "FAULT" or "WARNING"	Alarm generated upon loss of signal on the input
INPUT.MPX3.DRIVE	R/W	-6.00 to 6.00	Drive setting, allows an increase of the input audio level without changing the deviation setting.
INPUT.MPX3.GET_SAMPLING	R	0…200000	Gives the sampling rate in Hz

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NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
INPUT.MPX3.LEVEL	R/W	-18.00...+18.00	Internal numerical gain
INPUT.MPX3.LOST	R	"YES" or "NO"	Detection of silence on the input after timeout. If 'Yes', an alarm may be sent depending on the setting for INPUT.MPX3.ALARM.
INPUT.MPX3.PEAK	R	-150…150	Gives the deviation max peak value of the transmitted signal in kHz over 100 milliseconds
INPUT.MPX3.PKMAX	R	-150…150	Gives the deviation max peak value of the transmitted signal in kHz over 1 second
INPUT.MPX3.PRESENCE	R	MO" or "MO+R" or "MO+R+S" or "ST" or "ST+R" or "ST+R+S"	Gives the composition of MPX3 on channel 3. R = RDS ; MO = Mono ; ST = Stereo ; S = SCA
INPUT.MPX3.SW.PRIO	R/W	0..7 ; 0=disabled	Priority of each audio channel (4= highest priority)
INPUT.MPX3.SW.THRESH	R/W	-90…000	Silence triggering level in dBFS
INPUT.MPX34.SW.BACKDELAY	R/W	XXX=[0…30]	Back delay on the channel with the highest configurable priority.
INPUT.MPX34.SW.DELAY	R/W	XXX=[1…180]	Switching delay when loss on the MPX input
INPUT.MPX34.SW.NOSYNC	R/W	"ON" or "OFF"	If ON, switches on loss of AES synchro
INPUT.MPX4.ALARM	R/W	"NONE" or "FAULT" or "WARNING"	Alarm generated upon loss of signal on the input
INPUT.MPX4.DRIVE	R/W	-6.00...6.00	Drive setting, allows an increase of the input audio level without changing the deviation setting.
INPUT.MPX4.GET_SAMPLING	R	0…200000	Gives the sampling rate in Hz
INPUT.MPX4.LEVEL	R/W	-18.00...+18.00	Internal numerical gain
INPUT.MPX4.LOST	R	"YES" or "NO"	Detection of silence on the input after timeout. If 'Yes', an alarm may be sent depending on the setting for INPUT.MPX4.ALARM.
INPUT.MPX4.PEAK	R	-150…150	Gives the deviation max peak value of the transmitted signal in kHz over 100 milliseconds
INPUT.MPX4.PKMAX	R	-150...150	Gives the deviation max peak value of the transmitted signal in kHz over 1 second
INPUT.MPX4.PRESENCE	R	MO" or "MO+R" or "MO+R+S" or "ST" or "ST+R" or "ST+R+S"	Gives the composition of MPX4 on channel 3. R = RDS ; MO = Mono ; ST = Stereo ; S = SCA
INPUT.MPX4.SW.PRIO	R/W	0..7 ; 0=disabled	Priority of each audio channel (4= highest priority)
INPUT.MPX4.SW.THRESH	R/W	-90…000	Silence triggering level in dBFS
INPUT.PLAYER.ALARM	R/W	"NONE" or "FAULT" or "WARNING"	Alarm generated upon loss of signal on the input
INPUT.PLAYER.DRIVE	R/W	-6.00 to 6.00	Drive setting, allows an increase of the input audio level without changing the deviation setting.
INPUT.PLAYER.FLT	R/W	"0" or "15" or "16" or "17"	Configuration of the audio filter
INPUT.PLAYER.GET_SAMPLING	R	0…200000	Gives the sampling rate in Hz
INPUT.PLAYER.LEFT.PEAK	R	-100 … 28	Gives the left audio input max peak value over 100 milliseconds
INPUT.PLAYER.LEFT.PKMAX	R	-100 … 28	Gives the left audio input max peak value over 1 second.
INPUT.PLAYER.LEVEL	R/W	-20.00...18.00	Internal numerical gain.
INPUT.PLAYER.LOST	R	"YES" or "NO"	Detection of silence on the input after timeout. If 'Yes', an alarm may be sent depending on the setting for INPUT.PLAYER.ALARM.
INPUT.PLAYER.PREAC	R/W	0;50;75	Sets the value of the pre-emphasis
INPUT.PLAYER.PRESENCE	R	"NONE" or "L" or "R" or "L&R"	Indicates audio signals are present on the generator
INPUT.PLAYER.RIGHT.PEAK	R	-100 … 28	Gives the right audio input max peak value over 100 milliseconds
INPUT.PLAYER.RIGHT.PKMAX	R	-100 … 28	Gives the right audio input max peak value over 1 second.
INPUT.PLAYER.SAMPLING	R/W	"44" ou "48" ou "96"	Gives the sampling rate
INPUT.PLAYER.SW.BACKDELAY	R/W	XXX=[0…30]	Back delay on the channel with the highest configurable priority.
INPUT.PLAYER.SW.DELAY	R/W	XXX=[1…180]	Switching delay when loss of audio
INPUT.PLAYER.SW.NOSYNC	R/W	"ON" or "OFF"	If ON, switches on loss of AES synchro
INPUT.PLAYER.SW.PRIO	R/W	0..7 ; 0=disabled	Priority of each audio channel (7= highest priority)

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NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
INPUT.PLAYER.SW.SILENCE	R/W	"L" or "R" or "ANY" or "BOTH"	Sets on which channel silence detection must be conducted for the audio input 1: L, R, L or R (ANY), L and R (BOTH)
INPUT.PLAYER.SW.THRESH	R/W	-90…000	Silence triggering level in dBFS on generator signal
INPUT.PLAYER.TRIM	R/W	-3.00 to 3.00	Sets the offset between left and right channels (+3 = left channel level is 3 dBu higher than right channel level)

7.2.7. Encoder commands

These commands are Ecreso FM only commands.

NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
CODER.19KOUT.LEVEL	R/W	0…8; 0=OFF	Enables/disables and sets the rear panel 19 kHz level output
CODER.CURRENT.AUDIO	R	"AUTO" or "LINE1" or "LINE2" or "MPX1" or "MPX2" or "PLAYER" or "GENE"	Indicates the audio channel used by the exciter.
CODER.CURRENT.RDS	R	"NONE" or "MPX1" or "MPX2" or "INTERNAL"	Indicates the RDS channel used by the exciter.
CODER.CURRENT.SCA	R	"NONE" or "MPX1" or "MPX2" or "INTERNAL"	Indicates the SCA channel used by the exciter.
CODER.MOST	R/W	"STEREO" or "MONO" or "MONO_L" or "MONO_R"	Configuration of the audio on MPX
CODER.RDS.BACKUP	R/W	"YES" or "NO"	Switch to internal RDS in case of loss of the selected RDS channel.
CODER.SELECT.AUDIO	R/W	"AUTO" or "LINE1" or "LINE2" or "MPX1" or "MPX2" or "PLAYER" or "GENE"	Selects the audio channel. 'AUTO': the audio input depends on the input switch parameters (see section 5.4).
CODER.SELECT.RDS	R/W	"OFF" or "MPX1" or "MPX2" or "INTERNAL" or "AUTO"	Selects the RDS channel. 'OFF' disables the RDS, 'AUTO' selects the RDS source according to the selected audio channel (see section 5.12).
CODER.SELECT.SCA	R/W	"OFF" or "MPX1" or "MPX2" or "AUTO"	Selects the SCA channel. 'OFF' disables the SCA, 'AUTO' selects the SCA source according to the selected audio channel (see section 5.12).

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7.2.8. RDS commands

These commands are Ecreso FM only commands.

NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
PS_TEXT	R/W	ascii [0x21…0x7E]	Dynamically sets the first line of PS text. Text with Tags <ITEM.TITLE>, <ITEM.ARTIST>, … Equivalent to RDS.PS1.TXT
RDS.ALTDSN.AF	R/W	XX,…,XX XX=[87.5 ~108.00]	List of alternative frequencies (26 max). Enter frequencies as 5 character values. Ex: 89.70 or 103.2
RDS.ALTDSN.DI	R/W	0~15	Numerical function that drives an RDS receiver's audio stage to adjust audio decoding depending on the type of audio channel (mono, stereo, ...)
RDS.ALTDSN.GS	R/W	XX;;XX XX=service	Group sequence: 0A => 0, 2A=>4, 10A=>20 (32 max)
RDS.ALTDSN.ID	R/W	X; X=[1…8]	Indicates which DSN sent by UECP is copied to the ALT memory
RDS.ALTDSN.MS	R/W	"0" or "1"	Numerical flag that automatically modifies the sound level of an RDS receiver depending on the broadcast program (1 = music, 0 = speech)
RDS.ALTDSN.PI	R/W	XXXX X=[0..9;A…F]	Enables RDS to identify the station when searching the frequency using AF or EON-AF code
RDS.ALTDSN.PS	R/W	XXXX X=[0..9;A…Z]	Station name; with 8 characters
RDS.ALTDSN.PTY	R/W	0~31	Program type as set by the RDS standard
RDS.ALTDSN.PTYN	R/W	XXXX X=[0..9;A…Z]	Program type name
RDS.ALTDSN.RT	R/W	X..X ; X=[0..9;A..Z]	Radiotext
RDS.ALTDSN.TATP	R/W	"OFF" or "TA" or "TP" or "TATP"	Enables/disables TA and TP services
RDS.APPOINTMENT.STR	R/W	[A…Z]	Sets the command that modifies <APPOINTMENT>; default value: APPOINTEMENT
RDS.CHAT.CENTER.STR	R/W	[A…Z]	Sets the command that modifies <CHAT.CENTER>; default value: CHATCENTRE
RDS.CHAT.STR	R/W	[A…Z]	Sets the command that modifies <CHAT>; default value: CHAT
RDS.CT.EN	R/W	"ON" or "OFF"	Enables/disables the Clock time function
RDS.CT.OFFSET	R/W	-24---24	Time offset in number of 30 minute periods. Ex: for an offset of 90 minutes, set 3
RDS.CURRENT.PS	R	[A…Z]	Current PS string
RDS.CURRENT.RT	R	[A…Z]	Current radiotext string
RDS.DSN	R/W	"MAIN" or "ALT"	Transmit the DSN 1 or 2 to the exciter
RDS.EMAIL.HOTLINE.STR	R/W	[A…Z]	Sets the command that modifies <EMAIL.HOTLINE>; default value: EMAILHOTLINE
RDS.EMAIL.OTHER.STR	R/W	[A…Z]	Sets the command that modifies <EMAIL.OTHER>; default value: EMAILOTHER
RDS.EMAIL.STUDIO.STR	R/W	[A…Z]	Sets the command that modifies <EMAIL.STUDIO>; default value: EMAILSTUDIO
RDS.GET_DATA.STR	R/W	[A…Z]	Sets the command that modifies <GET_DATA>; default value: GETDATA
RDS.IDENTIFIER.STR	R/W	[A…Z]	Sets the command that modifies <IDENTIFIER>; default value: IDENTIFIER
RDS.INFO.ADVERTISEMENT.STR	R/W	[A…Z]	Sets the command that modifies <INFO.ADVERTISEMENT>; default value: ADVERTISEMENT
RDS.INFO.ALARM.STR	R/W	[A…Z]	Sets the command that modifies <INFO.ALARM>; default value: ALARMINFO
RDS.INFO.CINEMA.STR	R/W	[A…Z]	Sets the command that modifies <INFO.CINEMA>; default value: CINEMA
RDS.INFO.DAILY_DIVERSION.STR	R/W	[A…Z]	Sets the command that modifies <INFO.DAILY_DIVERSION>; default value: DAILYDIVERSION
RDS.INFO.DATE_TIME.STR	R/W	[A…Z]	Sets the command that modifies <INFO.DATE_TIME>; default value: DATETIME

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NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
RDS.INFO.EVENT.STR	R/W	[A…Z]	Sets the command that modifies <INFO.EVENT>; default value: EVENT
RDS.INFO.HEALTH.STR	R/W	[A…Z]	Sets the command that modifies <INFO.HEALTH>; default value: HEALTH
RDS.INFO.HOROSCOPE.STR	R/W	[A…Z]	Sets the command that modifies <INFO.HOROSCOPE>; default value: HOROSCOPE
RDS.INFO.LOTTERY.STR	R/W	[A…Z]	Sets the command that modifies <INFO.LOTTERY>; default value: LOTTERY
RDS.INFO.NEWS.LOCAL.STR	R/W	[A…Z]	Sets the command that modifies <INFO.NEWS.LOCAL>; default value: LOCALNEWS
RDS.INFO.NEWS.STR	R/W	[A…Z]	Sets the command that modifies <INFO.NEWS>; default value: NEWS
RDS.INFO.OTHER.STR	R/W	[A…Z]	Sets the command that modifies <INFO.OTHER>; default value: OTHER
RDS.INFO.SCENE.STR	R/W	[A…Z]	Sets the command that modifies <INFO.SZENE>; default value: SCENE
RDS.INFO.SPORT.STR	R/W	[A…Z]	Sets the command that modifies <INFO.SPORT>; default value: SPORT
RDS.INFO.STOCKMARKET.STR	R/W	[A…Z]	Sets the command that modifies <INFO.STOCKMARKET>; default value: STOCKMARKET
RDS.INFO.TRAFFIC.STR	R/W	[A…Z]	Sets the command that modifies <INFO.TRAFFIC>; default value: TRAFFIC
RDS.INFO.TV.STR	R/W	[A…Z]	Sets the command that modifies <INFO.TV>; default value: TVINFO
RDS.INFO.URL.STR	R/W	[A…Z]	Sets the command that modifies <INFO.URL>; default value: URLINFO
RDS.INFO.WEATHER.STR	R/W	[A…Z]	Sets the command that modifies <INFO.WEATHER> ; ; default value: WEATHER
RDS.ITEM.ALBUM.STR	R/W	[A…Z]	Sets the command that modifies <ITEM.ALBUM>; default value: ALBUMNAME
RDS.ITEM.ARTIST.STR	R/W	[A…Z]	Sets the command that modifies <ITEM.ARTIST>; default value: ARTISTNAME
RDS.ITEM.BAND.STR	R/W	[A…Z]	Sets the command that modifies <ITEM.BAND>; default value: BAND
RDS.ITEM.COMMENT.STR	R/W	[A…Z]	Sets the command that modifies <ITEM.COMMENT>; default value: COMMENT
RDS.ITEM.COMPOSER.STR	R/W	[A…Z]	Sets the command that modifies <ITEM.COMPOSER>; default value: COMPOSER
RDS.ITEM.COMPOSITION.STR	R/W	[A…Z]	Sets the command that modifies <ITEM.COMPOSITION>; default value: COMPOSITION
RDS.ITEM.CONDUCTOR.STR	R/W	[A…Z]	Sets the command that modifies <ITEM.CONDUCTOR>; default value: CONDUCTOR
RDS.ITEM.DURATION.STR	R/W	[A…Z]	Sets the command that modifies <ITEM.DURATION>; default value: DURATION
RDS.ITEM.GENRE.STR	R/W	[A…Z]	Sets the command that modifies <ITEM.GENRE>; default value: GENRE
RDS.ITEM.MOVEMENT.STR	R/W	[A…Z]	Sets the command that modifies <ITEM.MOVEMENT>; default value: MOVEMENT
RDS.ITEM.TITLE.STR	R/W	[A…Z]	Sets the command that modifies <ITEM.TITLE>; default value: SONGTITLE
RDS.ITEM.TRACKNUMBER.STR	R/W	[A…Z]	Sets the command that modifies <ITEM.TRACKNUMBER>; default value: TRACKNUMBER
RDS.MAINDSN.AF	R/W	XX,…,XX XX=[87.5 ~108.0]	List of alternative frequencies (26 max). Enter frequencies as 5 character values. Ex: 89.70 or 103.2
RDS.MAINDSN.DI	R/W	0~15	Numerical function that drives an RDS receiver's audio stage to adjust audio decoding depending on the type of audio channel (mono, stereo, ...)
RDS.MAINDSN.GS	R/W	XX;;XX XX=service	Group sequence: 0A => 0, 2A=>4, 10A=>20 (32 max)

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NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
RDS.MAINDSN.ID	R/W	X; X=[1…8]	Indicates which DSN sent by UECP is copied to the MAIN memory
RDS.MAINDSN.MS	R/W	"0" or "1"	Numerical flag that automatically modifies the sound level of an RDS receiver depending on the broadcast program (1 = music, 0 = speech)
RDS.MAINDSN.PI	R/W	XXXX X=[0..9;A…F]	Enables RDS to identify the station when searching the frequency using AF or EON-AF code
RDS.MAINDSN.PS	R/W	XXXX X=[0..9;A…Z]	Station name; with 8 characters
RDS.MAINDSN.PTY	R/W	0~31	Program type as set by the RDS standard
RDS.MAINDSN.PTYN	R/W	XXXX X=[0..9;A…Z]	Program type name
RDS.MAINDSN.RT	R/W	X..X ; X=[0..9;A..Z]	Radiotext
RDS.MAINDSN.TATP	R/W	"OFF" or "TA" or "TP" or "TATP"	Enables/disables TA and TP services
RDS.MMS.OTHER.STR	R/W	[A…Z]	Sets the command that modifies <MMS.OTHER>; default value: MMSOTHER
RDS.PHONE.HOTLINE.STR	R/W	[A…Z]	Sets the command that modifies <PHONE.HOTLINE>; default value: PHONEHOTLINE
RDS.PHONE.OTHER.STR	R/W	[A…Z]	Sets the command that modifies <PHONE.OTHER>; default value: PHONEOTHER
RDS.PHONE.STUDIO.STR	R/W	[A…Z]	Sets the command that modifies <PHONE.STUDIO>; default value: PHONESTUDIO
RDS.PLACE.STR	R/W	[A…Z]	Sets the command that modifies <PLACE>; default value: PLACE
RDS.PROGRAM.EDITORIAL_STAFF.STR	R/W	[A…Z]	Sets the command that modifies <PROGRAMME.EDITORIAL_STAFF>; default value: EDITORIALSTAFF
RDS.PROGRAM.HOMEPAGE.STR	R/W	[A…Z]	Sets the command that modifies <PROGRAMME.HOMEPAGE>; default value: HOMEPAGE
RDS.PROGRAM.HOST.STR	R/W	[A…Z]	Sets the command that modifies <PROGRAMME.HOST>; default value: PROGRAMMEHOST
RDS.PROGRAM.NEXT.STR	R/W	[A…Z]	Sets the command that modifies <PROGRAMME.NEXT>; default value: PROGRAMMENEXT
RDS.PROGRAM.NOW.STR	R/W	[A…Z]	Sets the command that modifies <PROGRAMME.NOW>; default value: PROGRAMMENOW
RDS.PROGRAM.PART.STR	R/W	[A…Z]	Sets the command that modifies <PROGRAMME.PART>; default value: PROGRAMMEPART
RDS.PROGRAM.SUBCHANNEL.STR	R/W	[A…Z]	Sets the command that modifies <PROGRAMME.SUBCHANNEL>; default value: SUBCHANNEL
RDS.PROGRAMME.FREQUENCY.STR	R/W	[A…Z]	Sets the command that modifies <PROGRAMME.FREQUENCY>; default value: FREQUENCY
RDS.PS*n*.CENTER	R/W	ON/OFF	Centered text, only when incrementing by word (*n* = 1 to 8)
RDS.PS*n*.DELAY	R/W	0…99	Delay between 2 consecutive screens (*n* = 1 to 8)
RDS.PS*n*.EN	R/W	ON/OFF	Enables/disables string *n* (*n* = 1 to 8)
RDS.PS*n*.INCREMENT	R/W	[0…8]	From 1 to 8: number of characters per screen. 0 = by word (*n* = 1 to 8)
RDS.PS*n*.REP	R/W	0…16	Sets the number of repetition of string *n*. 0=infinite (*n* = 1 to 8)
RDS.PS*n*.TEXT	R/W	ascii [0x21…0x7E]	Dynamically sets the nth PS scroll line. Text with Tags <ITEM.TITLE>, <ITEM.ARTIST>, … (*n* = 1 to 8)
RDS.PS*n*.TRUNCATE	R/W	ON/OFF	Truncated text, only when incrementing by word (*n* = 1 to 8)
RDS.PURCHASE.STR	R/W	[A…Z]	Sets the command that modifies <PURCHASE>; default value: PURCHASE
RDS.RT1.TEXT	R/W	ascii [0x21…0x7E]	Dynamically sets the radiotext with Tags <ITEM.TITLE>, <ITEM.ARTIST>,…
RDS.SMS.OTHER.STR	R/W	[A…Z]	Sets the command that modifies <SMS.OTHER>; default value: SMSOTHER
RDS.SMS.STUDIO.STR	R/W	[A…Z]	Sets the command that modifies <SMS.STUDIO>; default value: SMSSTUDIO

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NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
RDS.STATIONNAME.LONG.STR	R/W	[A…Z]	Sets the command that modifies <STATIONNAME.LONG>; default value: STATIONNAMELONG
RDS.STATIONNAME.SHORT.STR	R/W	[A…Z]	Sets the command that modifies <STATIONNAME.SHORT>; default value: STATIONNAMESHORT
RDS.VOTE.CENTER.STR	R/W	[A…Z]	Sets the command that modifies <VOTE.CENTER>; default value: VOTECENTRE
RDS.VOTE.QUESTION.STR	R/W	[A…Z]	Sets the command that modifies <VOTE.QUESTION>; default value: VOTEQUESTION
RT.TEXT	R/W	ascii [0x21…0x7E]	Dynamically sets the radiotext with Tags <ITEM.TITLE>, <ITEM.ARTIST>, …Equivalent to the command RDS.RT1.TEXT

7.2.9. Status commands

Commands in bold are Ecreso FM Amplifier and Ecreso FM with integrated amplifier (300 W to 2000 W) only commands.

NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
STAT.10M	R	"PRES" or "NOT PRES"	Indicates the presence of an external 10 MHz
STAT.1PPS	R	"LOCK" or "UNLOCK"	Indicates the presence of an external 1 PPS
STAT.CLK	R	"INTERNAL" or "EXTERNAL"	Indicates the 10 MHz switch position
STAT.CURRENT.IN	R	"1+OPT" or "1+2" or "2+OPT"	Indicates the channels used for channels 1 and 2
STAT.DCOK1	R	"ON" or "OFF"	Indicates if the PSU 1 of the amplifier is "ON" or "OFF"
STAT.INTERLOCK	R	"CLOSE" or "OPEN"	State of the antenna safety loop
STAT.INTERLOCK.LOAD	R	"CLOSE" or "OPEN"	State of the load safety loop
STAT.LINK	R	"OPEN" or "CLOSE"	State of the CAN bus link
STAT.PLL	R	"LOCK" or "UNLOCK"	Indicates the state of the exciter PLL
STAT.PREFMAX	R	"ON" or "OFF"	ON: Max Reflected Power Safety overshoot
STAT.RF	R	"PRES" or "NOT PRES"	RF present at the output of the unit
STAT.SECPIN	R	"ON" or "OFF"	Indicates if the input power is greater than the hardware threshold
STAT.SECPREF	R	"ON" or "OFF"	Indicates if the reflective protection safety is enabled
STAT.SECTEMP1	R	"ON" or "OFF"	State of the temperature safety of the amplifier transistor 1
STAT.SECTEMP2	**R**	**"ON" or "OFF"**	**State of the temperature safety of amplifier transistor 2 (1500 & 2000 W modules only)**
STAT.SFM.ACT	R	"ON" or "OFF"	SmartFM internal activation
STAT.SFM.MAX	R	[25…125]	SmartFM high limit
STAT.SFM.MIN	R	[25…125]	SmartFM low limit
STAT.SWRF	R	"ON" or "OFF"	State of the RF switch

7.2.10. Communication board commands

NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
CAN	R/W	ID,CMD,DATA ; ID=[0…9]; CMD=[0…FF] DATA=[0..9 ; A…Z]"	Gateway between the serial port and the CAN bus. ID=recipient's address; TABLE=table containing the command; CMD=command number; DATA=parameter value. The list of tables/commands is available on request.
CAN.SCAN	R/W		Returns the list of units present of the CAN bus.

Commands related to options are only available when the option is present.

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8. CONFIGURATION WITH THE PC APPLICATION

8.1. Overview

The Engi application enables transmitter's configuration with a simple serial connection to a PC.

It can be downloaded from the WorldCast Systems website.

Once downloaded, extract the .exe file. You do not need to install it, simply double-click on ENGI_REV_xxx.exe to launch the application.

Connect the Ecreso FM front or rear panel serial port to a RS-232 port on the PC using a straight cable with a female connector for the PC and a male connector for the transmitter, or if the IP board is present on the Ecreso FM, connect both the transmitter and the PC to the network.

8.2. Using the application

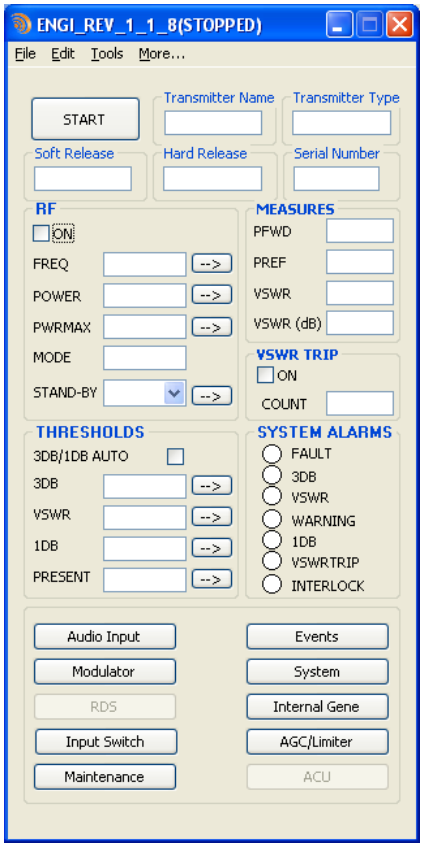
8.2.1. Connection

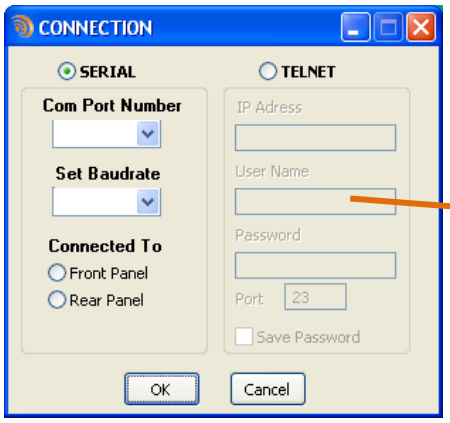
After launching the application, the connection window pops up.

For a serial connection, select the PC COM port and set the rate at 9600 bauds, and indicate which port is used.

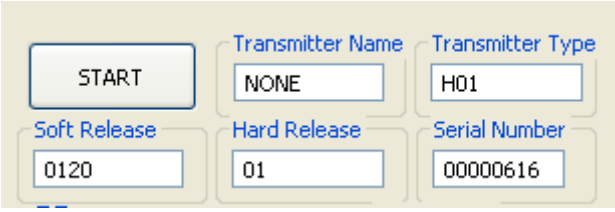
If the transmitter is fitted with an IP interface, you can connect remotely: select TELNET and enter the unit IP address, user name and password as you would to access the embedded web site (see section 9.7.7).

Click the "OK" button.

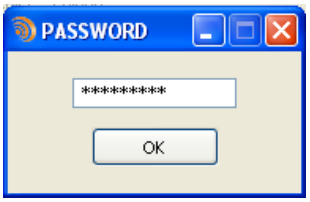




When connected, the unit information is automatically updated.



With a serial connection, if the module is password protected, you will need to enter the password before you can access all the functions.



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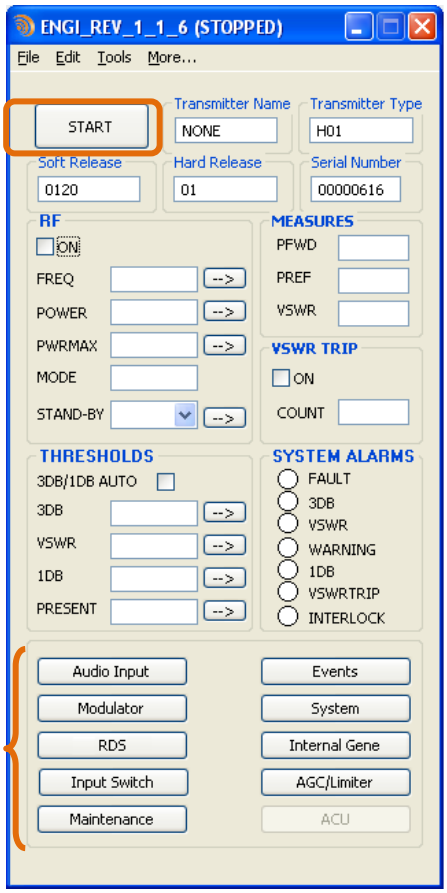

8.2.2. Configuration

Once connected, click the “Start” button to retrieve RF values and thresholds on the main page.

These values are described section 5.3.

Values that can be set are followed by the button -->. Click this button after having updated a value to send it to the transmitter.

A set of buttons give access to other parameters. Click on one of them to open a window displaying associated parameters.

As long as the application is in “Start” mode, current values are retrieved for all open windows.

Clicking “Stop” prevents retrieval of data; however, sending data to the module remains possible.

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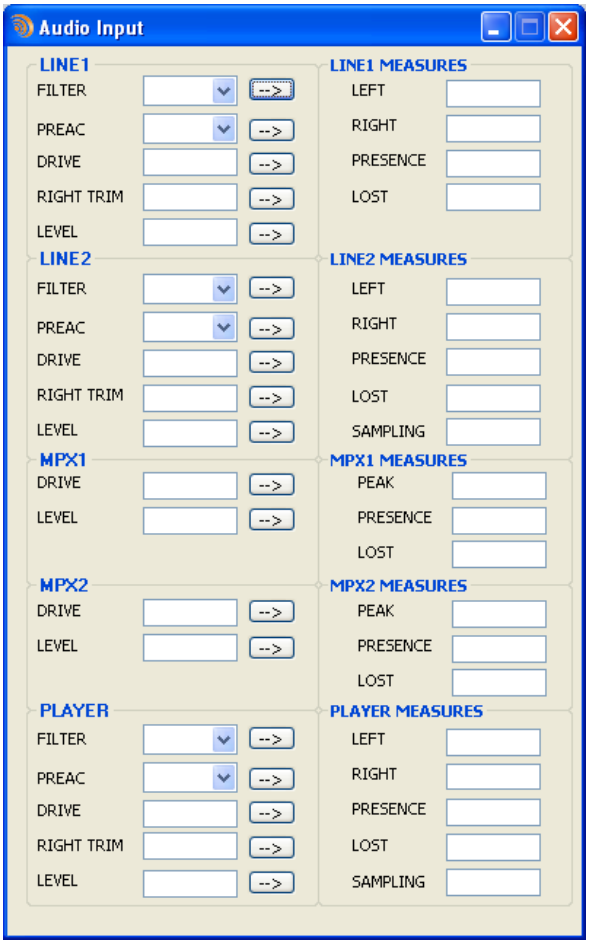
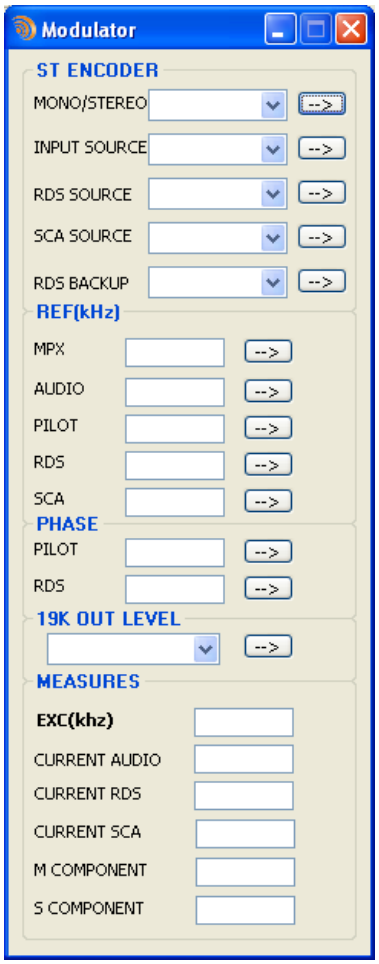
Audio input:



These values are described sections 5.5 to 5.9.



Modulator:

These values are described section 5.10.

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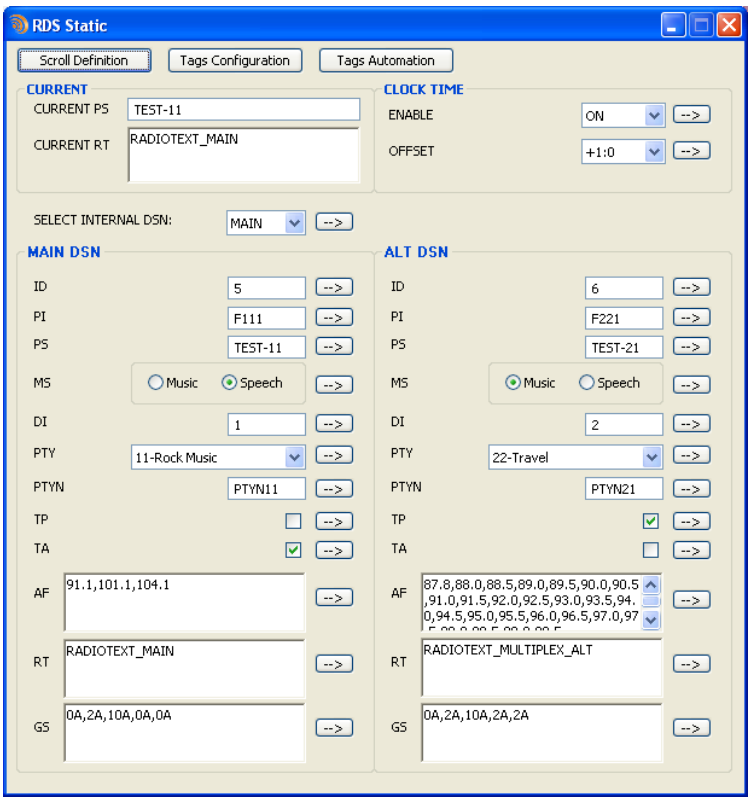
Static RDS:

These values are described section 5.14.

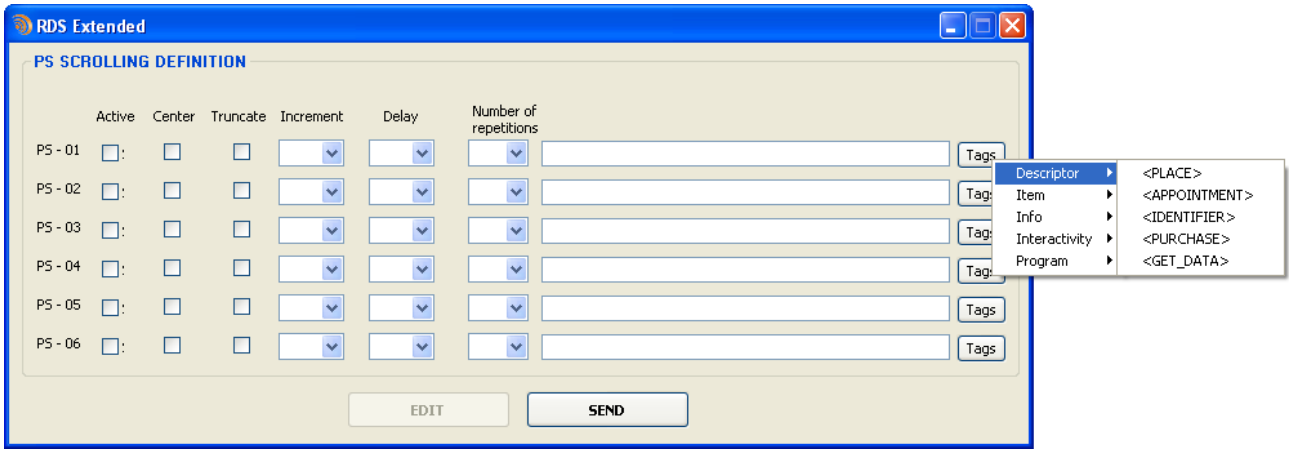
They are only available if the Basic RDS option is enabled.

On the Basic RDS page, set the main DSN and the alternate DSN.

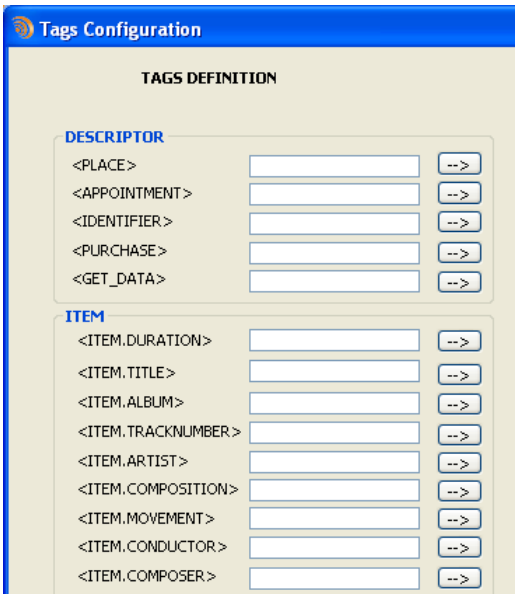
On this page, three buttons give you access to PS scroll management (not available with the front panel application).



Scroll Définition



Dynamic fields can be inserted into all PS lines by clicking the 'Tags' button.



Tags Configuration: current value of dynamic fields.

Tags Automation: command definitions for automation software.

See section 9.5.2 for a complete list of tags.

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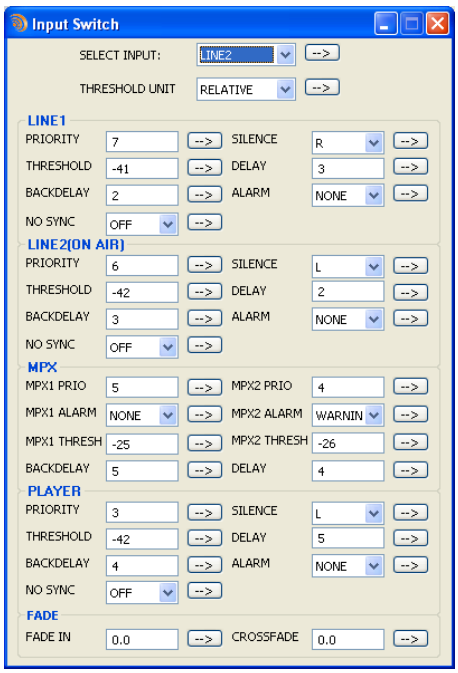
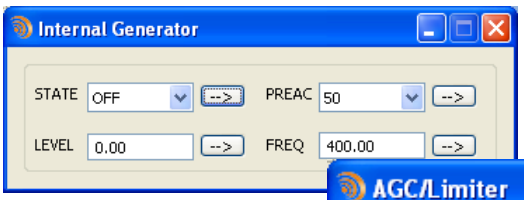
Input Switch:



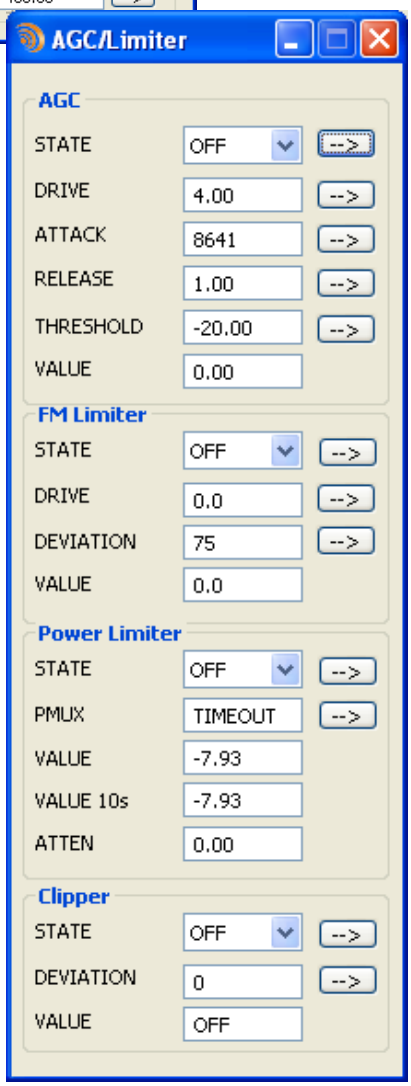
These values are described section 5.4.

Internal Generator:



These values are described section 5.9.

AGC/Limiter:



These values are described section 5.13.

! ***With ECRESO FM version 1.6, AGC parameters and some FM Limiter parameters (State and Drive) are no longer available.***

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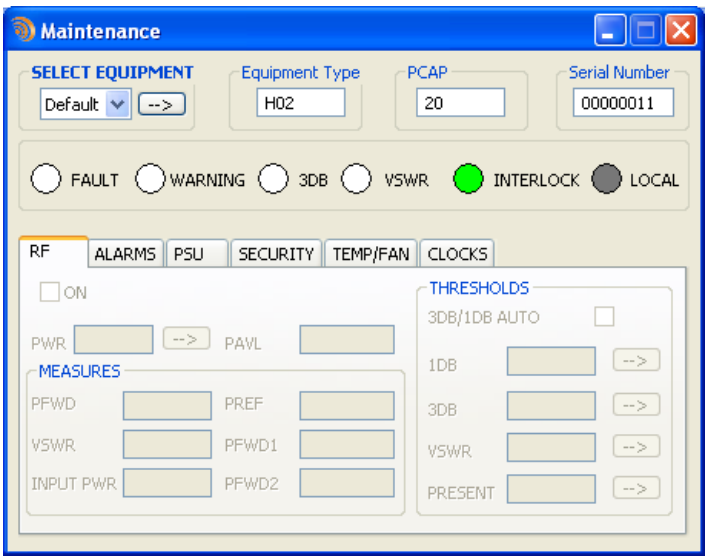
Maintenance:

This window gives access to information specific to each module of a modular transmitter (Ecreso FM + Ecreso FM Amplifier). The menu 'Select equipment' allows the selection of the desired module. In the case of a compact transmitter, the 'default' module is the only choice.

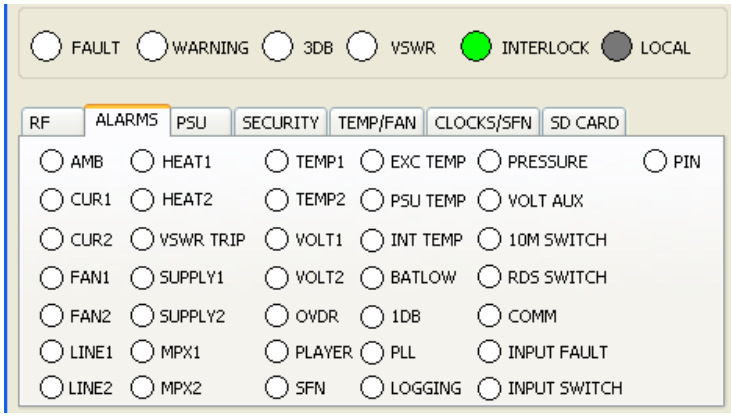
LEDs give the overall status of the module and a set of tabs present maintenance information.



<u>RF tab:</u>

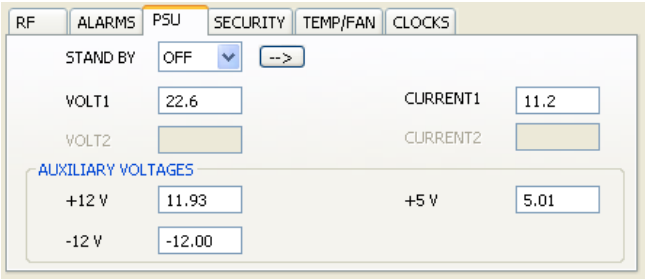
These values are described section 5.3.

They are greyed out for compact transmitters; they can be modified on the main window.

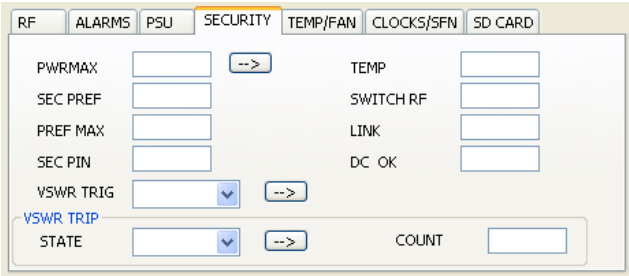


<u>Alarms tab:</u>

Alarms are described in section 7.2.5.



<u>PSU tab:</u>



<u>Security tab:</u>

These values are described section 5.3.

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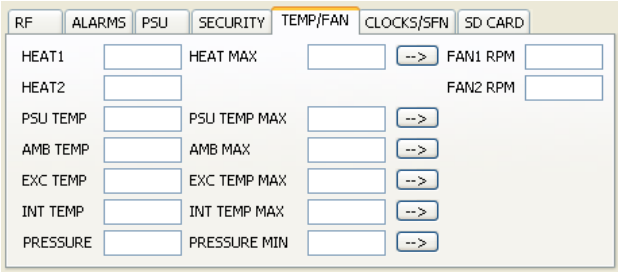
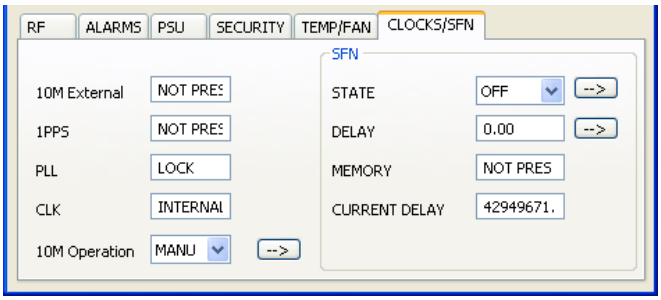
Temp/Fan tab:

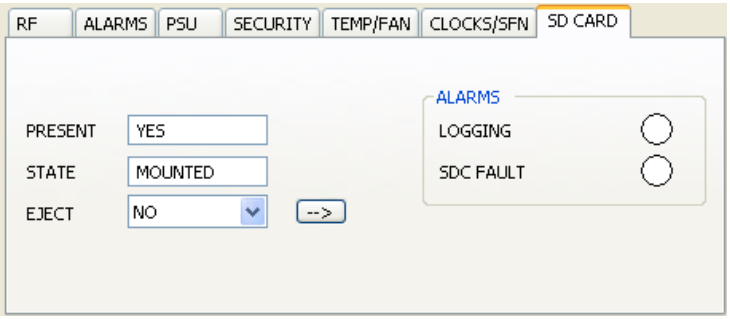


Clocks tab:

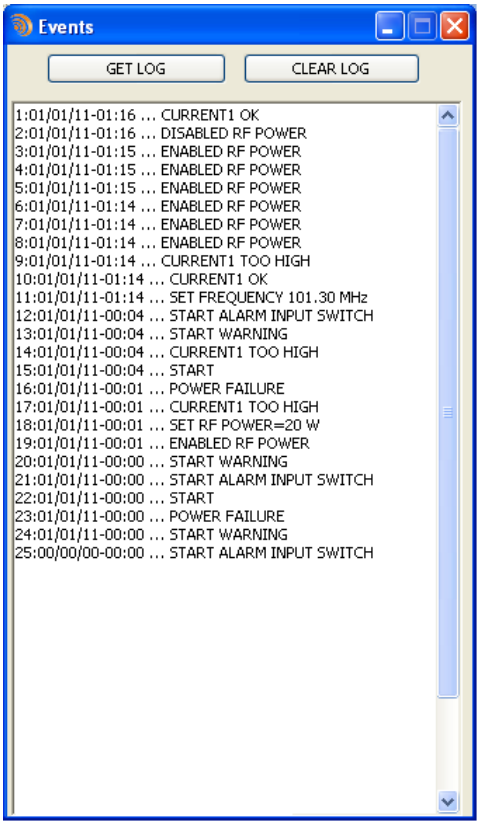


SD Card tab:

These values are described section 5.15.



Events:



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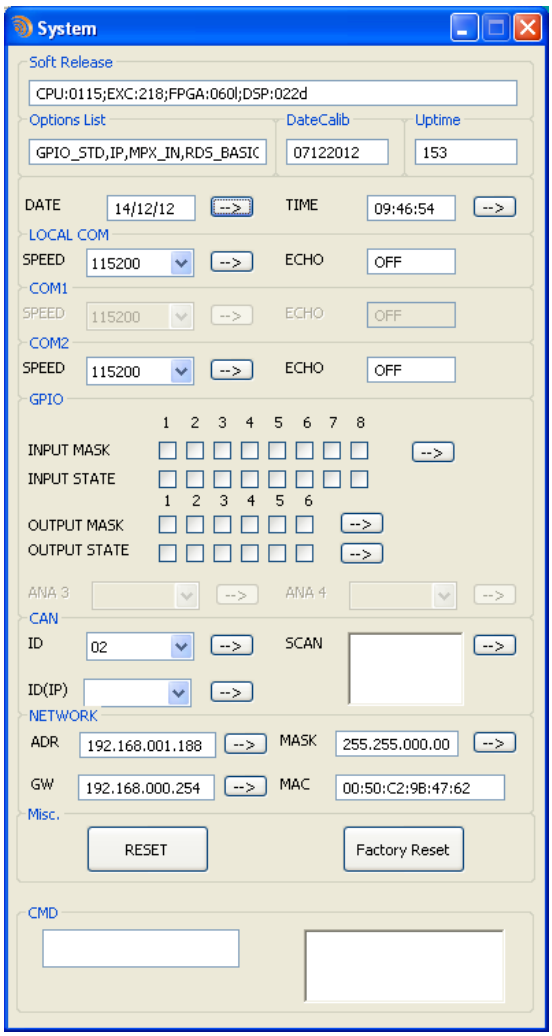
System:



See chapter 11 for a description of GPIOs. Mask and State are equivalent to .MASK and .STATE serial commands described section 11.2.5.

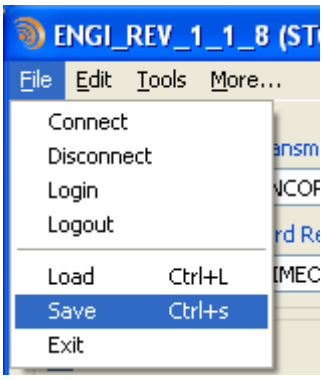
For a list of control and monitoring functions, please see sections 11.2.2 and 11.2.3.

8.2.3. Saving parameters

With the application you may also save parameters, before upgrading or as a backup for instance.

- Select the Files / Save menu.
- Select the location and name for the backup file. Default name is *module_type_serial_number.conf.*

To load a previously saved configuration, use the Files / Load menu.



Loading or saving a configuration file stops real time display of parameters. Simply click the "Start" button on the main window to retrieve them again.

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9. THE EMBEDDED WEBSITE

9.1. Introduction

This function is available when the Communication Pack option is enabled on the transmitter.

! ***This unit does not deal with network related security issues. It is up to the user to set it in a secured environment such as a private network, VPN, behind a firewall…WorldCast Systems cannot be held responsible for the consequences of a security breach on the operating network.***

9.2. Connecting to the embedded web site

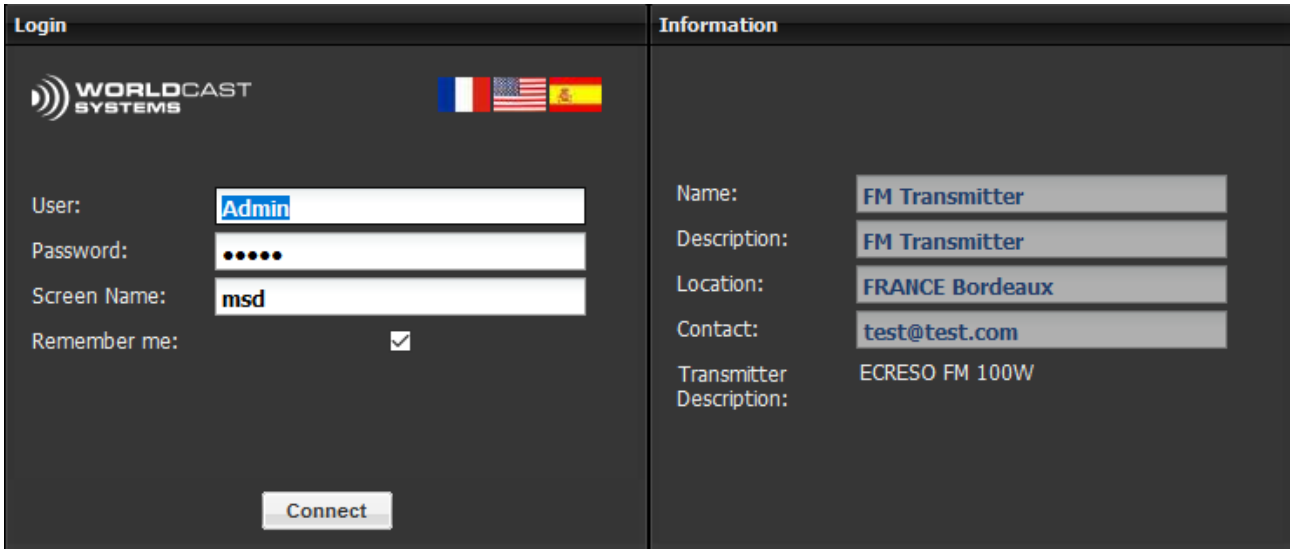
For remote access, connect to the transmitter's embedded web site. Simply open a web browser (Google Chrome, Mozilla Firefox …) and enter the transmitter's IP address in the address bar (set on the front panel).

ⓘ *Though the web application is compatible with most browsers, performances vary from one browser to another. For optimal performances, Google Chrome is recommended.*

ⓘ *The browser may display a message indicating that the connection is not certified; however, the site is secured (data is encrypted) and you may proceed to access it. To prevent these potential blocking and warning messages, WorldCast Systems now supplies certificates for HTTPS browsing, see section 9.6.5 for more information.*

Select the language if necessary.

Enter the user name and password; the screen name is used to chat:



The information in the right frame makes it easier to identify the transmitter before you connect.

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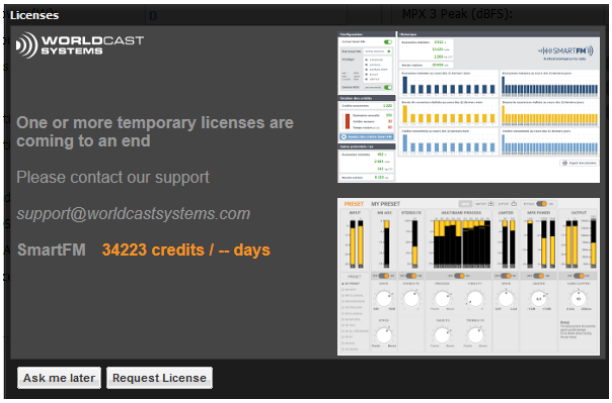
Two user levels are available:

- Administrator (Admin / admin by default). The administrator has full rights,
- Guest (Guest / guest by default). The guest has read-only access to all pages except the user management page.

Check the box to save connection information. This process is managed by the web browser cookies; login and passwords are saved for 15 days.

If several users are connected at once, they all can send commands and change parameters. The last edit will always be taken into account.

After logging, the following display pops up if you have less than 30 days (or equivalent) on a temporary license for the option SmartFM, Sound Processor, RDS or Activation:



Please see section 9.6.3 and appendix A for more information on managing options.

The tool bar on top of the page enables access to all pages of the site: the user can view the **status**, access **receiver** configuration, **RDS** data (if the Basic RDS license is present), **system** configuration and chat.

Data can be both viewed and modified.

A series of indicators on the top of the screen enables all connected users to know the transmitter current status:

Current communication with the transmitter

LOCAL — Transmitter in standard mode

LOCAL — Transmitter in local mode

FAULT — No fault

FAULT — Current fault alarm

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WARNING	No warning
WARNING	Current warning alarm
3DB	No alarm
3DB	Current 3 dB alarm
1DB	No alarm
1DB	Current 1 dB alarm
VSWR	No alarm
VSWR	Current VSWR alarm
INTERLOCK	Interlock not present
INTERLOCK	Interlock present
RF	RF disabled
RF	RF enabled
SmartFM	SmartFM disabled
SmartFM	SmartFM enabled

On the right of this bar, the frequency, the power and the name of the transmitters are also indicated.

The menu on the left allows navigating to the various pages of each section.

A section may include one or more pages; display of hide links to reach them by clicking the buttons + or −.

The tool bar, the indicators and the menu will be available on all pages of the site.

For each page described in the following pages, the path will be indicated with the name of the section in bold and the menu and sub-menu.

Ex: **System**/Network/Network

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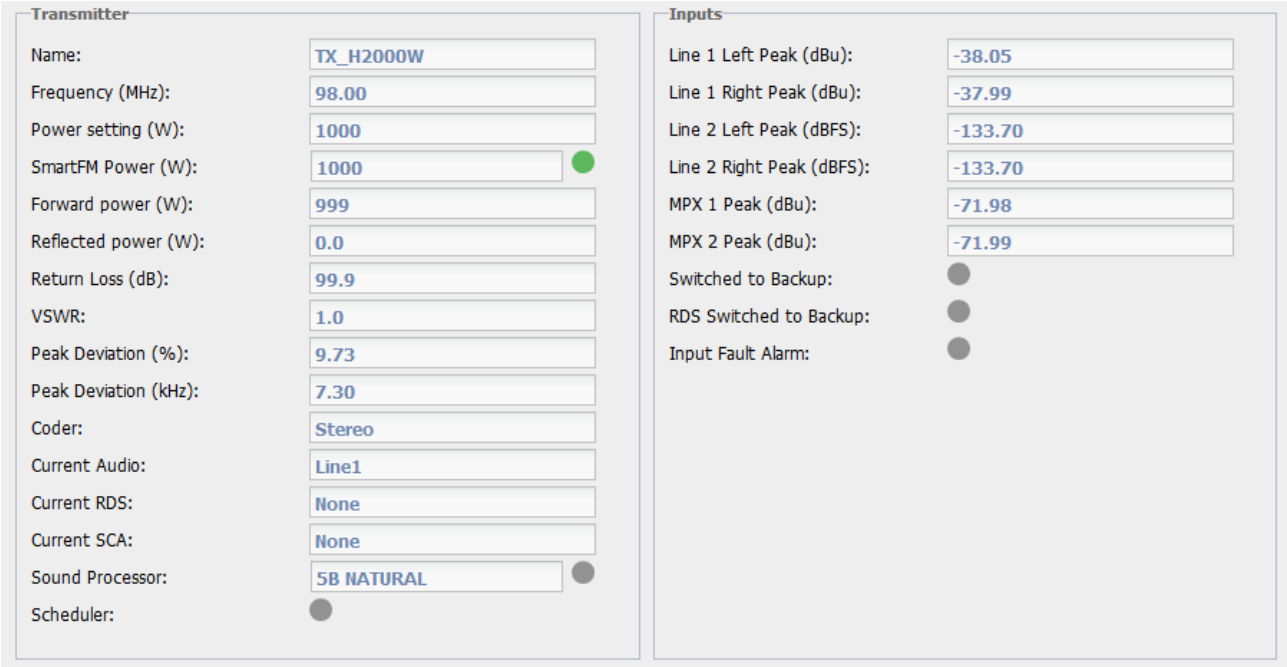
9.3. Viewing the Status

Status pages are first displayed when you connect to the site. Click Status to return to them.

9.3.1. Main status

Path: **Status**/Main/Main

This page displays the main parameters of the transmitter (read-only).



The indicators show:

SmartFM	●	SmartFM enabled
	●	SmartFM off
Sound Processor	●	Sound Processor enabled
	●	Sound Processor off
Scheduler	●	Scheduler enabled
	●	Scheduler off
Switched to Backup	●	Main input is on
	●	Switch to backup input
RDS Switched to Backup	●	Main RDS input is on
	●	RDS switched to backup input
Input Fault Alarm	●	No alarm
	●	Fault type alarm on one of the inputs

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9.3.2. Logbook/History

Recent events

Path: **Status**/Logbook-History/Recent events

View the last 200 events on this page.

Recent events

Clear Log | CSV Export

Sub-System	Start	Severity	Source	Event	Description
Equipment	07/04/2013 07:46:55 GMT	Notice	Alarm	RF Present	ON
Transmitter	07/04/2013 07:46:53 GMT	Info	Configuration	Opmode	ON
Transmitter	07/04/2013 07:46:53 GMT	Notice	Alarm	RF Present	ON [TX.PFWD=50]
Equipment	07/04/2013 07:46:49 GMT	Error	Alarm	RF Present	OFF
Transmitter	07/04/2013 07:46:49 GMT	Info	Configuration	Opmode	OFF
Transmitter	07/04/2013 07:46:49 GMT	Error	Alarm	RF Present	OFF [TX.PFWD=0]
Equipment	07/04/2013 07:46:39 GMT	Info	Configuration	VSWR Threshold set to	1.6
Transmitter	07/04/2013 07:46:37 GMT	Info	Configuration	VSWR Threshold set to	1.6
Equipment	07/04/2013 07:41:24 GMT	Info	Configuration	Audio Deviation set to	63.90
Equipment	07/04/2013 07:41:22 GMT	Info	Configuration	RDS Source set to	INTERNAL
Equipment	07/04/2013 07:41:22 GMT	Info	Configuration	Audio Source set to	LINE2
Equipment	07/04/2013 07:37:25 GMT	Info	Configuration	Coder set to	STEREO
Equipment	07/04/2013 07:37:23 GMT	Info	Configuration	Audio Deviation set to	67.90
Equipment	07/04/2013 07:37:23 GMT	Notice	Alarm	MPX2 Alarm	OFF [CODER.CURRENT.AUDIO=MPX2]
Equipment	07/04/2013 07:37:23 GMT	Notice	Alarm	Fault	OFF
Transmitter	07/04/2013 07:37:21 GMT	Notice	Alarm	Fault	OFF
Equipment	07/04/2013 07:37:17 GMT	Warning	Alarm	MPX2 Alarm	ON [CODER.CURRENT.AUDIO=MPX2]
Equipment	07/04/2013 07:37:17 GMT	Error	Alarm	Fault	ON
Transmitter	07/04/2013 07:37:15 GMT	Error	Alarm	Fault	ON
Equipment	07/04/2013 07:37:07 GMT	Notice	Alarm	MPX2 Alarm	OFF [CODER.CURRENT.AUDIO=MPX2]
Equipment	07/04/2013 07:37:07 GMT	Notice	Alarm	Fault	OFF

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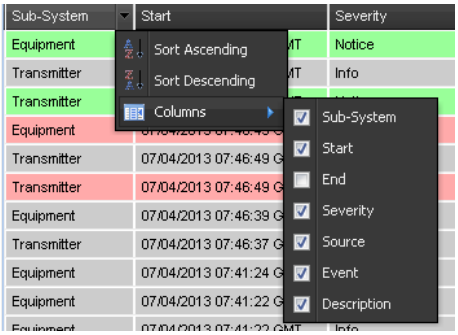
Click on a column title to display a menu that will allow you to sort the column and to display or hide other columns.



The event color gives its degree of severity:

- Red: errors
- Yellow: warning
- Green: notice, end of a warning or error
- Blue: specific notice when the standby mode is enabled
- Grey or White: information

There are several types of events:

- **Configuration changes (source = configuration)**

These events give the parameter that was modified (Event) and the new value for that parameter (Description).

Ex :

Sub-System	Start	Severity	Source	Event	Description
Transmitter	02/05/2015 07:08:21 ART	Info	Configuration	VSWR Threshold set to	1.5

The transmitter configuration has been changed, the VSWR threshold is now set to 1.5.

For a list of configuration changes that may appear in the event log, please see the Configuration commands (section 7.2.4) for “Equipment” events (Sub-System column) and to transmitter commands (section 7.2.3) for “Transmitter” events.

- **Alarms**

These events give the beginning and end of Warning and Fault (Error) type alarms.

In the Description column, we see both the status of the alarm and the last variables related to that event. .

Ex:

Sub-System	Start	Severity	Source	Event	Description
Equipment	02/05/2015 11:33:01 ART	Notice	Alarm	3dB Alarm	OFF [MEAS.PFWD=20]
Transmitter	02/05/2015 11:30:12 ART	Error	Alarm	3dB Alarm	ON [TX.PFWD=20]
Equipment	02/05/2015 11:30:07 GMT	Warning	Alarm	MPX2 Alarm	ON [CODER.CURRENT.AUDIO=MPX2]

1st event: the 3 dB alarm on the exciter is over, the last forward power reading was 20 W.

2nd event: beginning of the 3 dB alarm on the transmitter, the last forward power reading was 20 W.

3rd event: beginning of the MPX2 alarm on the exciter, the channel last used by the exciter was the MPX2 channel.

For a list of alarms that may appear in the event log, please see the Alarm commands (section 7.2.5).

- **General information**

Ex:

Sub-System	Start	Severity	Source	Event	Description
General	02/05/2015 07:08:21 ART	Notice	System	Standby	OFF
System	02/05/2015 07:07:48 ART	Info	None	System Software Start	down time (HH:MM:SS): 00:02:23

“System Software Start” give the time the system was started.

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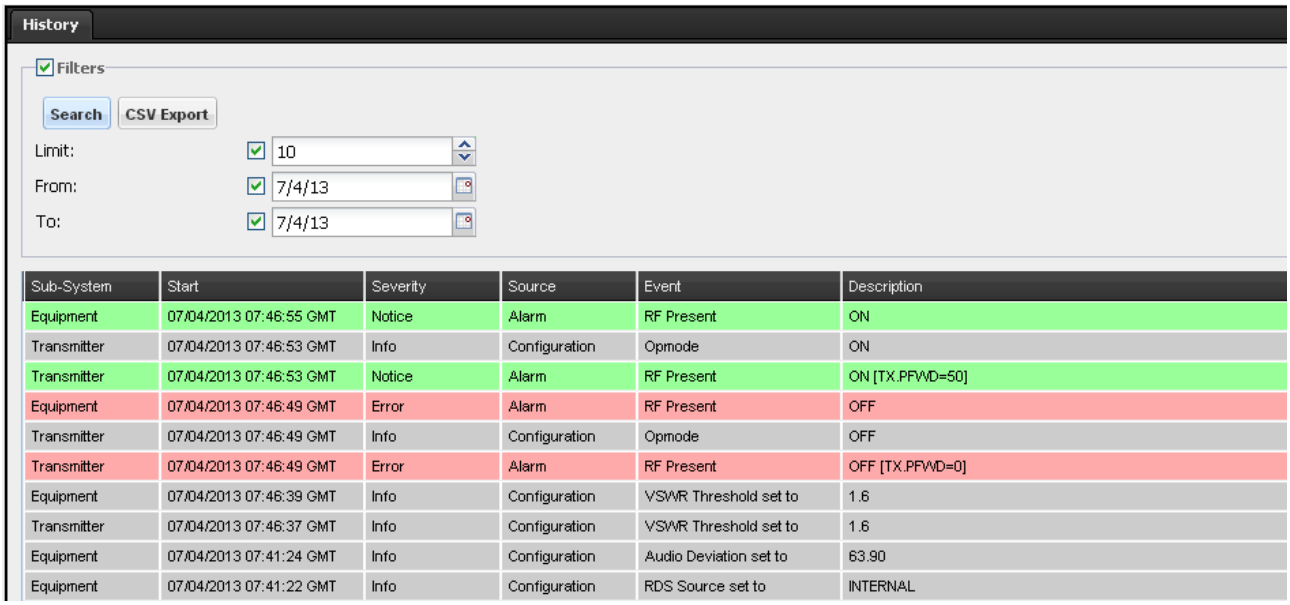
You may clear the log using the “Clear Log” button.

You may also export the log: clicking the “CSV export” button will create the file log_rt.csv in you download directory.

Log History

Path: **Status**/Logbook-History/Log History

With this page, filter events according to dates and display a set number of results. A maximum of 1000 events are kept.



Sub-System	Start	Severity	Source	Event	Description
Equipment	07/04/2013 07:46:55 GMT	Notice	Alarm	RF Present	ON
Transmitter	07/04/2013 07:46:53 GMT	Info	Configuration	Opmode	ON
Transmitter	07/04/2013 07:46:53 GMT	Notice	Alarm	RF Present	ON [TX.PFWD=50]
Equipment	07/04/2013 07:46:49 GMT	Error	Alarm	RF Present	OFF
Transmitter	07/04/2013 07:46:49 GMT	Info	Configuration	Opmode	OFF
Transmitter	07/04/2013 07:46:49 GMT	Error	Alarm	RF Present	OFF [TX.PFWD=0]
Equipment	07/04/2013 07:46:39 GMT	Info	Configuration	VSWR Threshold set to	1.6
Transmitter	07/04/2013 07:46:37 GMT	Info	Configuration	VSWR Threshold set to	1.6
Equipment	07/04/2013 07:41:24 GMT	Info	Configuration	Audio Deviation set to	63.90
Equipment	07/04/2013 07:41:22 GMT	Info	Configuration	RDS Source set to	INTERNAL

Results can be sorted and exported as with recent events.

Event types are identical to those described in the previous section.

The name of the filtered export log is log_filter.csv.

24 hour history

Path: **Status**/Logbook-History/24h History

This page displays measurements over the last day (default view) or the last hour:

- Average forward power
- Forward power and set power[1]
- Forward power[1]
- VSWR[1]
- Voltage
- Current
- Global efficiency
- Mosfet efficiency
- Ambient temperature
- Fan speed[2]
- Power supply temperature
- Main control board temperature
- Atmospheric pressure
- Digital modulator temperature
- Preamplifier power[2]

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- Heatsink temperature[2]
- Electricity savings[3]
- Estimated consumption[3]

[1] *For modular transmitters, these readings are available both for the exciter and for the whole transmitter*

[2] *Available measurements vary depending on the power of the transmitter*

[3] *Readings available with the SmartFM option*

To display a specific day or time, slide the abscissa's label.

A button allows clearing the history.

Please note that these are Ecreso FM only readings: for modular transmitters, they do not include measurements of the ECRESO FM Amplifier(s).

9.3.3. Advanced measurements

Overview

Path: **Status**/Advanced Measurements/Overview

Four graphs are available on this page:

- RF spectrum
- MPX output
- Current input spectrum
- Audio level

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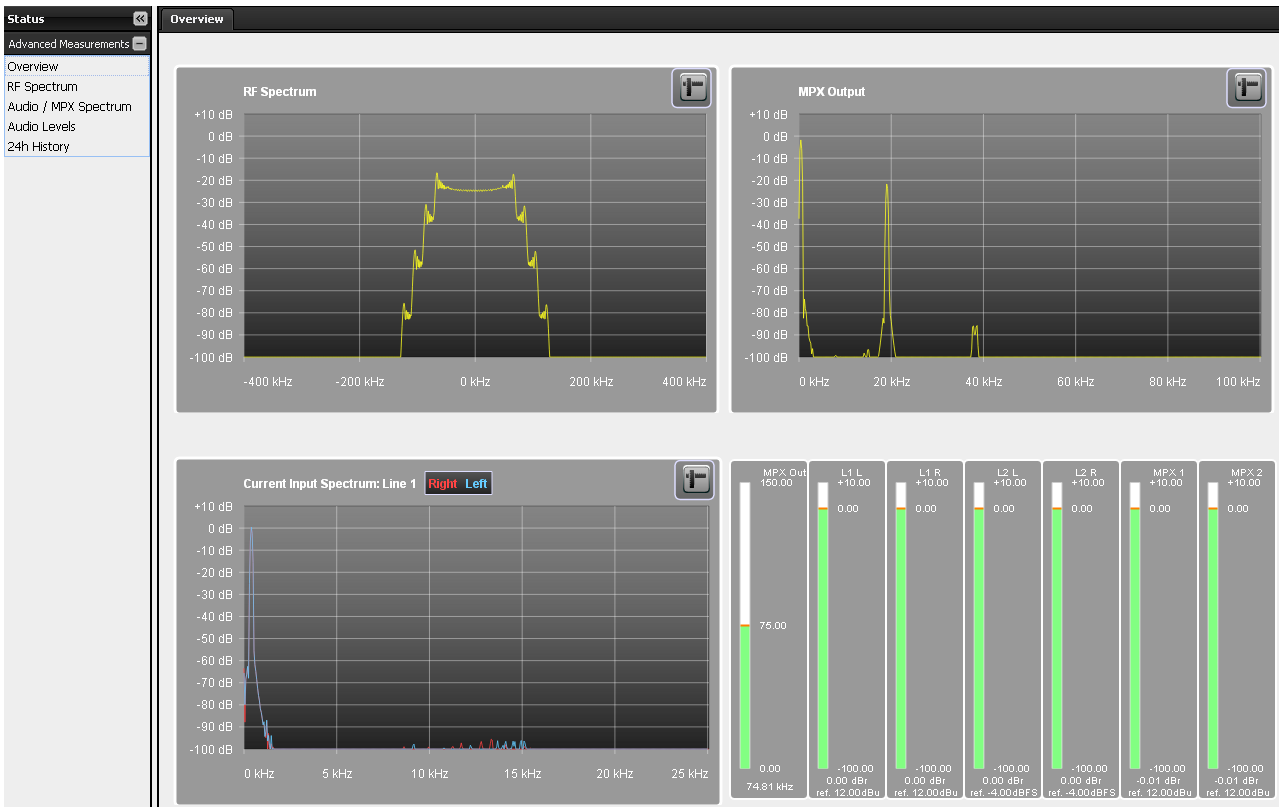

On each curve, the button displays the abscissa and ordinate of a specific point. Click and drag the abscissa's label to view other points on the curve.

Curves are displayed in dBr; the reference takes into account the drive and the trim.

For instance, if the actual input level is 12 dBu and the set input level is 12 dBu, the drive is set to -1 dB and the trim is set to -0.1 dB, the left level will be displayed at +1 dBr and the right at +1.1 dBr.

The **RF Spectrum** page displays the same curve as on the overview page but on a larger scale.

Path: **Status**/Advanced Measurements/RF Spectrum

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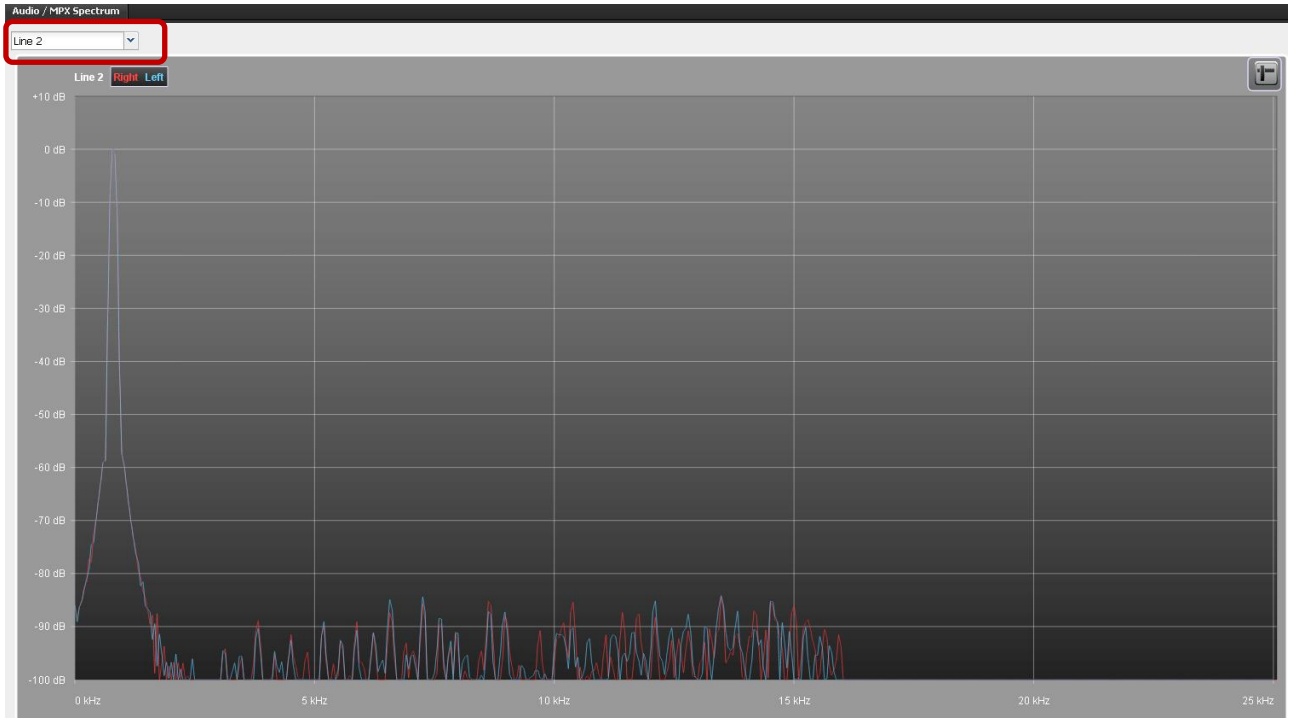
The **Audio/MPX Spectrum** page displays either of the selected curves:

Path: **Status**/Advanced Measurements/Audio / MPX Spectrum

- Line 1
- Line 2
- MPX inputs
- Audio backup
- MPX output



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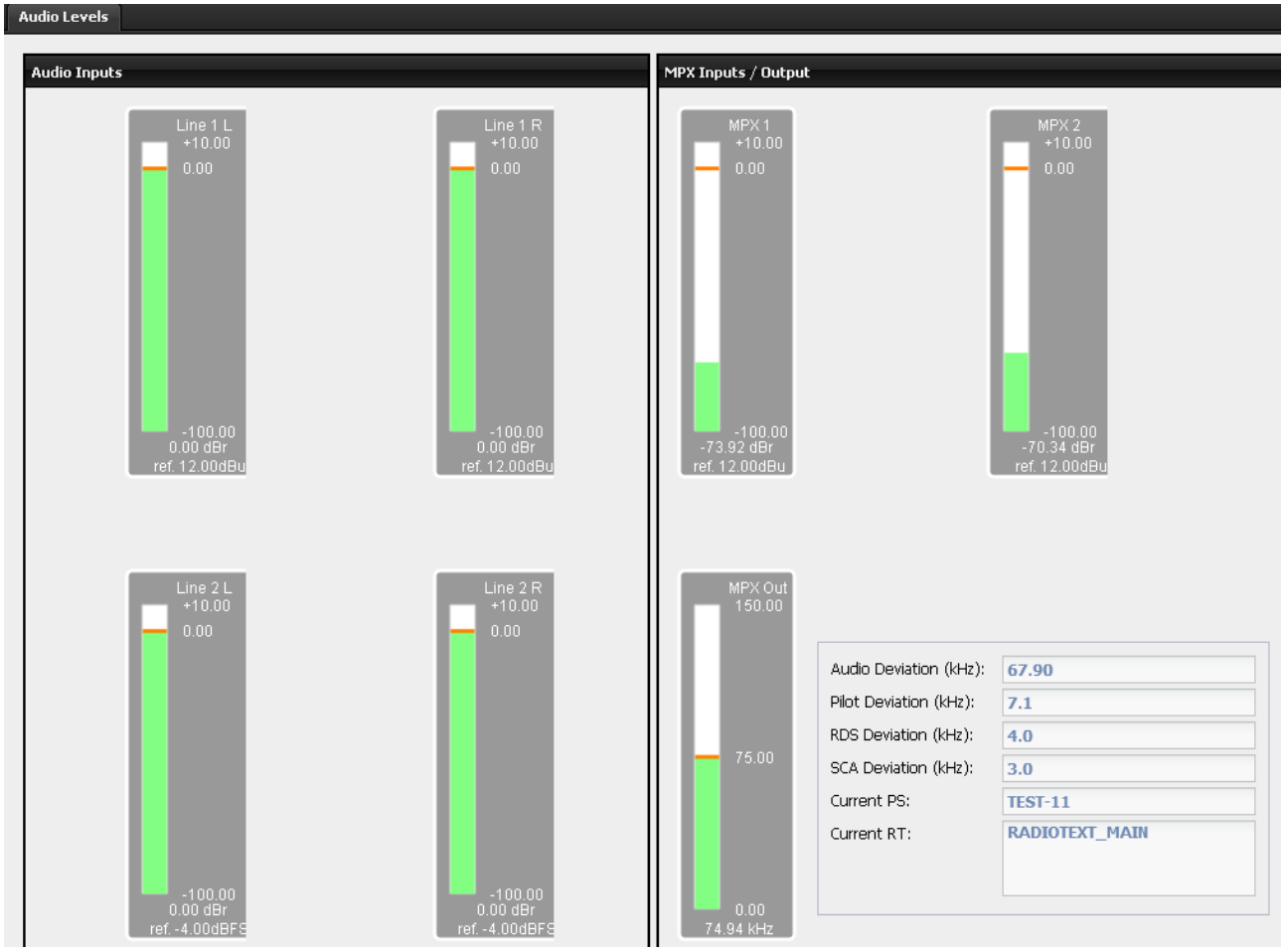
The **Audio levels** page displays the same curve as on the overview page but on a larger scale.

Path: **Status**/Advanced Measurements/Audio Levels



Red lines the reference level. On the MPX outputs graph, the reference level is the total deviation, which can be set in the transmitter configuration pages. If the total deviation is changed, the audio levels page has to be refreshed to display the new value.

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9.4. Transmitter configuration

Click the button Transmitter to access transmitter configuration pages.

This section displays the parameters of the transmitter so they can be updated.

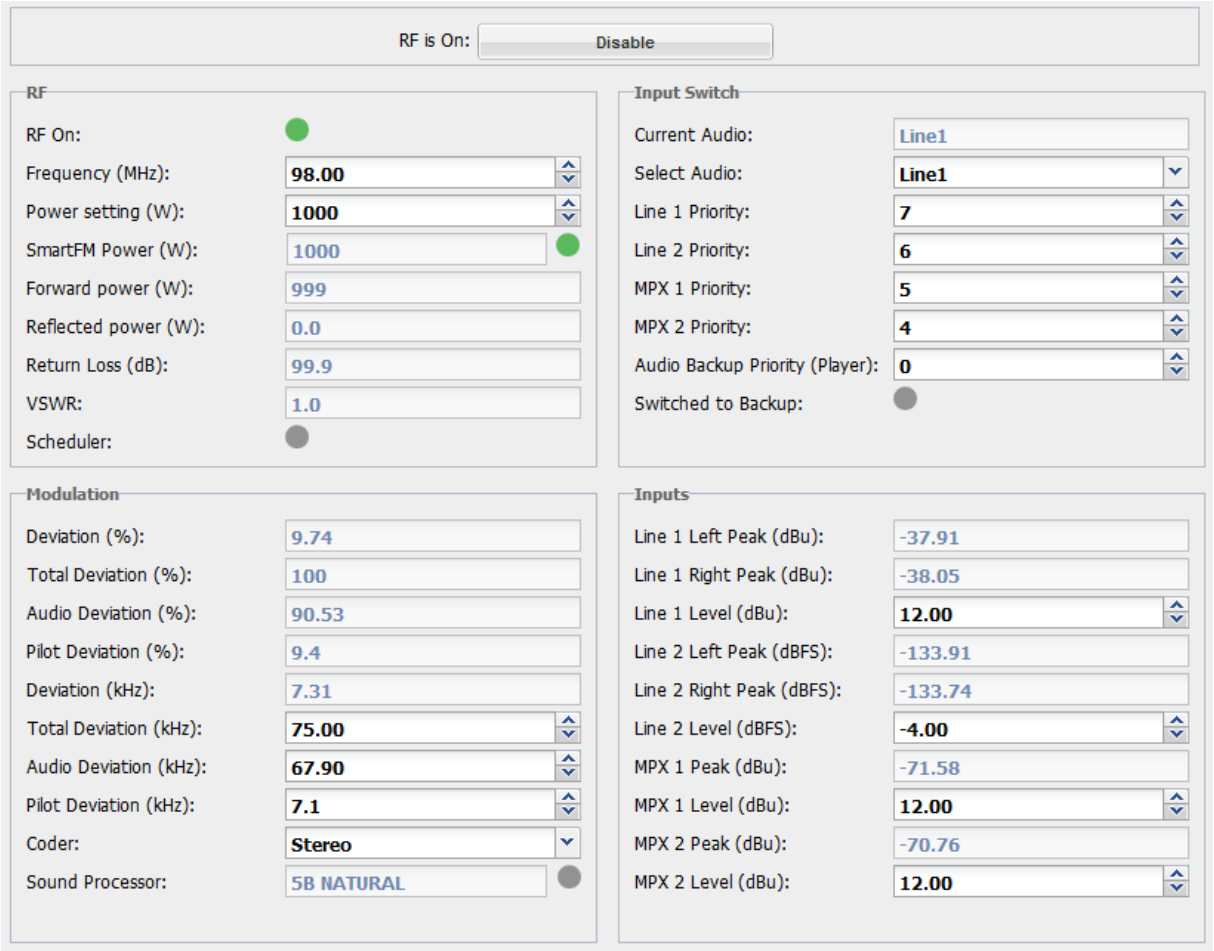
When values have been changed, the button Save becomes visible, click on it to save the new settings.

If the transmitter is in local mode (orange indicator at the top of the page), you will not be able to modify settings.

9.4.1. Easy configuration

Path: **Transmitter**/Easy Config/Easy Config

All basic parameters are available on this page. They are available on the front panel in the Easy mode. Please refer to parameter descriptions sections 5.4 to 5.12 for more details.



With the button on top of the page, enable/disable the RF

Indicators show:

RF on	●	RF enabled
	●	RF off
SmartFM	●	SmartFM enabled
	●	SmartFM off

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Scheduler	●	Scheduler enabled
	●	Scheduler off
Sound Processor	●	Sound Processor enabled
	●	Sound Processor off
Switched to Backup	●	Main input is on
	●	Switch to backup input

For a complete configuration, use the Main, Modulation, Input Select and Input Sources pages.

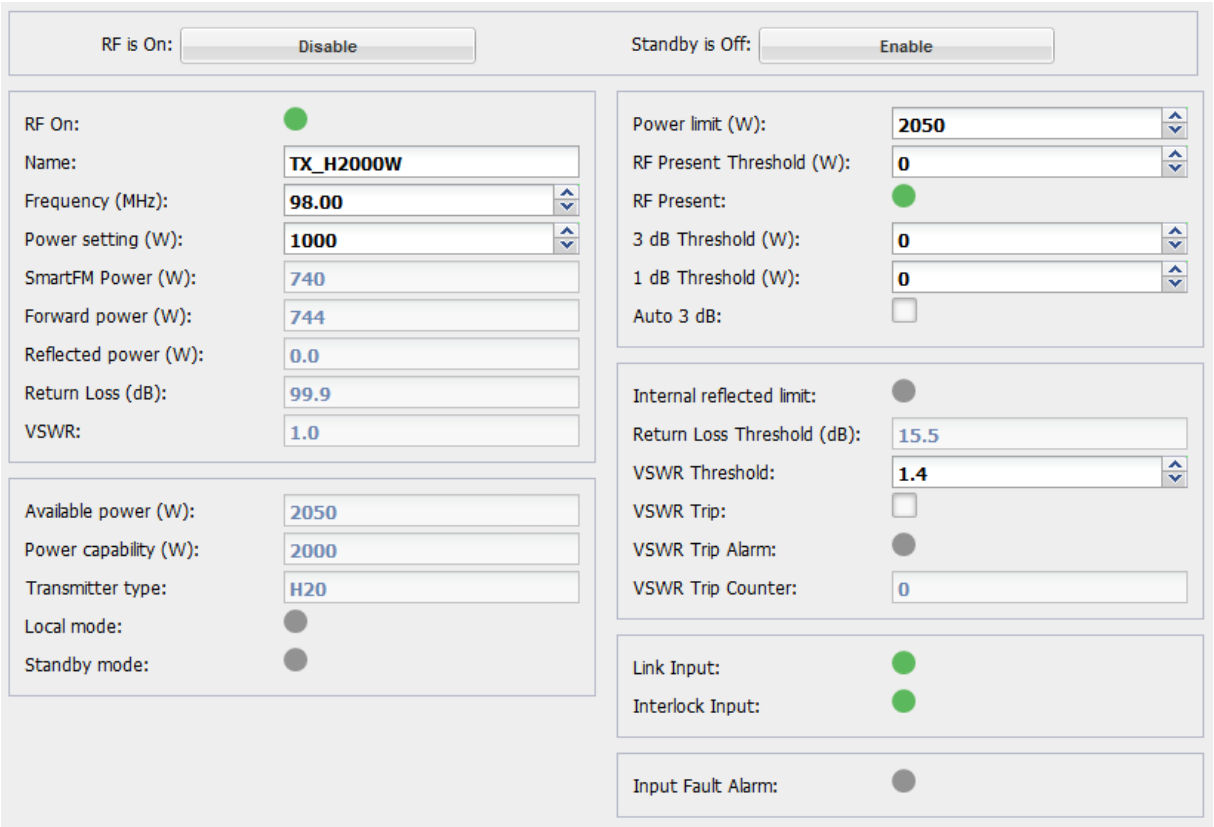
ⓘ *If Line 2 is set as a digital MPX input (see section 9.6.2), Line 1 parameters are replaced with MPX 3 and MPX 4 parameters, similar to MPX 1 and MPX 2 parameters.*

9.4.2. Main configuration

Parameters

Path: **Transmitter**/Main/Parameters

Set RF parameters on this page. Please refer to parameter descriptions section 5.4 for more details.



Indicators show:

RF On	●	RF disabled
	●	RF enabled

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Local mode	●	Transmitter in standard mode
	●	Transmitter in local mode
Standby mode	●	Standby mode is disabled
	●	Standby mode is enabled
RF Present	●	RF not detected
	●	RF detected
VSWR Trip alarm	●	No alarm
	●	Current VSWR trip alarm
Link input	●	Link disabled
	●	Active link
Interlock input	●	Interlock not present
	●	Interlock present
Input fault alarm	●	No alarm
	●	Fault type alarm on one of the inputs

SmartFM

Path: **Transmitter**/Main/SmartFM

On this page set SmartFM and analyze its results.

Please refer to parameter descriptions section 5.5 for more details.

ⓘ *SmartFM is an option. If the license is not present, the function cannot be enabled.*

Graphs display actual savings and boost, as well as used credits over the past 12 previous months and 31 previous days. They make it possible to visualize how spent credits are used: as savings or as boost.

With the 'Export Data' button, retrieve the data from the 6 graphics, but also CO_2 and money savings over the past 12 months and the past 31 days in a csv file.

ⓘ *Values presented on this page (year estimation, remaining days, potential benefits/year) may be erroneous during the initialization phase. A 30 day operating period is required for optimal estimations.*

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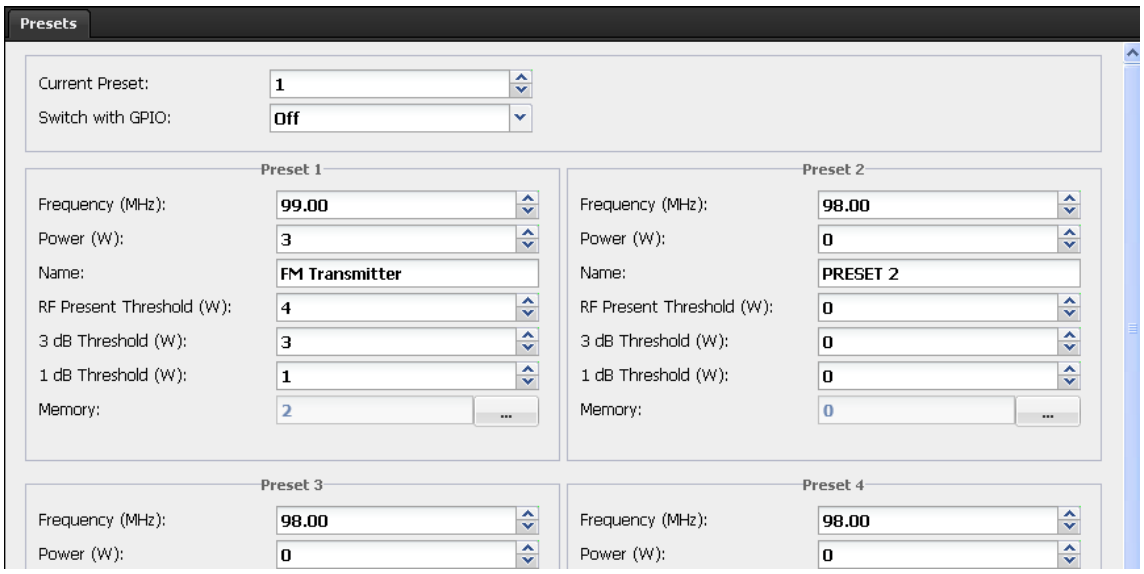
Presets

Path: **Transmitter**/Main/Presets

Manage up to 8 presets on this page.



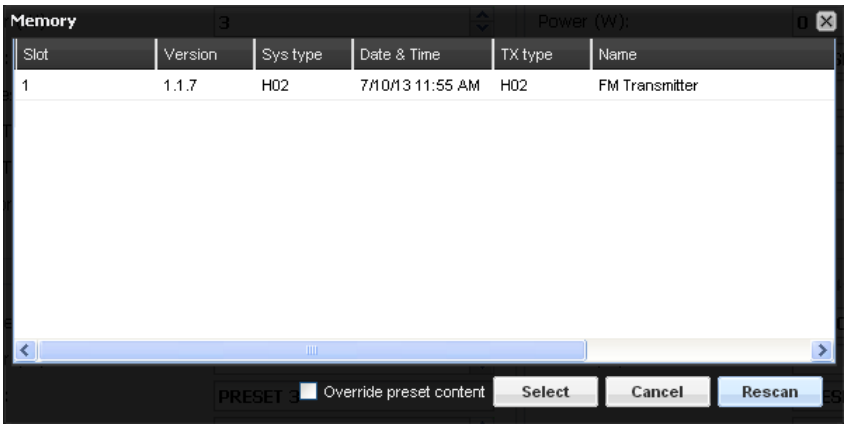
Eight presets are available. For each, manually set the name, frequency, power and 1 dB and 3 dB alarm thresholds or link each preset to a memory saved on the µSD card.

When using memories, the whole transmitter configuration is associated to the preset: RF, input and RDS configuration.

To link a preset to a memory, click the button, click “Rescan” to display the content of the card and select the slot of the memory.

You may override the present content visible and editable on screen.

To save a memory on the µSD card, see section 9.7.3.



On the top of this page, set the current preset and whether it can be switched with GPIOs (optional standard GPIO board).

To manage presets 1 to 4 with GPIOs, select ‘4 inputs:

Preset	Remote Control	Input name	Common
1	RC5	CONF3(22)	RC_COMMUN(24)
2	RC6	CONF4(10)	RC_COMMUN(24)
3	RC7	CONF5(23)	RC_COMMUN(24)
4	RC8	CONF6(11)	RC_COMMUN(24)

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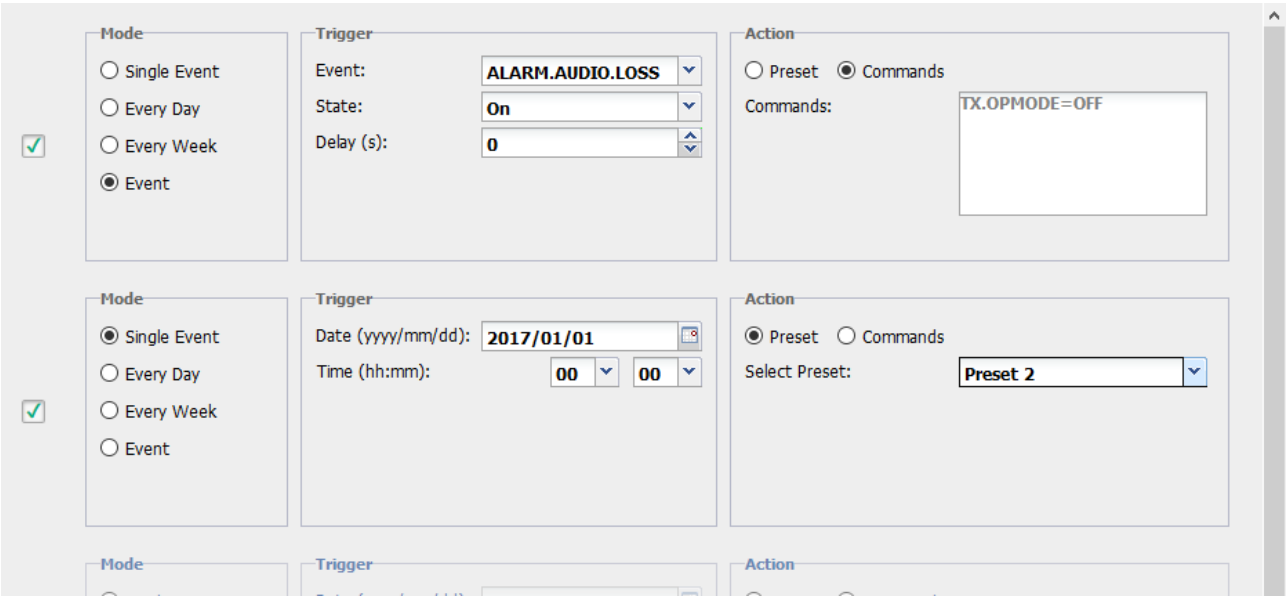
To manage presets 1 to 8 with GPIOs, select '8 inputs':

Preset	Remote Control	Input name	Common
1	RC1	OPT1A(20)	RC_COMMUN(24)
2	RC2	OPT2A(8)	RC_COMMUN(24)
3	RC3	CONF1(21)	RC_COMMUN(24)
4	RC4	CONF2(9)	RC_COMMUN(24)
5	RC5	CONF3(22)	RC_COMMUN(24)
6	RC6	CONF4(10)	RC_COMMUN(24)
7	RC7	CONF5(23)	RC_COMMUN(24)
8	RC8	CONF6(11)	RC_COMMUN(24)

For more details on GPIOs' working principle and pinout, see chapter 11.

Scheduler

Path: **Transmitter**/Main/Scheduler



With the scheduler, the transmitter settings can be modified a single time, regularly (every day or every week) or when triggered by an event.

Enable an instance of the scheduler and set the time and date.

A daily occurrence will take place every day at the set time, starting at the set date. A weekly occurrence will take place on the week day of the selected date, starting at the set date.

For an event triggered action, select the alarm which will generate the action.

ⓘ *Up to 10 seconds may be necessary between the time the event is triggered and the time of the action.*

To set which parameters should be modified, select a preset or a series of commands.

Presets are set on the Transmitter/Main/Preset page.

Select Commands to enter a maximum of 10 serial commands (see chapter 7). Each command including the last one must be followed by a carriage return (Enter key).

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You can for instance enable transmitter presets or change the transmitter's power every day at the same time, or change a sound process preset for a weekly show.

Ex:

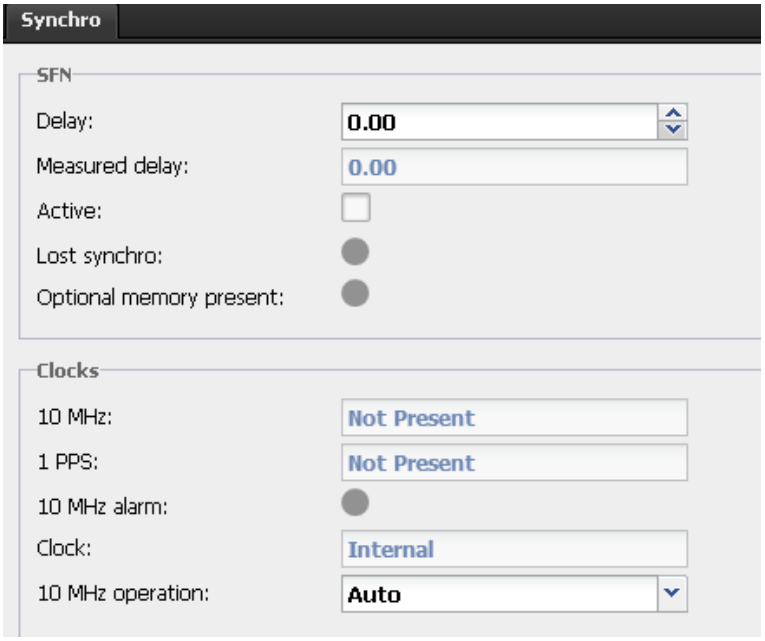
To lower the transmitter power every night from 1000 W to 750 W, enable two events in the scheduler:

- The 1st event at 6:00 am every day launches the command TX.PWR = 1000
- The 2nd event at 23:00 pm every day launches the command TX.PWR = 750

Synchro

Path: **Transmitter**/Main/Synchro

This page is only available with SFN and 10 MHz input options when the SFN license is enabled on the transmitter. For the 10 MHz input option, the optional memory is not present, so the SFN should not be activated and the delay should not be set.



On this page, set synchronization parameters, including SFN parameters. Please refer to parameter descriptions section 5.4 for more details

Three indicators show:

Lost synchro	●	No SFN alarm
	●	Current SFN alarm due to a loss of the external 10 MHz or of the external 1 PPS or due to a difference between the set SFN delay and the measured SFN delay. This alarm indicates a loss of SFN, not a loss of transmission.
Optional memory present	●	Memory required for SFN not present
	●	Memory required for SFN present
10 MHz alarm	●	No alarm
	●	Current 10 MHz alarm due to a 10 MHz switch

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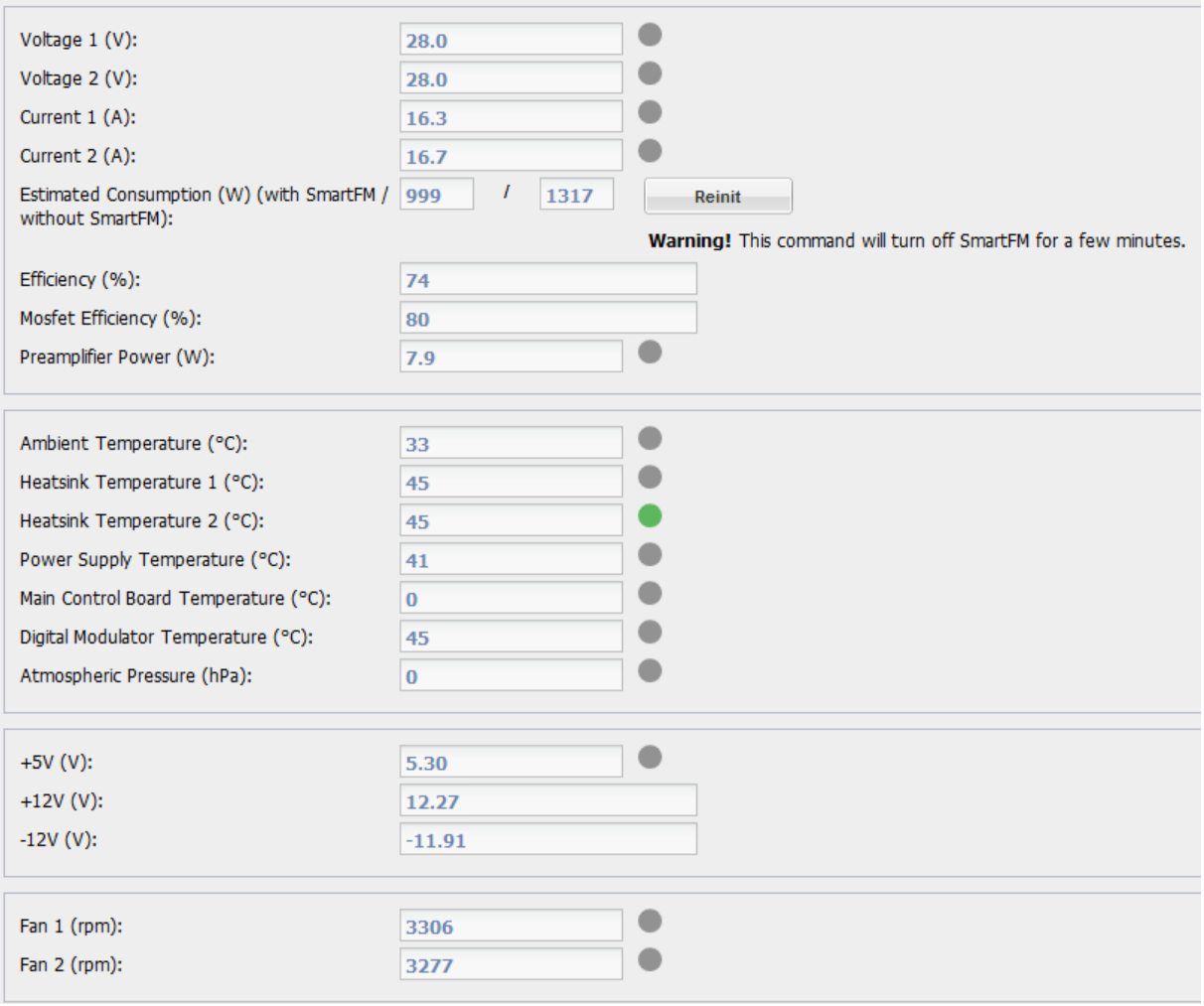
Monitoring

Path: **Transmitter**/Main/Monitoring

On this page, view the physical state of the transmitter.



Each indicator can be either grey ● if the state is normal or yellow ● if there is an alarm on the given parameter.

Note that if too high, the **heatsink temperature** can trigger two different alarms:

- ● Warning type alarm. The temperature is higher than the user set threshold (CONF.INT_TEMP.MAX)
- ● Default, the RF is shut off. The temperature is higher than the factory set limit (70° for modules 1000 W or less, 80° for 1500 W modules, 90° for 2000 W modules).

ⓘ *Efficiency values are only accurate when the power is stable. When SmartFM is enabled, the power is constantly adjusted, displayed efficiency readings are therefore not significant.*

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9.4.3. Modulation configuration

Deviation

Path: **Transmitter**/Modulation/Deviation

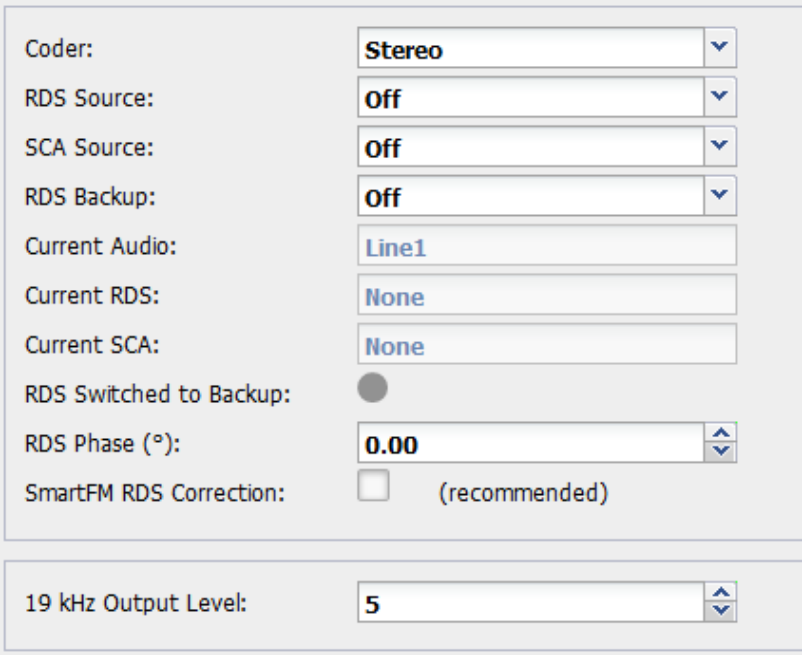
Set the deviation on this page. Please refer to parameter descriptions section 5.12 for more details.

The % equivalent to values set in kHz is displayed.

Settings

Path: **Transmitter**/Modulation/Settings

Set the RDS and SCA sub-carriers on this page. Please refer to parameter descriptions section 5.14 for more details.



The "RDS Switched to Backup" indicator shows:

- Main RDS input is on
- RDS switched to backup input

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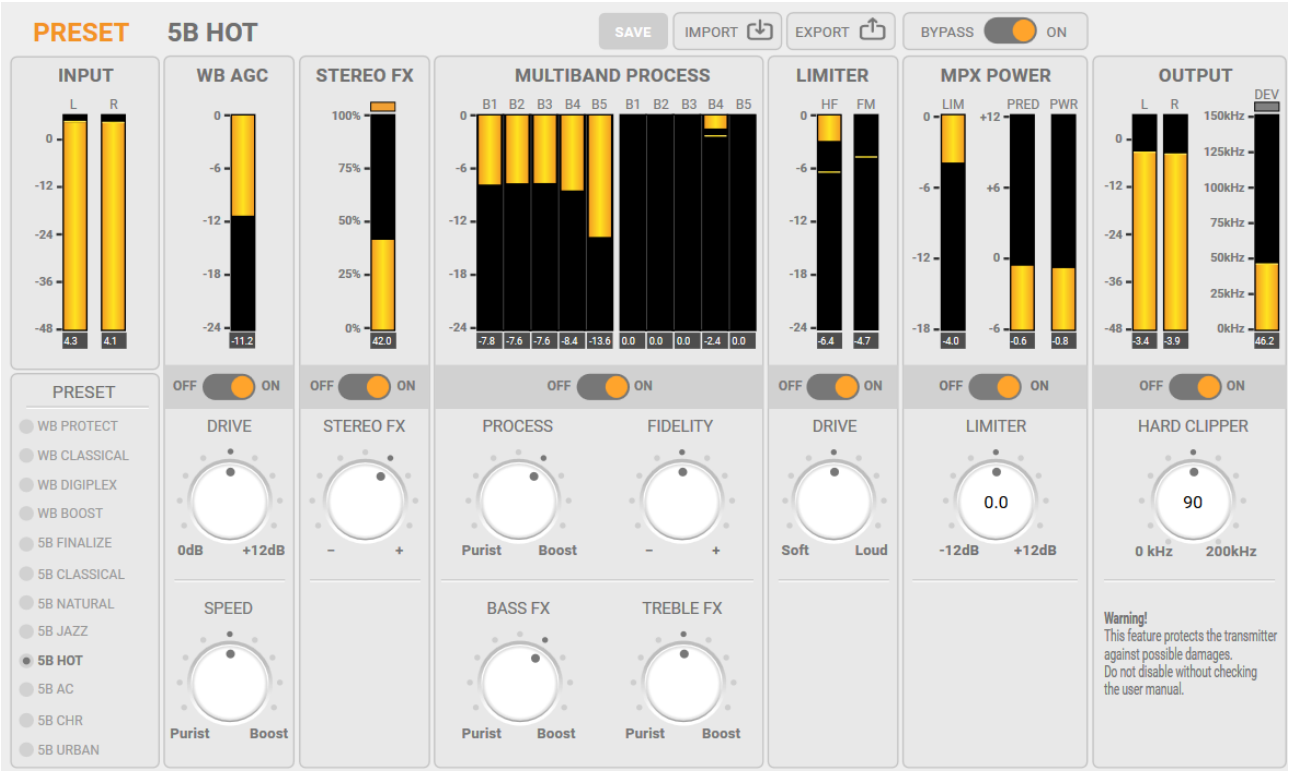
Sound Processor

Path: **Transmitter**/Modulation/Sound Processor



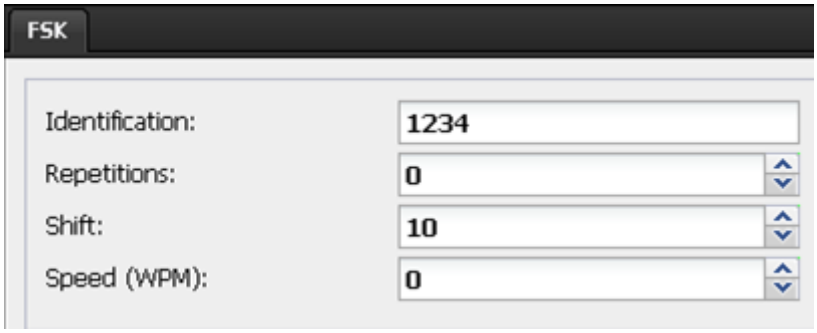
Modifications on this page are applied in real time. However, you must use the Save button to store them permanently.

See chapter 10 for more details on the sound processor.

FSK

Path: **Transmitter**/Modulation/FSK

Set the FSK on this page. Please refer to parameter descriptions section 5.12 for more details.



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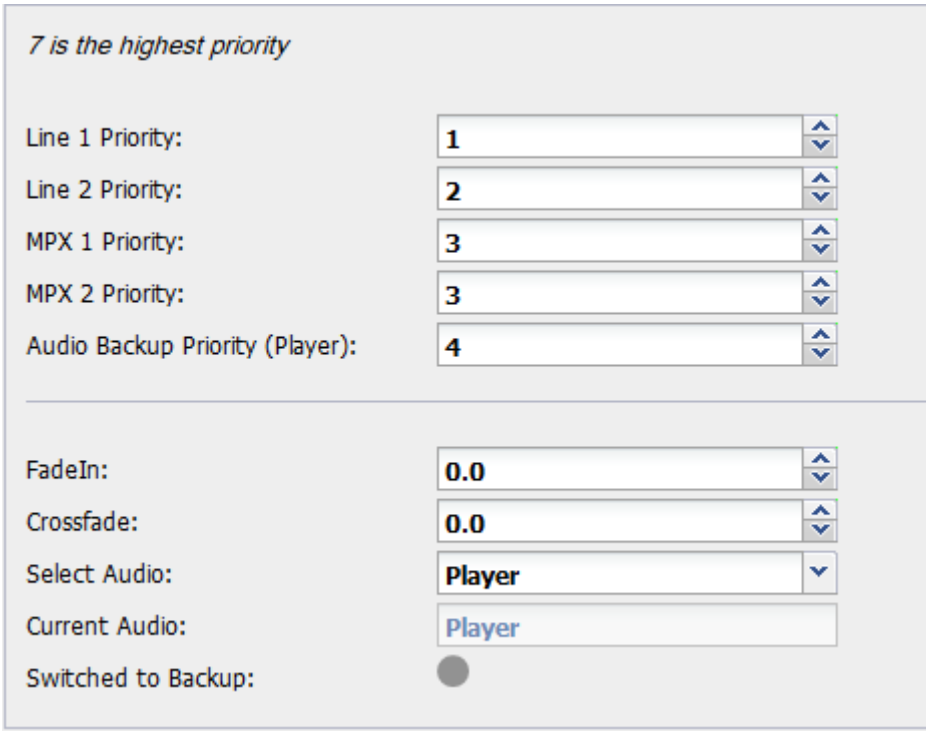
9.4.4. Input Selection

Auto Switch

Path: **Transmitter**/Input Select/Auto Switch

Set the priority of the various inputs on this page. Please refer to parameter descriptions sections 5.3 and 5.6 for more details.



The "Switched to Backup" indicator shows:

- Main input is on
- Switch to backup input

If Line 2 is set as a digital MPX input (see section 9.6.2), Line 1 parameters are replaced with MPX 3 and MPX 4 parameters, similar to MPX 1 and MPX 2 parameters.

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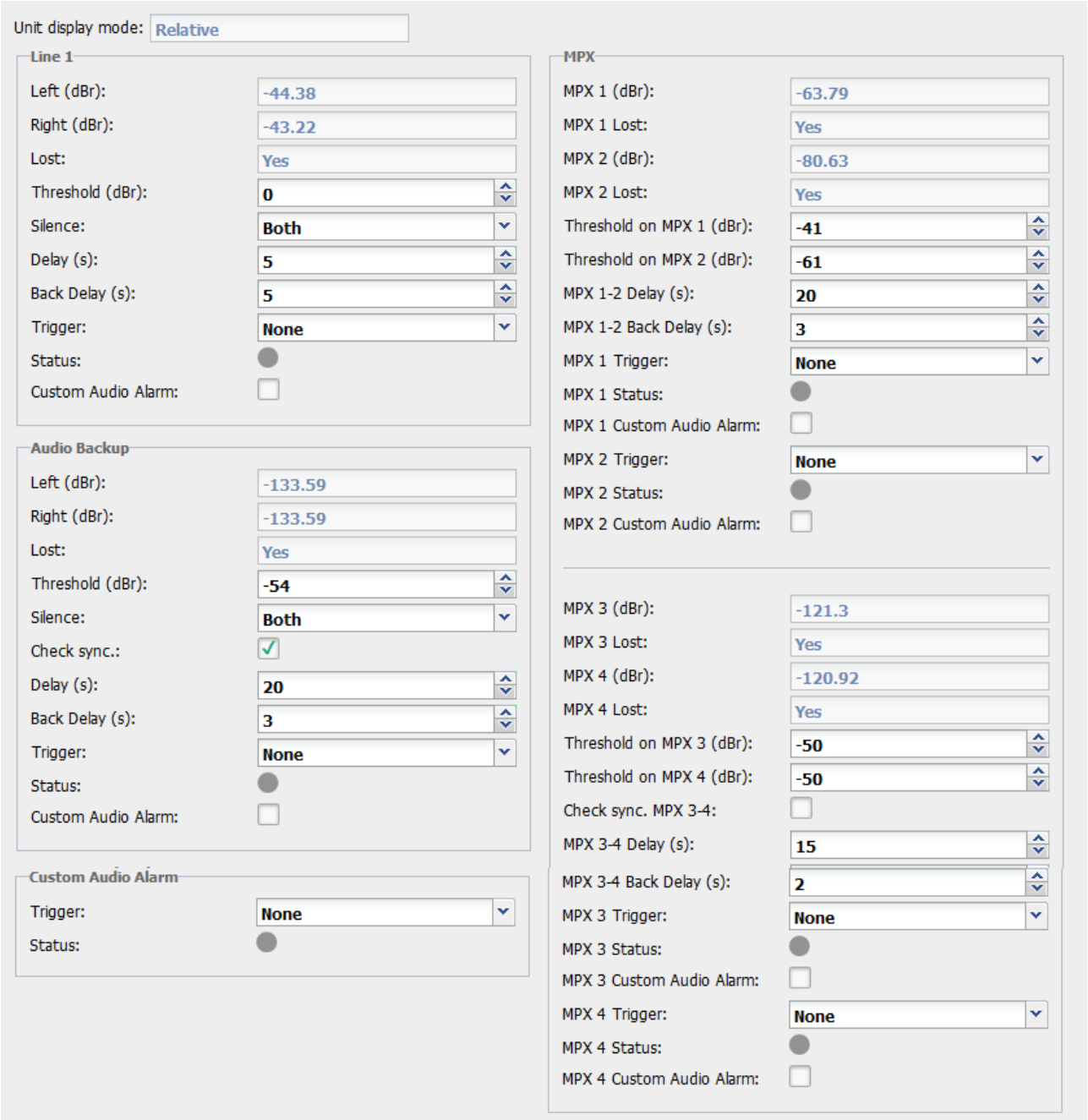
Silence Detector

Path: **Transmitter**/Input Select/Silence Detector

Set silence detector parameters for various inputs on this page. Please refer to parameter descriptions sections 5.3 and 5.6 for more details.



Loss of signal can be set either as warning or as fault. Depending on the configuration, this loss of signal will trigger a warning or a fault on the main status bar, and the “Status” indicators on this page will either turn yellow (warning) or red (fault).

If Line 2 is set as a digital MPX input (see section 9.6.2), Line 1 parameters are replaced with MPX 3 and MPX 4 parameters, similar to MPX 1 and MPX 2 parameters.

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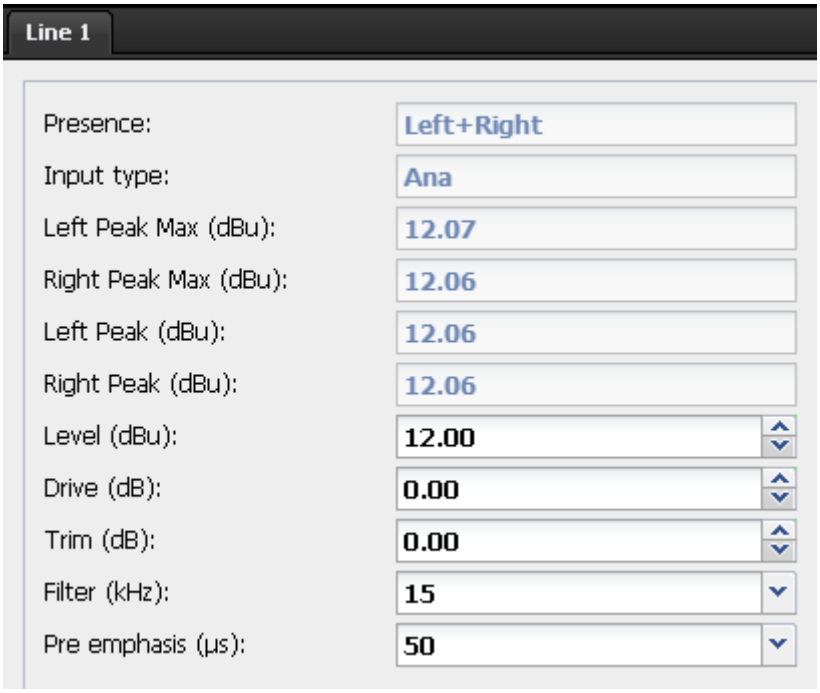
9.4.5. Input Sources

Line 1 / Line 2

Path: **Transmitter**/Input Source/Line 1 (or Line 2)

Set the analog input (Line 1) or the AES input (Line 2) on these pages. Please refer to parameter descriptions sections 5.7 and 5.8 for more details.



AES levels are in dBFS.

If Line 2 is set as a digital MPX input (see section 9.6.2), Line 1 parameters are replaced with MPX 3 and MPX 4 parameters, similar to MPX 1 and MPX 2 parameters.

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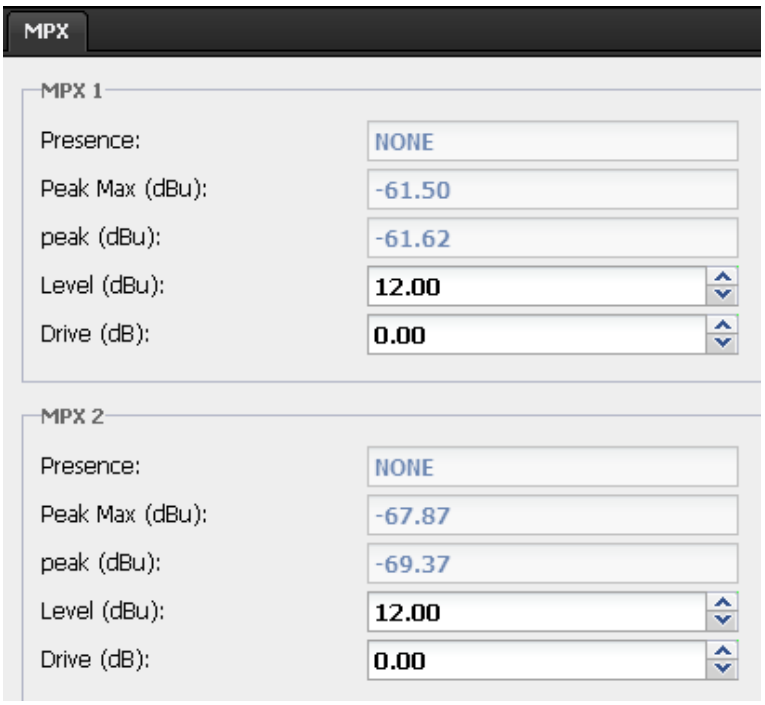
MPX

Path: **Transmitter**/Input Source/MPX

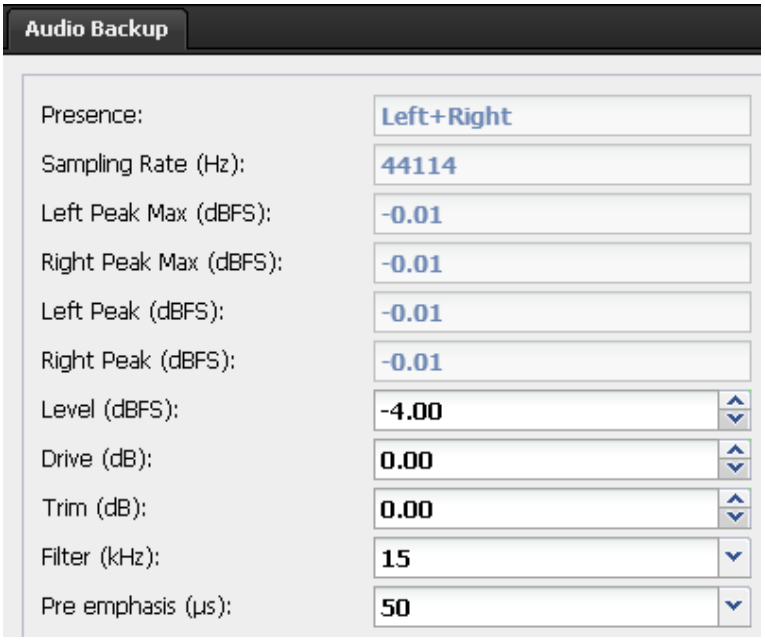
Set the MPX 1 and MPX 2 inputs on this page. Please refer to parameter descriptions section 5.9 for more details.



Audio backup

Path: **Transmitter**/Input Source/Audio Backup

Set the audio backup player on this page. The backup file is selected on the audio backup configuration page (see section 9.4.6)



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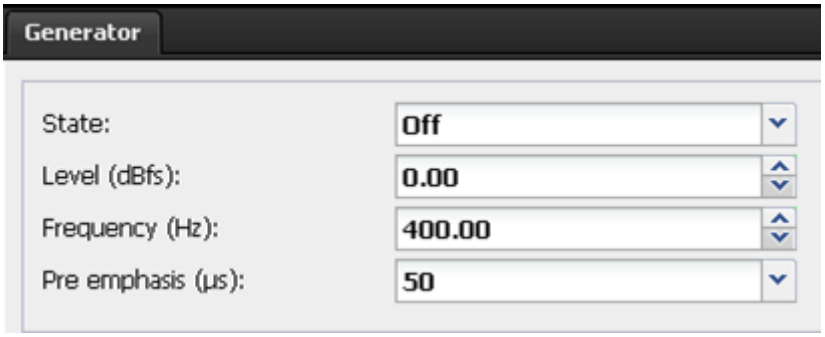
Generator

Path: **Transmitter**/Input Source/Generator

Set the internal generator on this page. Please refer to parameter descriptions section 5.11 for more details.



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9.4.6. Audio backup configuration

Path: **Transmitter**/Audio Backup/Audio Backup

Audio backup files are stored on the transmitter's µSD card.

Up to 20 audio files can be located at the root of the µSD card. The format of these files needs to be .wav (standard wav format only) or .mp3 format.

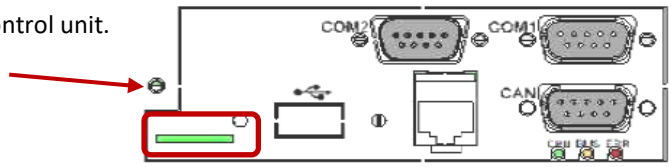
Files can be transferred via FTP or copied directly on the drive.

For an FTP transfer (preferred method), use the FTP music account (see section 9.6.7). If files are updated via FTP, refresh the list on the System/Support/System page (see section 9.6.14).

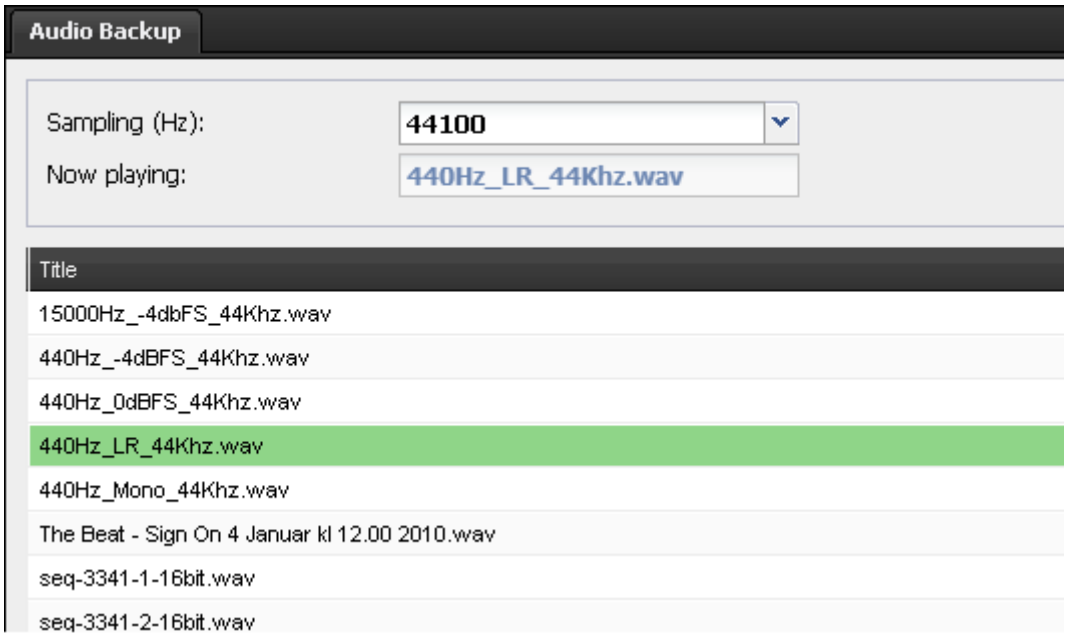
The µSD card is an external storing device meant to mostly stay in place. Removing and setting it back triggers error messages visible on the embedded web site; it should therefore only be done during maintenance operation procedures. See section 5.17 for the µSD card removal procedure.

Copy files and insert the card in the front panel of the control unit.

The reader is located on the TCP/IP board



The µSD card is used for various features, including data storage required for the warranty. To allow enough space for this data storage, make sure the audio backup files are less than 10 Gb.



The page displays files available on the µSD card.

Select the sampling rate according to the desired audio file.

To select a file in the list, double-click on its name, the line will then turn blue. Click again if you wish to unselect it.

Click then the button ✔Save to lock in your choice; the line will turn green.

An audio file is now associated with the backup feature and can be set and selected like other audio inputs; it is referred as *Player* (see sections 9.4.4 and 9.4.5).

When the Player is enabled, the selected file will play in loop and its name will be displayed as "Now playing".

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9.5. Setting the RDS data

RDS data can only be set when the RDS license is enabled on the transmitter.

Click the button RDS to access RDS data pages.

This section displays RDS parameters so they can be updated.

When values have been changed, the button Save becomes visible, click on it to save the new settings.

If the transmitter is in local mode (orange indicator at the top of the page), you will not be able to modify settings.

9.5.1. Static encoder

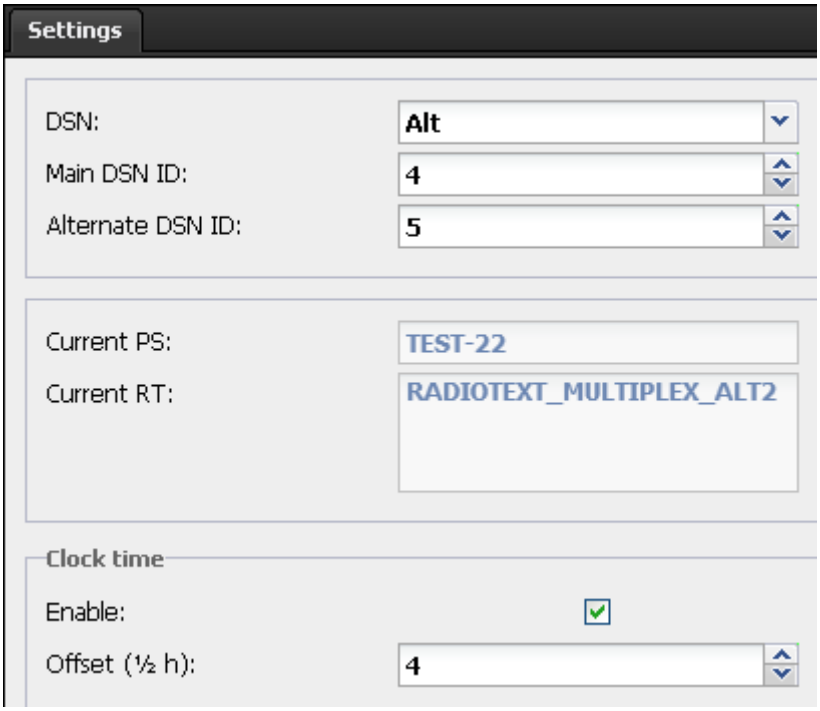
This page is available when the Static RDS option is enabled.

Please refer to parameter descriptions section 5.16 for more details.

Settings

Path: **RDS**/Static Encoder/Settings

Enter the ID of the main and the alternate DSN.



Check the box 'Clock time' to send the time in the 4A group. Specify an offset if needed.

There is no need to add the 4A group to the group sequence.

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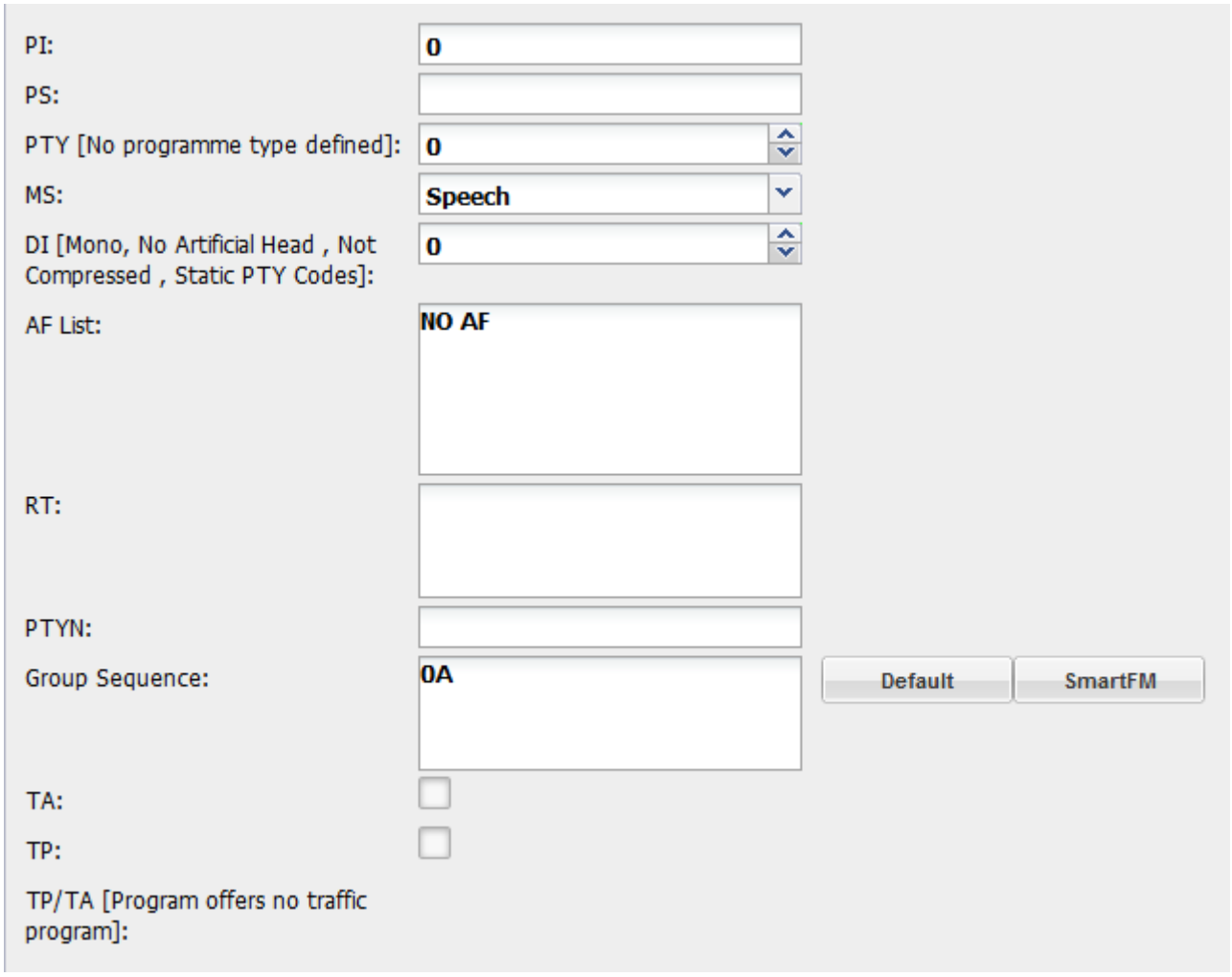
Main DSN / Alternate DSN

Path: **RDS**/Static Encoder/Main DSN (or Alternate DSN)

Set DSN parameters on these pages.



The definition of selected PTY, DI and TA/TP codes appears on the screen. They are also available section 5.16.

Enter the group sequence manually, or use the buttons to use standard group sequences: Default or SmartFM, which is to be used when SmartFM is enabled and fields measurements are run with a SmartFM compatible unit such as the AUDEMAT FM MC5.

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9.5.2. Dynamic Encoder

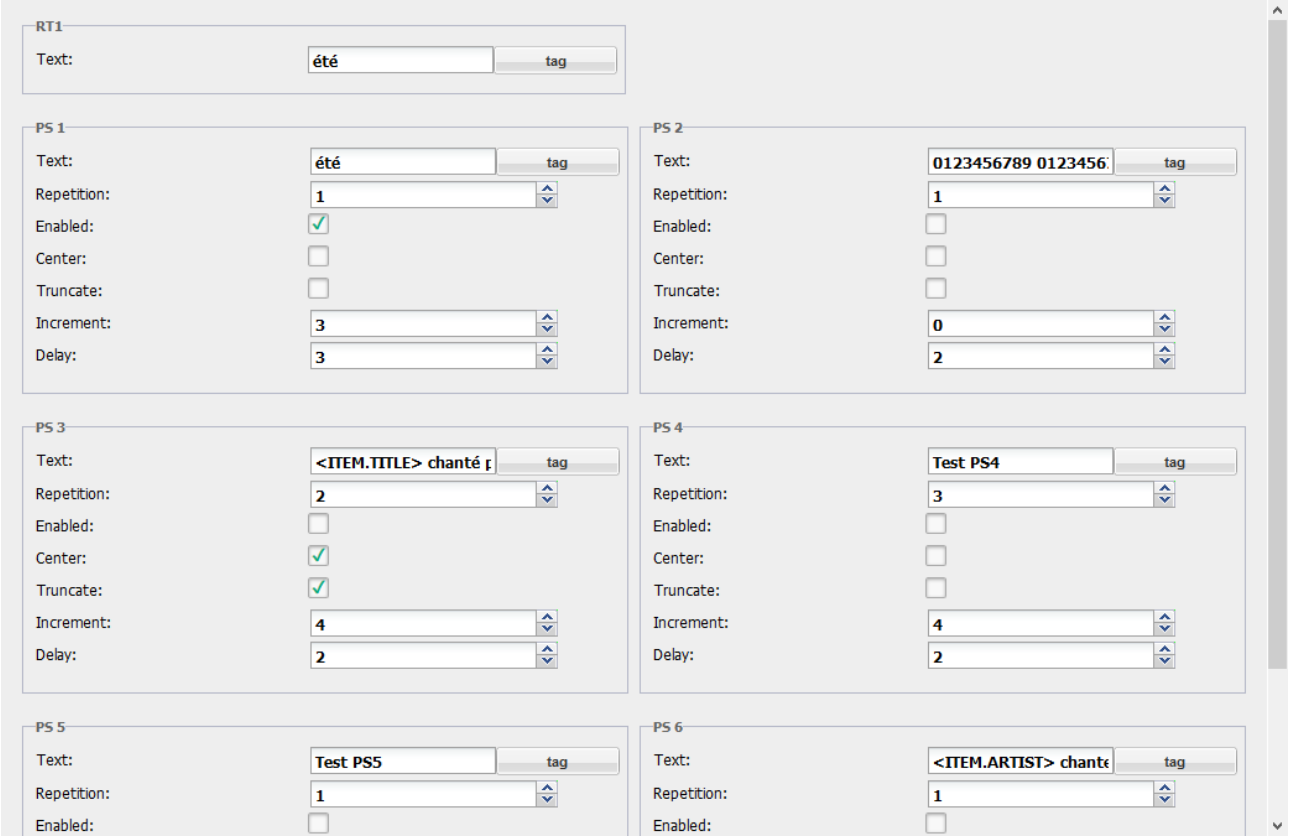
The dynamic encoder can be set using serial commands (see section 7.2.8) or the web interface but not with the front panel.

Please refer to parameter descriptions section 5.16 (PS Scroll) for more details.

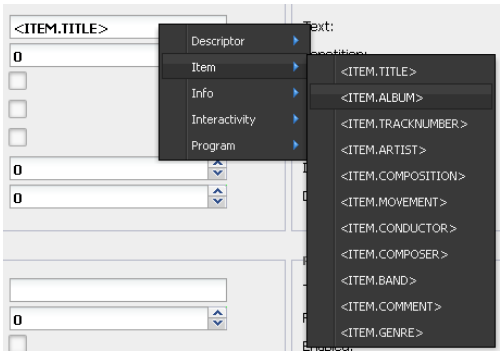
PS Scroll

Path: **RDS**/Dynamic Encoder/PS Scroll

Set the radiotext and/or the PS scroll on this page.



To insert dynamic data (<ITEM….>, <INFO…>…) in the PS text, click the Tag button and choose from the list of available fields.



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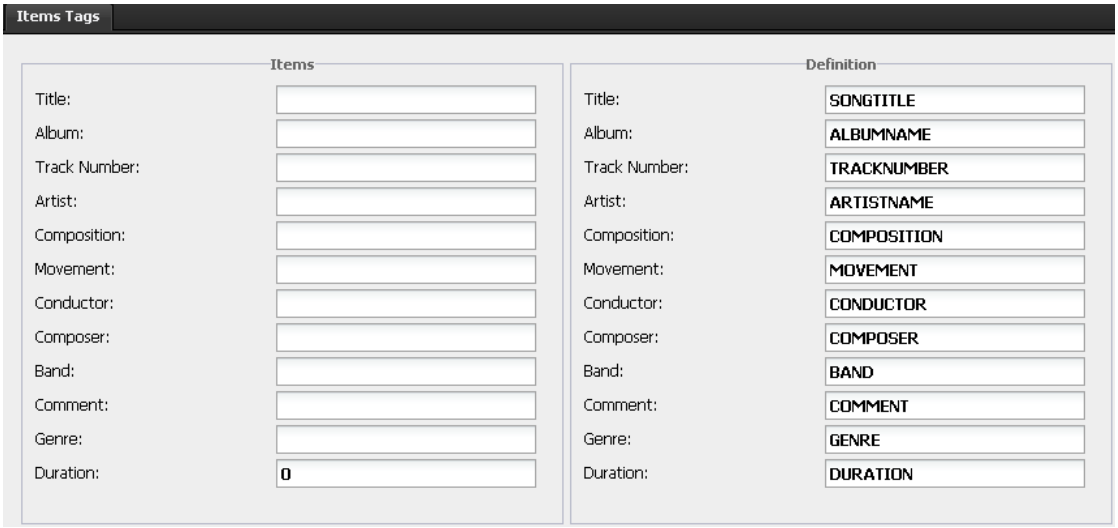
TAG pages

Path: **RDS**/Dynamic Encoder/Items Tags (or Info Tags or Miscellaneous Tags)



Dynamic fields presented on the 'Items Tags', 'Info Tags' and 'Miscellaneous Tags' pages display current data in the left column and automation command definitions in the right column. Definitions should be configured to match commands of the automation software application.

ⓘ *Each name must be unique.*

ⓘ *Automation commands are case sensitive.*

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9.6. System configuration

Click the button System to access system pages.

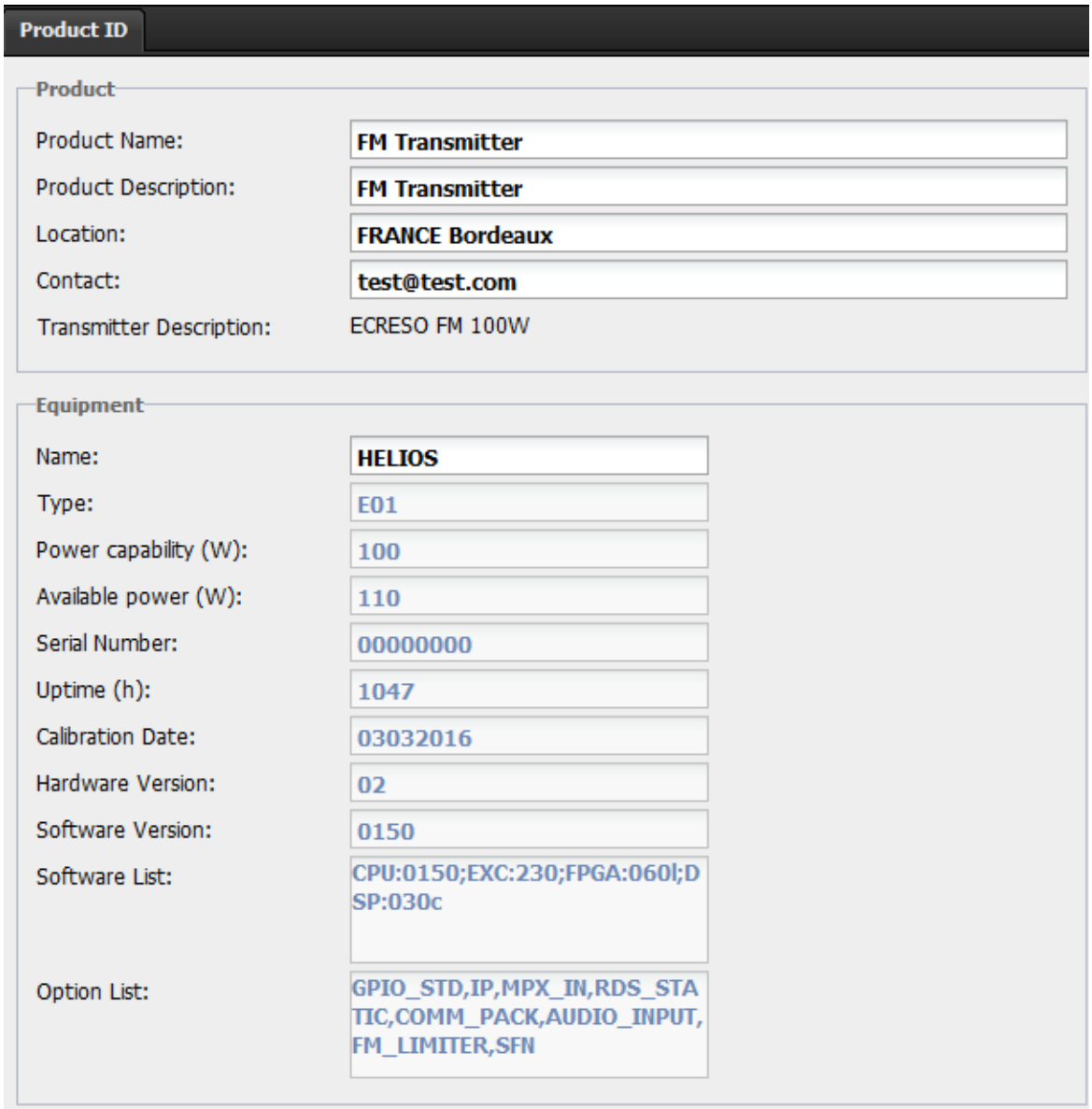
When values have been changed, the button Save becomes visible, click on it to save the new settings.

If the transmitter is in local mode (orange indicator at the top of the page), you will not be able to modify settings.

System parameters modified in the web interface are updated in the unit after a one minute delay.

9.6.1. Product ID

Path: **System**/Product/Product ID



General information regarding the transmitter: name, serial number, versions…

Use the product name and product description to adequately and uniquely describe your unit. They are useful in a network environment to identify it.

Specifically, these values are sent with SNMP traps.

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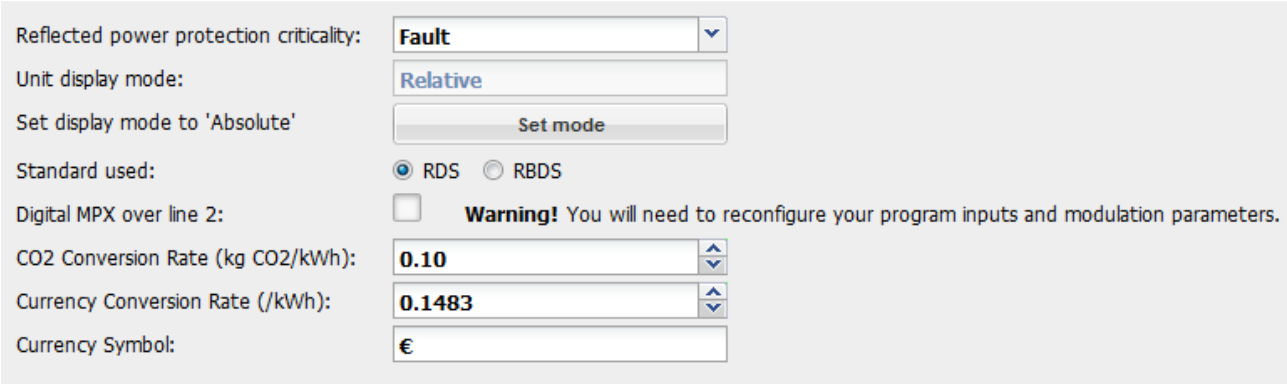
9.6.2. Product configuration

Path: **System**/Product/Configuration



Set the reflected power protection criticality and the unit display mode (absolute or relative).

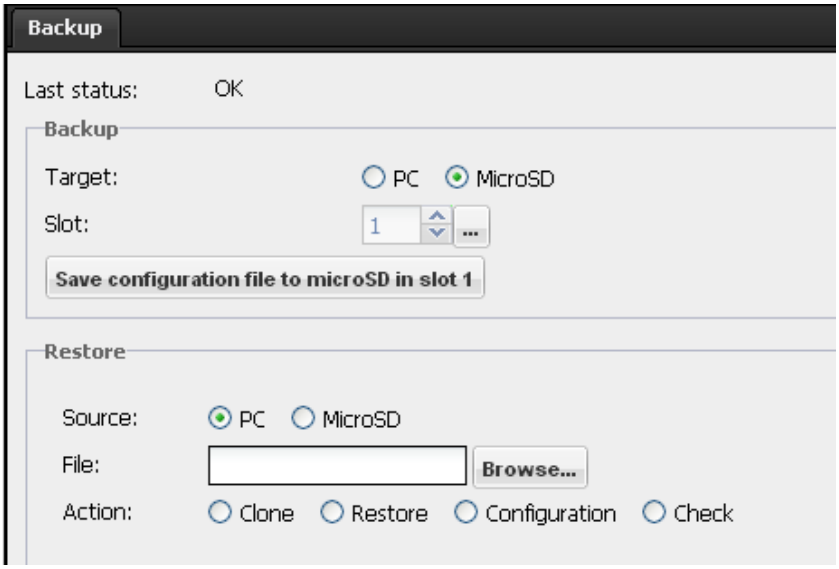
Check the box if line 2 is an MPX input, uncheck if line 2 is an audio input.

When Line 2 is set as a digital MPX input, set the MPX 3 and MPX 4 parameters in the Transmitter configuration pages (section 9.4).

Set the parameters with which SmartFM savings are calculated.

9.6.3. Product Backup

Path: **System**/Product/Backup



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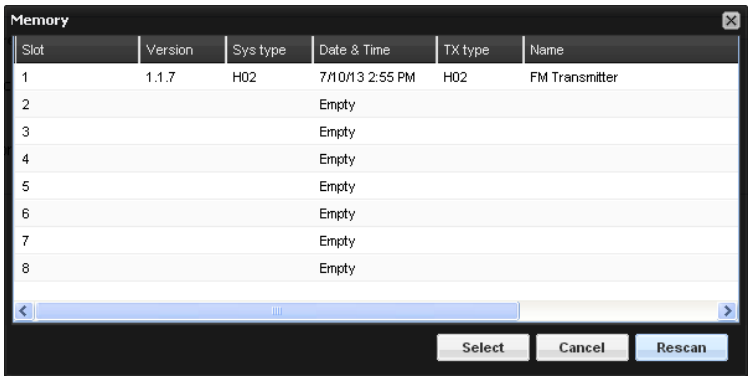
Backing up the transmitter configuration:

Select the media on which to back up.

On the PC, the backup file is saved on the web browser download directory. Its name is: FmNgIP_*version_serial-number_date_time.*

On the µSD card, click “Rescan” to display the content of the card and select the slot. Up to 8 configurations can be used for presets (see section 9.4.2).



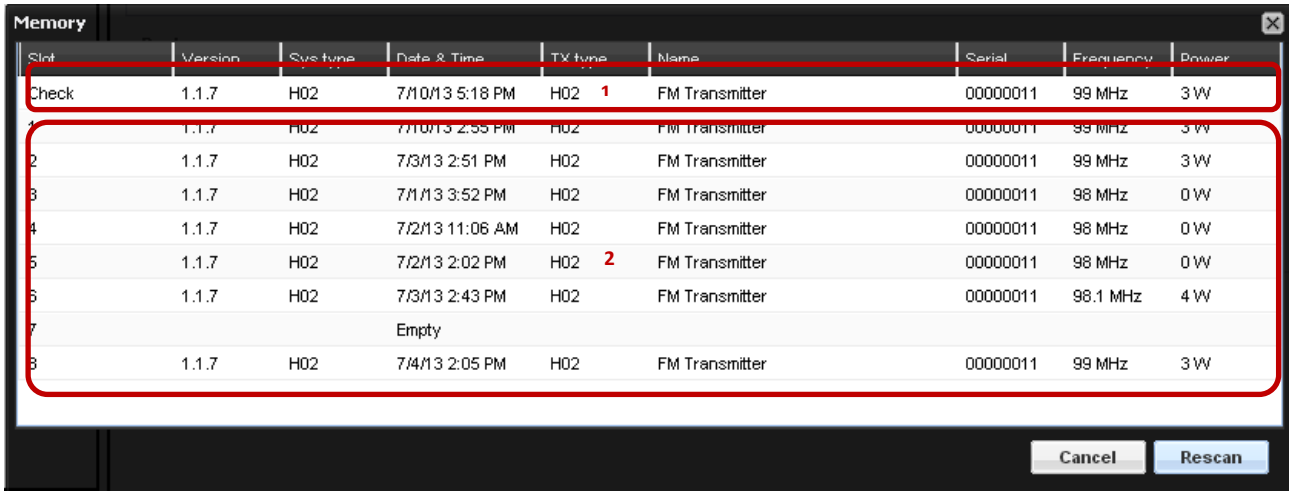
Restoring the transmitter configuration:

If the backup file is on the PC, browse to select it.

If the backup file is on the µSD card, click “Rescan” to display the content of the card and select its slot.

You may then choose to:

- Clone: the whole configuration embedded in the unit is restored, except for the EMR configuration. It can be used to restore a unit after it has been serviced.
- Restore: the whole configuration embedded in the unit is restored, except for the EMR configuration and the network configuration. It can be used to set two transmitters identically.
- Configure: the transmitter configuration is restored, ie, RF configuration, input configuration, RDS configuration and presets.
- Check (only available on PC): no restoration, but the main backed up parameters are checked (1) and can be compared to parameters saved with the 8 memories (2).



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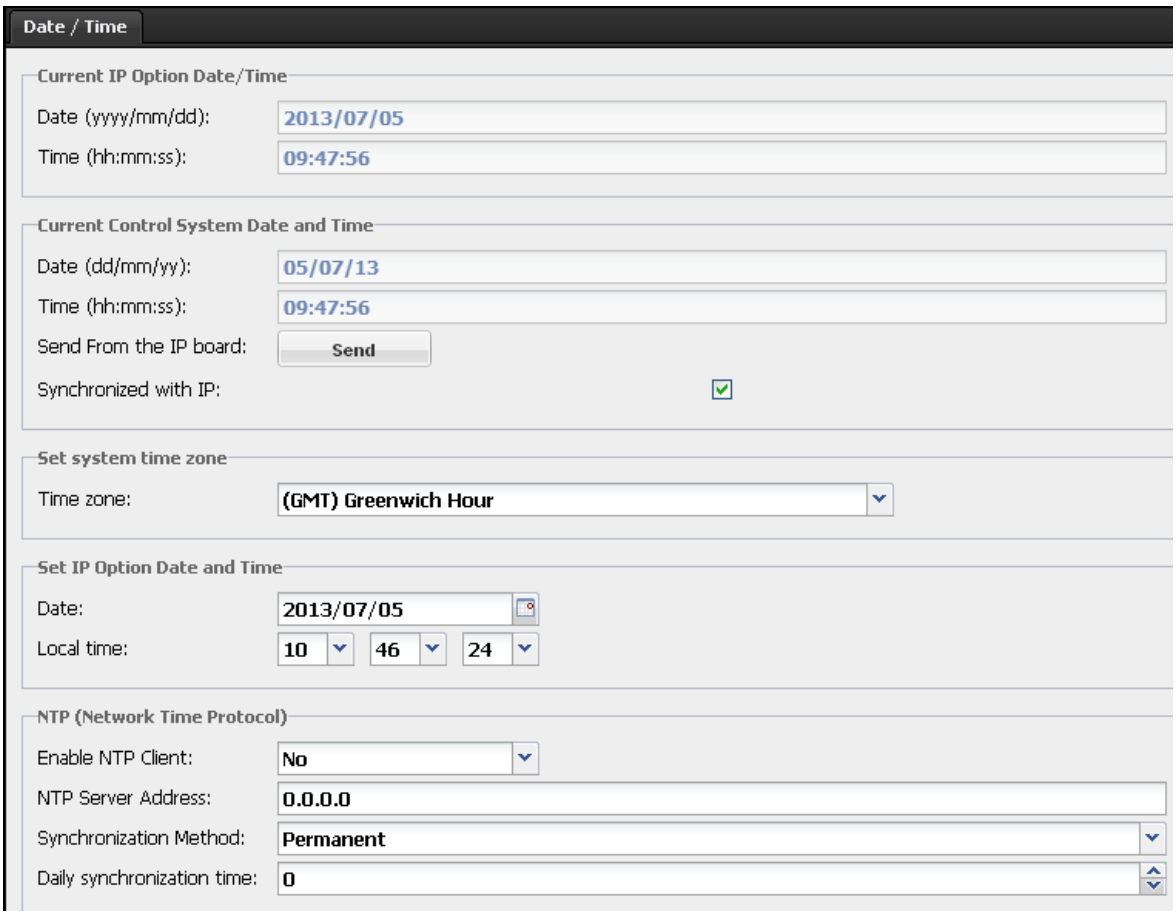
9.6.4. Date / Time

Path: **System**/Date/Date / Time



A couple of Ecreso FM internal components are fitted with a clock. This page allows you to make sure they are synchronized. The IP board clock can be set on this page: it can manage time zones and will be used as reference for the system clock which cannot manage time zone and which is used for RDS.

Set the time zone first! Changes in the time zone affect the time that is displayed in the system time window, so setting the zone first will eliminate the need to set the system time twice!

- **System date:** it can be updated manually by clicking the “Send” button or automatically by checking the synchronization box. The IP board time and date is then applied to the system time and date.

- **Set system time zone:**

  The user selects the geographical zone from the list. Important to have this set correctly when using an NTP server.

- **Set system date:** the user may update both date (year/month/day) and time (hour/minute/second) of the IP board clock.

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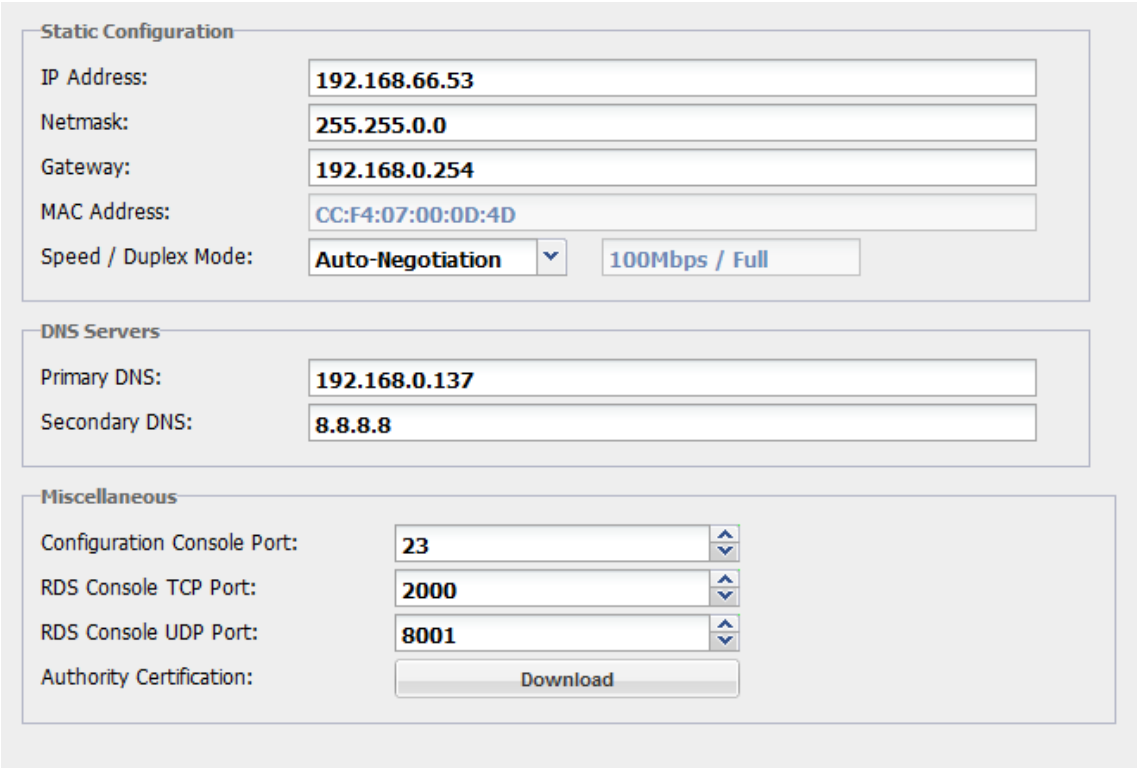
➢ **Network Time Protocol:** NTP update

The user can enter up to two time server addresses to update the IP board clock automatically. Make sure these addresses can be reached by the unit; specifically, the gateway must be properly set. When using two servers, separate both addresses with a coma. Specify whether it should be synchronized continuously or periodically. For periodic synchronization, indicate what time the daily synchronization should occur (between 0 and 23).

9.6.5. Network

Path: **System**/Communication/Network



IP Configuration:

- **Static Ethernet configuration**

  Set the parameters for the network interface.

  Set also the speed and duplex mode of the network interface: 10Mbps/Full, 10Mbps/Half, 100Mbps/Full, 100Mbps/Half, 1Gbps/Full. To let the module select the speed and mode according to the environment, choose ‘auto-negociation.

- **DNS Servers:** DNS configuration. Mandatory if before using DNS addresses on other configuration pages.

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- **Authority Certification:**

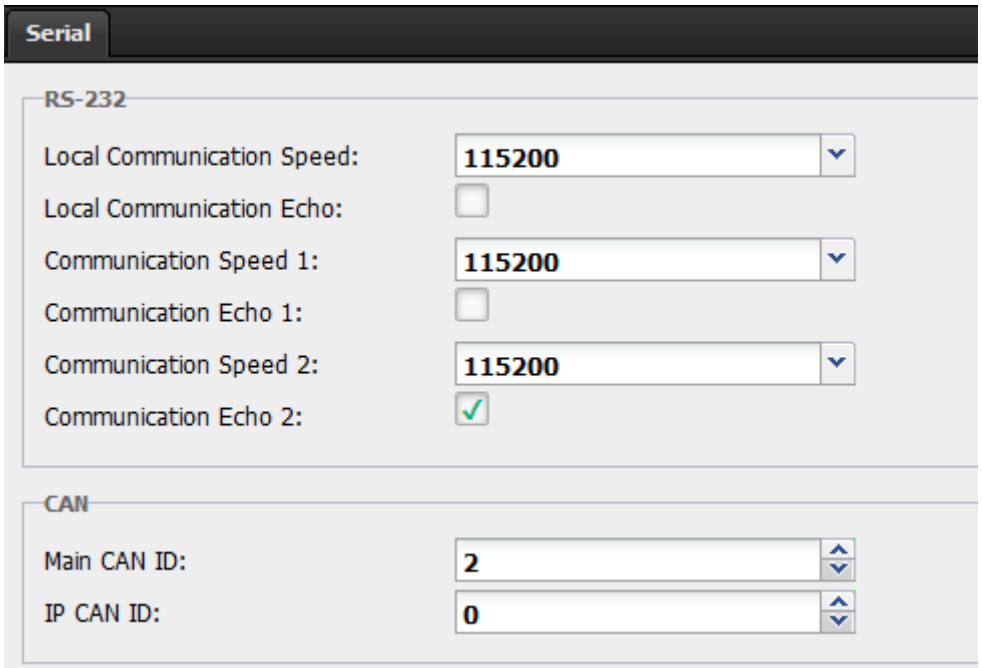
To prevent potential blocking and warning messages, WorldCast Systems now supplies certificates for HTTPS browsing.

  - Download the certificate,
  - Display the advanced parameters of the web browser (Mozilla Firefox, Google Chrome) or the Internet Options/Content (Internet Explorer, Microsoft Edge).
  - Open the certificate manager and import the certification previously downloaded.

This certification is also valid with other WorldCast Systems products of the latest generation.

9.6.6. Serial communication

Path: **System**/Communication/Serial



Parameters of the communication board.

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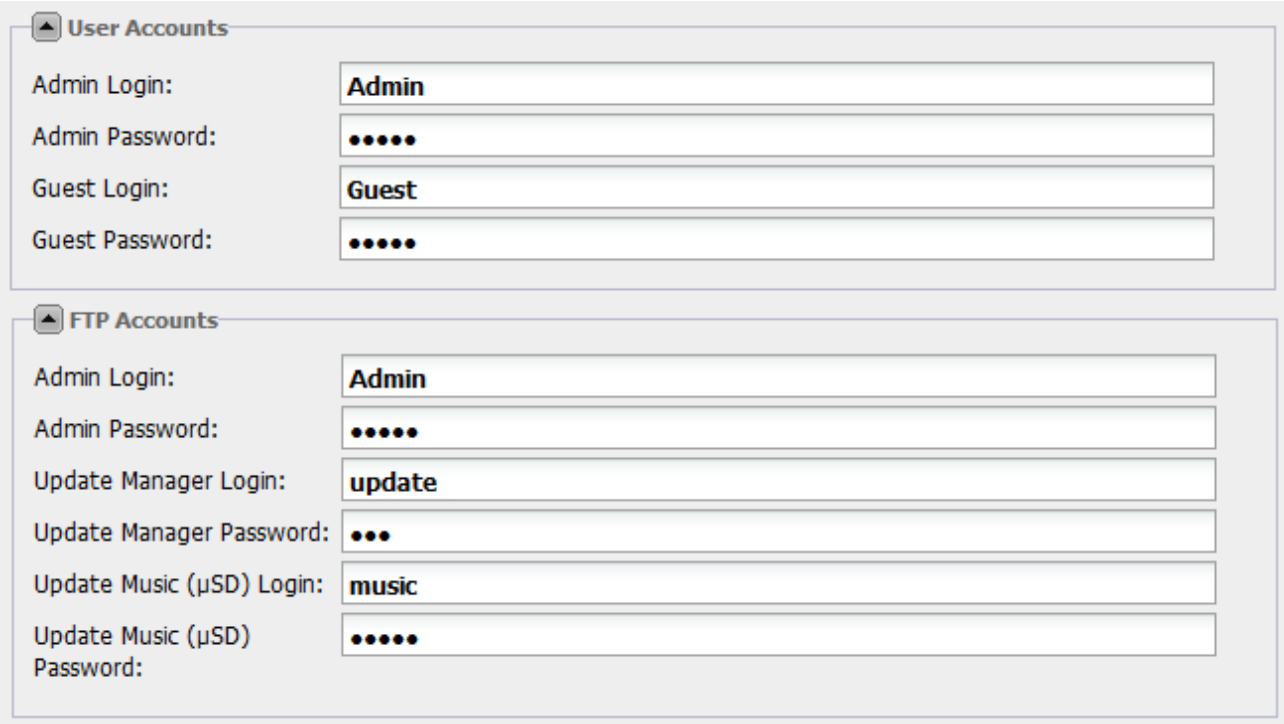
9.6.7. Users

Path: **System**/Accounts/Users



This is where web site connection settings can be modified. This page is only visible to administrators.

Two web and software accounts are available:

- Administrator (Admin / admin by default). The administrator has full rights
- Guest (Guest / guest by default). The guest has read-only access to all pages except the user management page. The guest can download logs.

Three FTP accounts are available:

- Administrator (Admin / admin by default). The administrator has full rights
- Update manager (update / maj by default). This account is only used for software updates.
- Music account (music / music by default). This account is used to connect to the SD card. It allows uploading and managing audio files for audio backup.

ⓘ *You may change login names but make sure each is unique!*

ⓘ *Only use alphanumerical characters for user names and passwords.*

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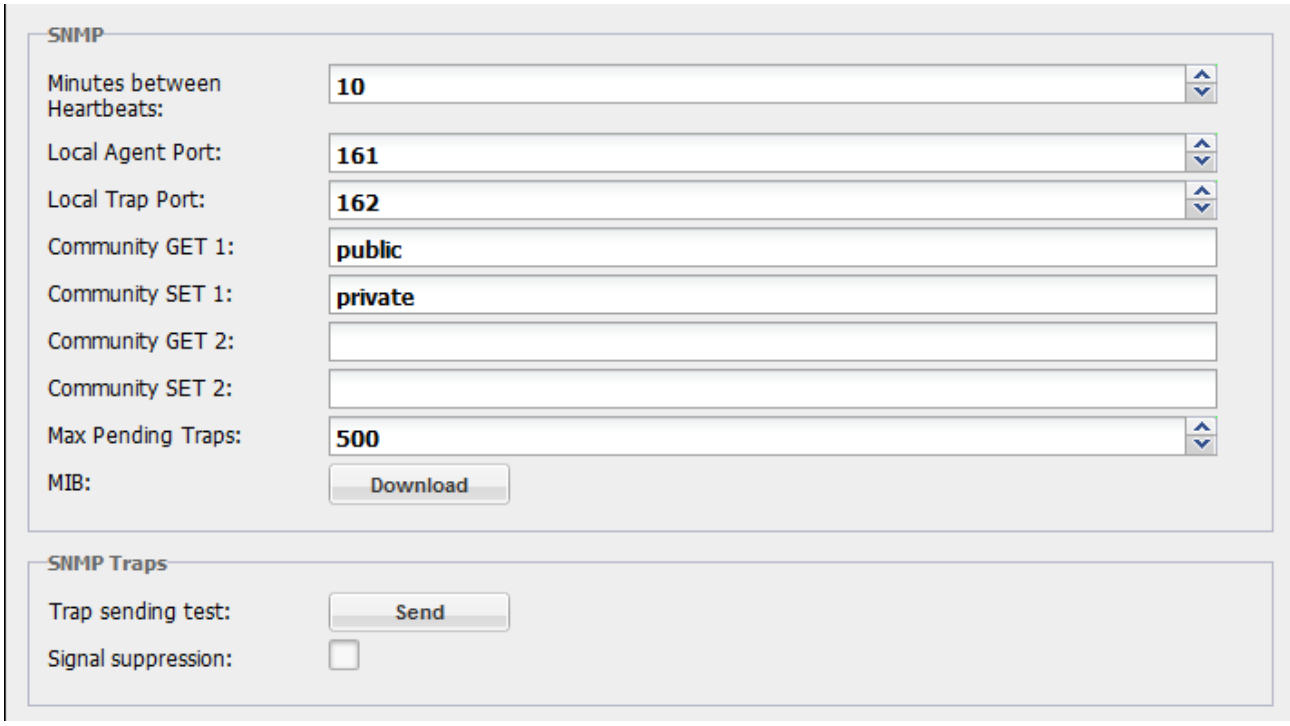
9.6.8. SNMP Agent

Path: **System**/SNMP/SMTP/SNMP Agent

SNMP parameters are on both the SNMP Agent page and the SNMP Manager page.



- **SNMP**

Minutes between Heartbeats: sends the heartbeat every X minutes. This trap makes it possible to check that the unit is connected to the network.

Local ports: set the ports on which the traps are sent.

GET / SET communities: Set whether a community is private or public. GET 2 and SET 2 communities can be used for a second manager (up to four managers can be set, see next section) or for test and maintenance.

Max pending traps: set the number of traps in the manager queue, between 255 and 1000.

MIB: to download the MIBs click on the button. The mibs.zip file includes the Ecreso MIB and the IRT MIBs.

- **SNMP Traps**

Trap sending test: enables the user to carry out a test according to the trap settings.

Signal suppression in local mode:

- If the box is checked, as soon as the transmitter is in local mode, SNMP GET return the value undefined and SNMP traps are no longer sent. SNMP traps start being sent again when the transmitter is no longer in local mode.

  It is useful to prevent generating traps while in maintenance.

- If the box is not checked, SNMP GET return the current value and traps are sent even in local mode.

If the transmitter is part of an N+1 system with Ecreso N+1, this mode must be disabled to ensure the system will work properly.

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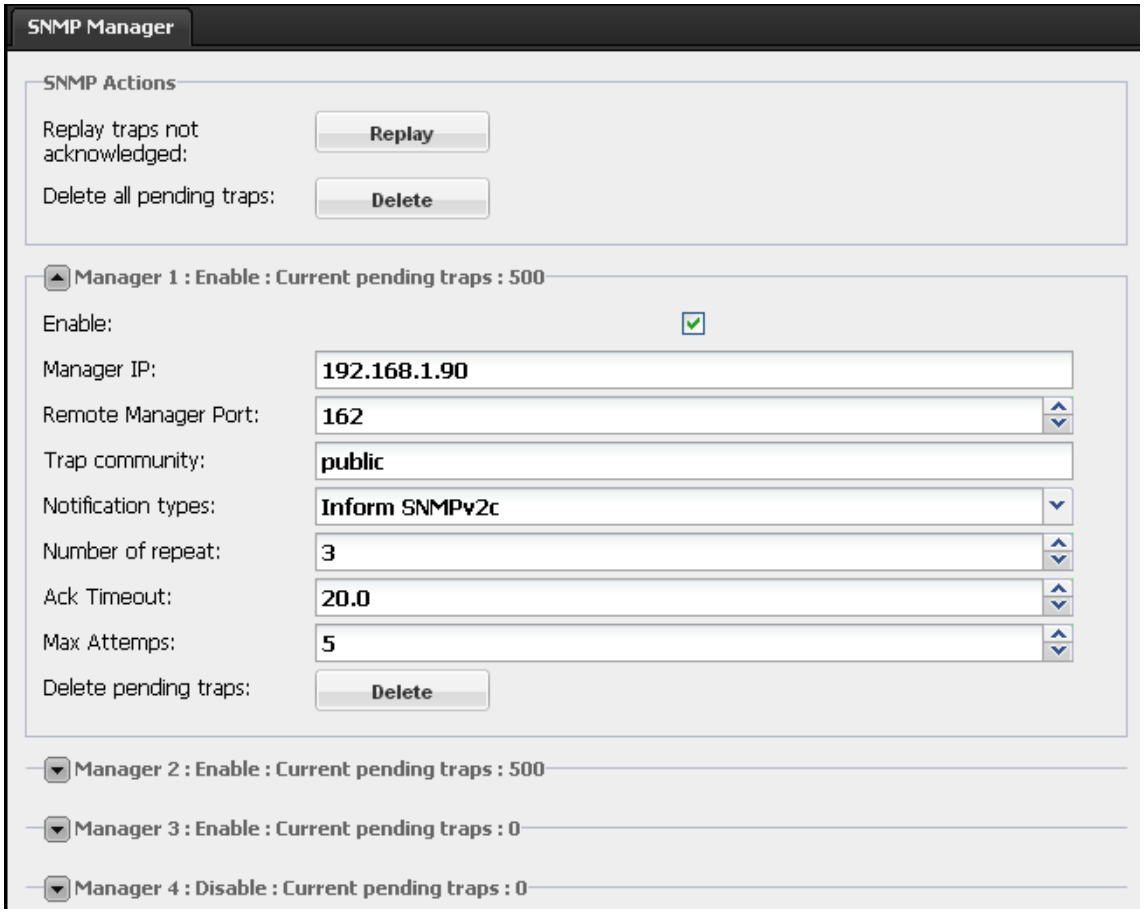
9.6.9. SNMP Manager

Path: **System**/SNMP/SMTP/SNMP Manager



- **SNMP Actions**

  The user may replay traps that have not been acknowledged yet.

  The user may also delete pending traps that have not been acknowledged yet.

- **SNMP manager settings**

  - The equipment enables multiple addresses to be configured for SNMP notifications. Any of the configured managers can acknowledge traps.

  The unit is compliant with SNMPv1 and SNMPv2c versions. Notifications can be transmitted as SNMPv1, SNMPv2c or Inform SNMPv2c type traps. Select the notification type for all traps of a given manager

  SNMPv1 and SNMPv2c type traps are sent *n* times (Number of repeats) before they are deleted from the queue.

  - **Case of Inform SNMPv2c type traps:**

  Inform SNMPv2c traps require manager acknowledgment.

  A trap is sent *n* times (Number of repeats) and stored in a queue.

  If the trap is acknowledged, it is deleted from the queue.

  If the trap is not acknowledged, it will be sent up to *m* times (Max attempts) in a *t* delay (Ack timout). After *m* tries, the trap is deleted even if it has not been acknowledged.

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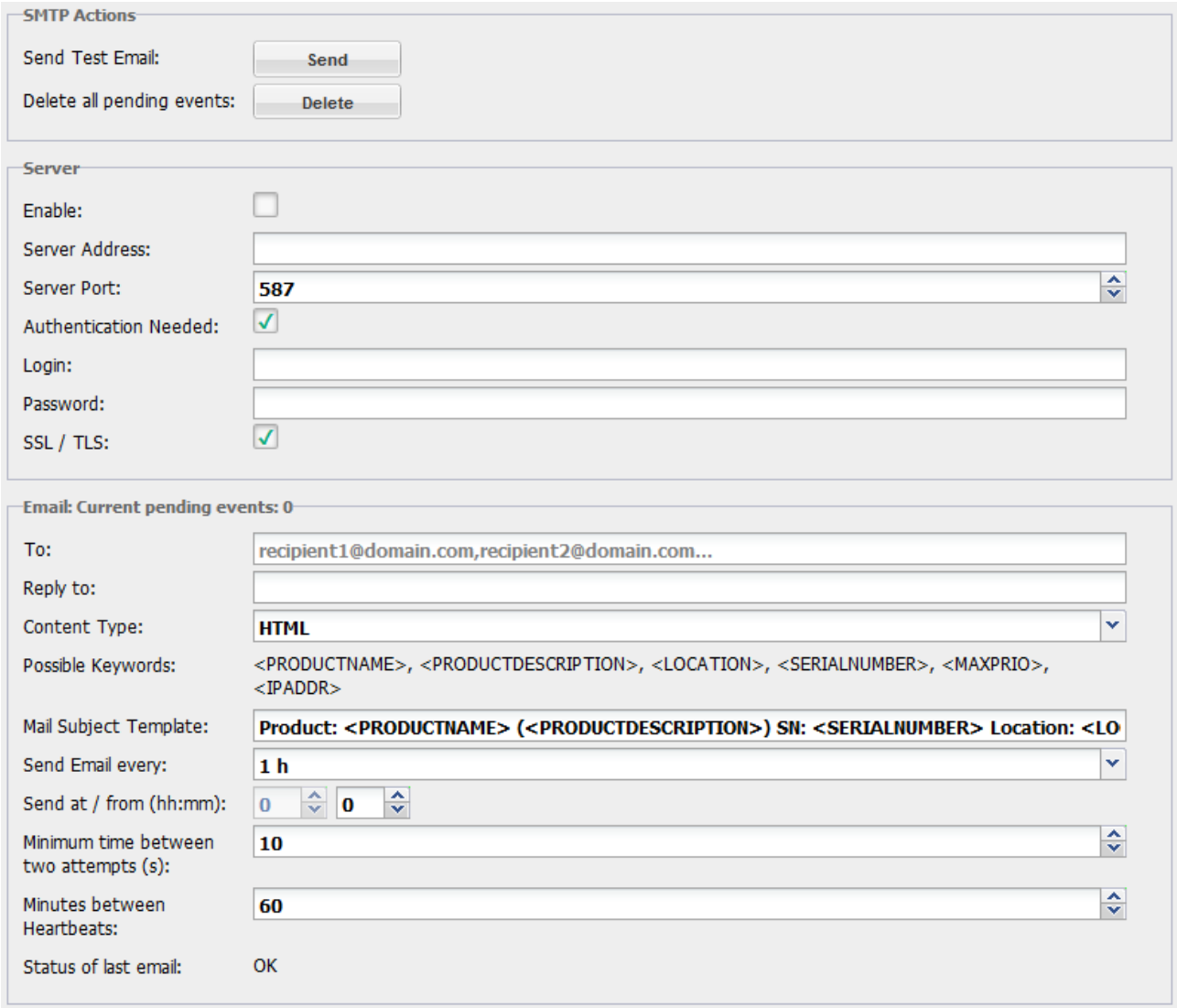
The queue uses the FIFO principle. It the number of traps in the queue becomes too great, the oldest traps will be deleted, even if they have not been acknowledged. The size of the queue is set on the SNMP Agent page (Max pending traps).

9.6.10. SMTP Client

Path: **System**/SNMP/SMTP/SMTP Client



➢ **E-mail Configuration:**

- Enter the SMTP server address server port, account information to enable sending of e-mail alerts. Ask your network administrator for the SMTP parameters. Note that you must have a valid DNS setup if you want to use SMTP host name. Otherwise you must use a numeric IP address xxx.xxx.xxx.xxx.
- "Send mail every" enables the user to send messages in a batch every "X" minutes if desired. When waiting for the time chosen by the user, the unit stores the messages. If the value is 0, the unit sends messages as they are issued.
- Two fields are available that allow the user to configure the contents of the subject line and the first line of the body of the alarm e-mail. Any text entered in these windows will be included, and there is a list of variables (in brackets) that can be included as well. This feature allows the user to customize the first parts of the alarm e-mails to be more compatible with portable devices.

! ***If using a Hotmail mail server, the Login email address and the Reply to email address must be identical.***

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List of available keywords:

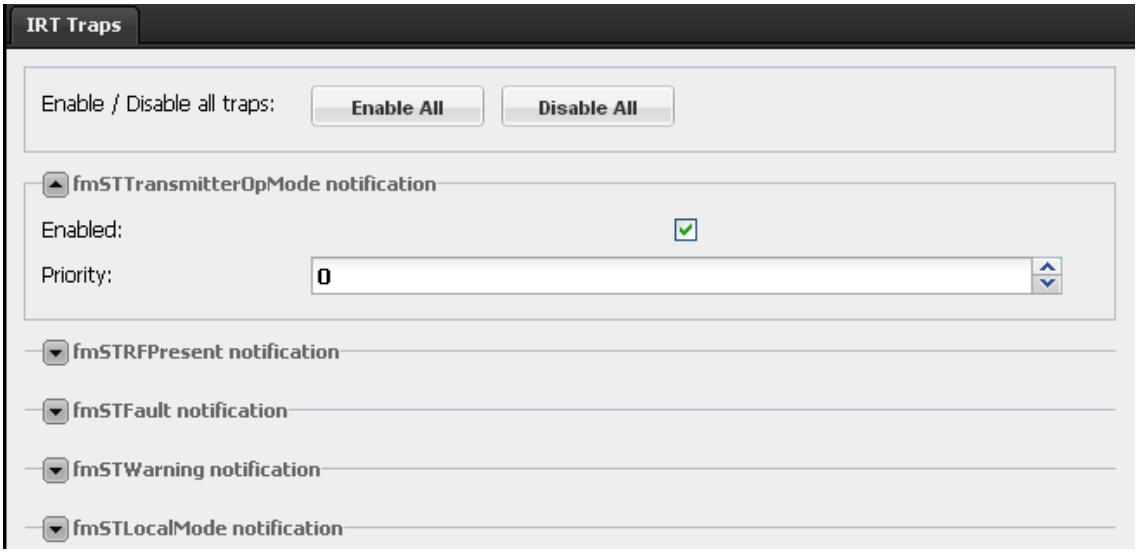
Name	Description	Can be inserted in the **subject of the mail**	Can be inserted in the **1st line of the mail**
{NAME}	Product name	✓	✓
{DESCRIPTION}	Product description	✓	✓
{LOCALADDRESS}	Product IP address	✓	✓
{SERIALNUMBER}	Product serial number	✓	✓
{FIRSTALARM}	Name of the 1st alarm	✓	

If a text address is set, the DNS must be configured so as to allow name resolution.

Make sure the gateway is correctly configured for the unit to be able to reach the SMTP server ("Network" page).

9.6.11. IRT Traps

Path: **System**/SNMP/SMTP/IRT Traps



On this page, set standard IRT traps.

Click the arrow next to the trap name to display its parameters.

- To enable the trap, check "Enabled" (replaces the "Do not send option" of the Common traps)
- Set the priority; this information which is sent with the traps can be used by an SNMP Manager as filter criteria for instance.

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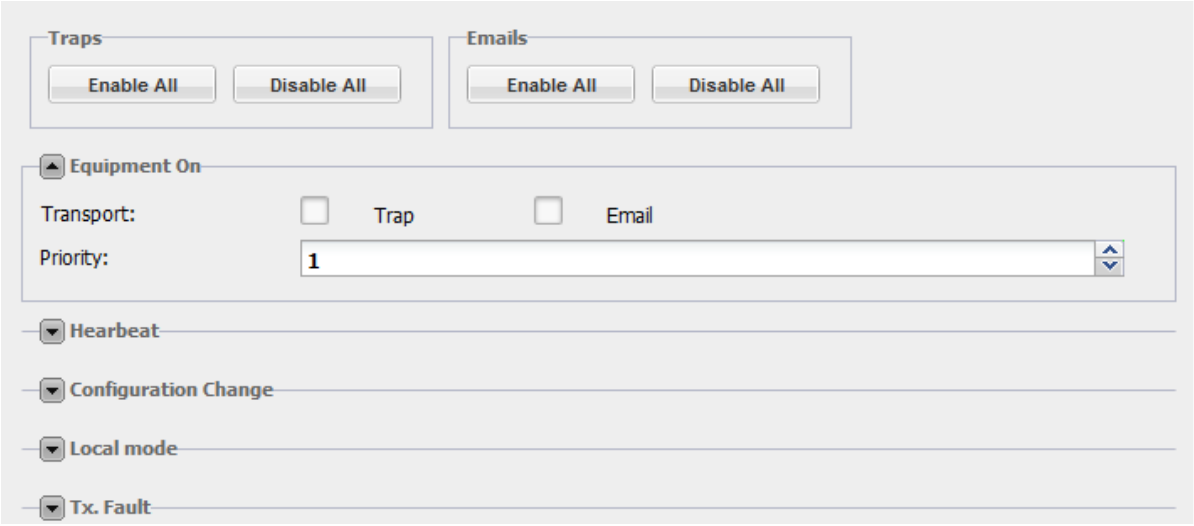
9.6.12. Manufacturer Traps/Emails

Path: **System**/SNMP/SMTP/Traps/Emails



Manufacturer traps are configured like IRT traps (see previous section).

However, these traps can also be sent by email. Before you do so, make sure the SMTP client is properly set (see section 9.6.10).

List of Manufacturer traps:

- Equipment On
- Hearbeat
- Configuration Change
- Local mode
- Tx. Fault
- Tx. Warning
- 3 dB Alarm
- VSWR Alarm
- Interlock
- RF On
- RF Present
- SmartFM Status
- SmartFM Alarm
- Sys. Fault
- Sys. Warning
- Sys. Alarm Ambient
- Sys. Alarm Volt Aux.
- Input Alarm Switch
- Input Alarm Fault
- 1 dB Alarm
- Standby
- Input Alarm Line *n* / MPX *n*
- Input Alarm Player
- Invalid Data
- Logging Alarm
- Activation License Alarm
- RDS License Alarm
- Sound Processor License Alarm
- SmartFM License Alarm

No trap is sent on automatic audio switch.

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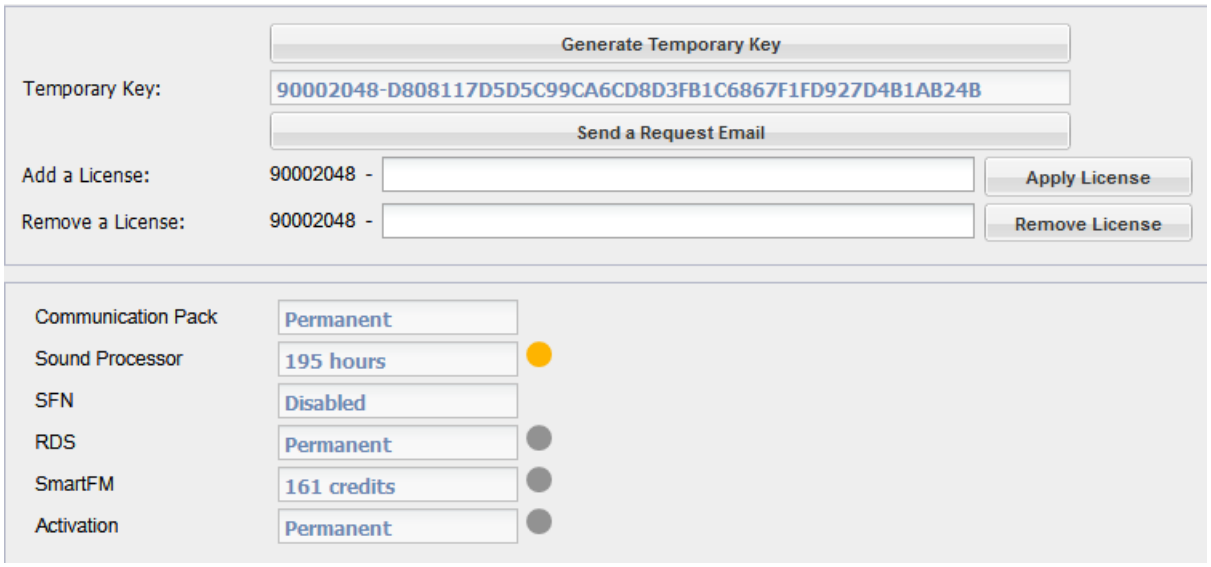
9.6.13. License

Path: **System**/Support/License



On this page, view the current licenses, and set new ones.

Some options are available either as permanent or as temporary licenses: Sound Processor, RDS, SmartFM and Activation.

For these licenses, a yellow indicator warns when there are less than 30 days left.

See Appendix A for more information.

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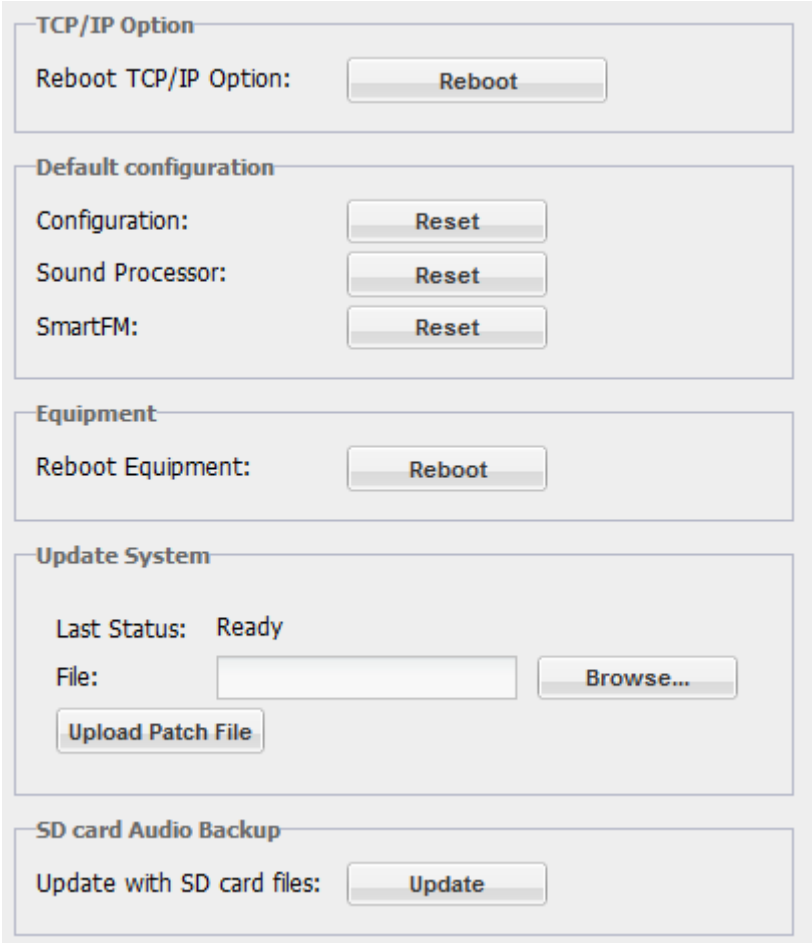
9.6.14. System

Path: **System**/Support/System



With the 'Reboot' button, restart the **TCP/IP board**.

Erase your system **configuration** and reset it to default with the Reset button.

! ***After a configuration reset, we recommend you check parameters meant to protect the transmitter: hard clipper activation/deviation and VSWR Trip.***

Sound processor factory presets have been improved in version 1.7. The Reset button replaces the transmitter's existing presets (version 1.6 factory presets or user-modified presets) with version 1.7 presets.

To be able to test new presets will keeping the previous ones, simply export your old presets before resetting, then import selected presets (see section 10.3.2 for more information on exporting/importing presets).

To reset SmartFM history, press the Reset button. Historical data will be erased so savings values will no longer be available. Remaining SmartFM credits will however not be affected.

! ***Wait for the IP connection to be available before shutting off the unit.***

With the **equipment** Reboot button, restart the transmitter's front panel.

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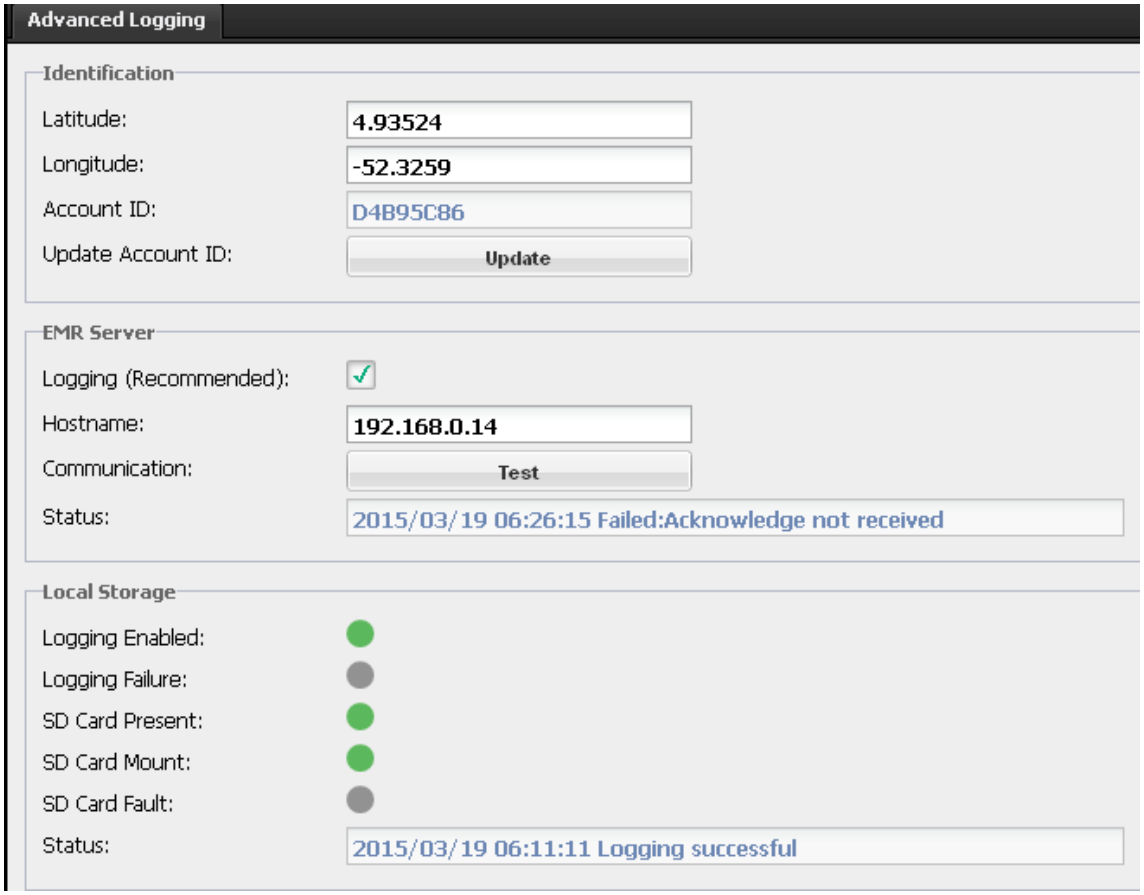
Update System: if a new version of the transmitter becomes available, you may receive the update patch file from your Ecreso dealer.

Click the Browse button to locate it, and once located, click the Upload Patch File button. After the upload process is done, the transmitter's version can be checked on the Product ID page (see section 9.6.1). Depending on the version, the time for upload may vary.

SD card Audio Backup: if the audio backup file on the SD card has been updated via FTP, click the button to refresh the list.

9.6.15. Advanced Logging

Path: **System**/Support/Advanced Logging



On this page, manage EMR information and view the status of local storage.

EMR is a service offered to monitor your Ecreso FM transmitters' performances.

The transmitter is connected via IP to the EMR server which collects data.

A private connection to the server gives access to:

- The status of your transmitters (including key values and associated advices)
- A report over the last month and/or week with cumulated values and the last known state of the transmitters
- A map representation of your network.

In addition, a periodical report is supplied giving you the state of the transmitters; this report may suggest corrective or preventive actions to solve potential issues or improve the performance of the transmitters.

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If you have subscribed to this service, you will need to set your transmitter so it can communicate with the EMR server.

Identification

- Enter its position. It will be used by EMR for mapping purposes.
- Enter your EMR account ID as supplied by WorldCast Systems:
  - Click the Update button
  - Enter the account in the Update Account ID window
  - Click the Apply button

  With an IP connection but no personal EMR account number, data is sent to the EMR server. If you wish to deactivate data recording, uncheck the 'Logging' check box.

EMR Server

- Check the box to enable EMR.
- Enter the IP address of the EMR server (or web address)
- Save the configuration and click the Test button to check there is proper communication between your transmitter and the EMR server.

For more information about using EMR, please see chapter 12.

! ***EMR is only available for compact transmitters.***

Local storage of readings

Transmitters in version 1.2.2 minimum and with a µSD card automatically store data for the after sale services. In case of issue, this data can then be analyzed for a better diagnosis (see section 1.2.2).

Please refer to parameter descriptions section 5.17 for more details on µSD card management.

The indicators show:

Logging Enabled	●	Logging on the µSD card is disabled (older transmitters)
	●	Logging on the µSD card is enabled
Logging Failure	●	No logging fault
	●	Logging failure on the µSD card
SD Card Present	●	µSD card not present
	●	µSD card present
SD Card Mount	●	µSD card ready to unmount
	●	µSD card is mounted
SD Card Fault	●	µSD card ok
	●	µSD card alarm

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9.7. About

Click ? to open this window which displays information regarding the web application.

It also gives you access to the chat window (see next section).

9.8. Chatting with other users

The icon allows connected users to chat. When you click on it, the Chat box opens.

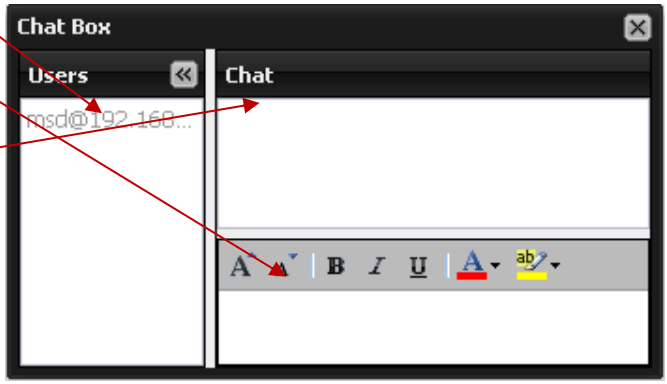
Users are identified by their screen name and their PC IP address.

Simply type your message which can be formatted and press the keyboard Enter key to send it. Press Shift+Enter to start a new line.

Messages written by other users are visible in the top right panel.

This box can stay open without preventing access to the site's main functions.

If the window is closed and then reopened, the previous messages remain available.



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10. SOUND PROCESS

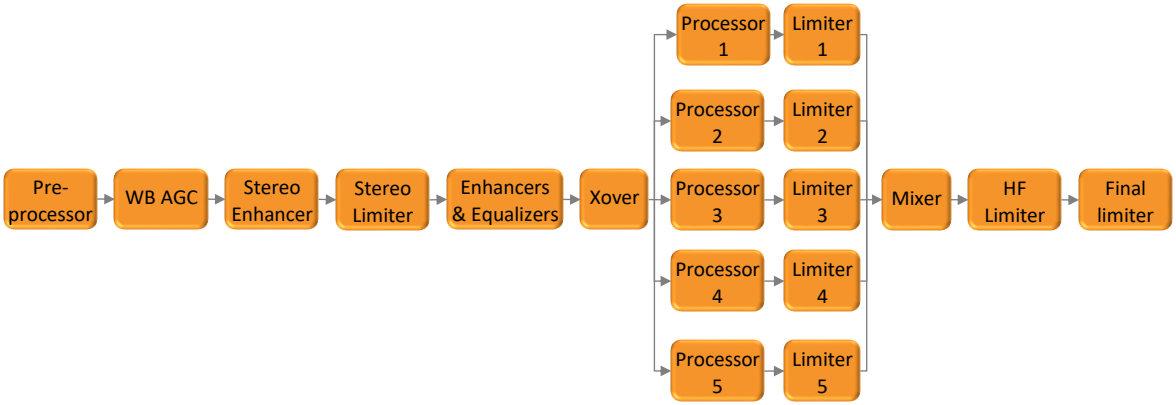
10.1. Overview

The 5-band sound processor is a cost option. Without the license, available features are limited.

The Ecreso FM features an integrated 5-band sound processor. This fully digital sound processor offers a unique signal quality and outstanding reliability as no additional hardware is required.

All processing calculations are performed by the direct to channel digital modulator, from audio to RF signal.

Here is a block diagram of the processor:



10.2. Presets

There are two types of factory presets:

- WB presets (wide band)
- 5B presets (five bands) - only available with the Sound processing option)

Unlike many processors, there is no 'bypass' preset, but a real bypass parameter (see parameter description below).

The presets WB PROTECT and 5B FINALIZE are dedicated to protect your broadcasting chain against over-deviation without audible distortion.

All other presets can be used as unique processor or secondary processor in your chain. Don't hesitate to try several presets from the list without taking their name as a main criteria choice. Those are only very general indications. Depending on your format, your expectations and the other radios available in your area, the best preset for you can be any of those. As soon as you identify a preferred preset, feel free to you use it as is, or fine tune a few parameters to better match your needs (see next sections)

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Wide Band presets

Wide band presets	Factory Preset Name	Description
1	WB PROTECT	A transparent protection without additional gain or loudness, it only makes sure not to exceed your maximum deviation.
2	WB CLASSICAL	To finalize your program in a very soft and purist way.
3	WB DIGIPLEX	This preset is fully compatible with FMX Digiplexer. The user will only need to adjust the AGC drive and the Final Limiter to get the level as it was on the previous unit.
4	WB BOOST	This wide band preset can boost your loudness and offer a more flattering sound. If you have the 5 band license on your transmitter, it can also be used to enhance and control your stereo image.

5 Band presets (only available with the Sound processing option)

5 band presets	Factory Preset Name	Description
5	5B FINALIZE	A more efficient protection as it uses the 5 band structure configured in a transparent way. It ensures not to exceed your maximum deviation.
6	5B CLASSICAL	A very purist and clean preset to adapt soft and classical format to FM broadcasting.
7	5B NATURAL	Neutral and efficient preset to embellish the sound while keeping a spectrum similar to the input source.
8	5B JAZZ	Ideal for jazz but not only, this preset offers a flattering sound, still purist, combined with a perfect control of the peaks
9	5B HOT	More basses and high frequencies for this all-around preset.
10	5B AC	Strong sound, power and loudness. Ideal for rock or commercial formats
11	5B CHR	Very powerful preset for commercial stations, with a strong presence in the medium-high frequencies.
12	5B URBAN	Very powerful preset for stations looking loudness and basses.

All factory presets can be downloaded on the WorldCast Systems website.

Presets management is available on the web site, see section 10.3.

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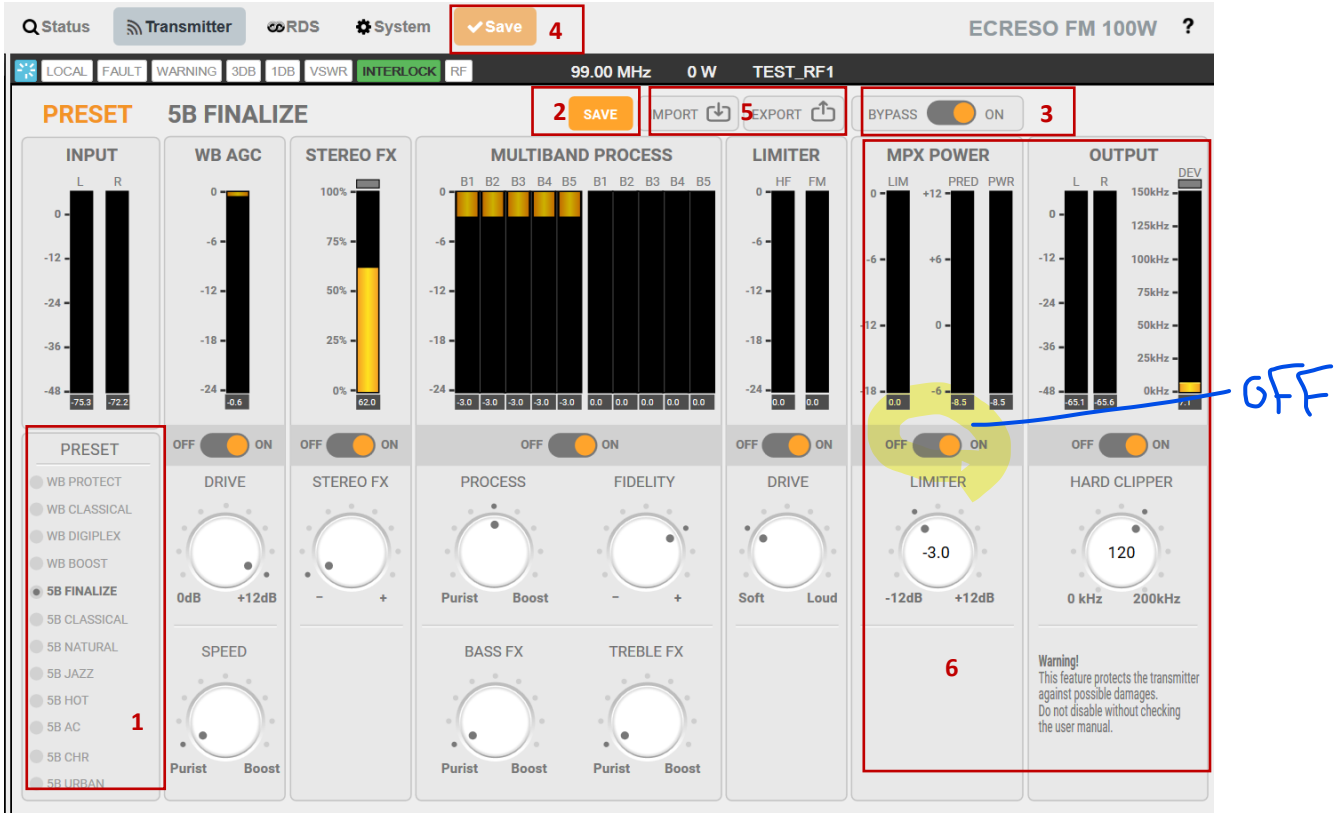
10.3. Management using the web interface

The sound processor settings are available on the Transmitter/Modulation/Sound Processor page of the embedded web site.



To select a preset, simply click on its name in the list **(1)**. The selected preset is automatically applied.

When the 5-band Sound process license is present, if parameters are greyed out, make sure the processor is enabled, and not on bypass **(3)**. Once the processor is enabled (ON), click the Save button in the main toolbar **(4)**. The parameters are now available.

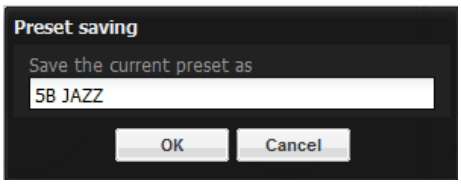
To modify parameters, turn the various buttons: click on the dot corresponding to the value you want to set, or use the scroll wheel when the mouse is over the button.

Some presets include specific or set algorithms or functions. In that case, a lock is displayed in the parameter to indicate it cannot be modified.

10.3.1. Saving a preset

When preset parameters are modified, the effects are immediate. However, to store the modified preset you need to save it, using the button in the sound processing toolbar **(2)**.

Upon saving, you may change the name of the preset in the pop-up window. The new preset will then replace the previous one in the list.



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10.3.2. Import/Export

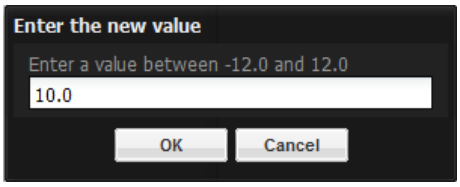
To apply a modified preset on a different ECRESO FM transmitter, export and import it using buttons in the sound process toolbar **(5)**.

When exporting, a .sp file including all parameters for the current preset is created and saved locally or on the network. This file can then be imported into another transmitter.

Factory presets can be downloaded on the WorldCast Systems website to be reimported if needed.

10.3.3. Transmitter settings

Note that the MPX power limiter and hard clipper are transmitter parameters **(6)**, they are set for the whole transmitter, not for individual sound processing presets (see section 5.15 for more information).



To enable/disable them, slide the corresponding ON/OFF buttons.

To adjust their values, you may either click on the dots like with other buttons, or click on the button to open a pop-up windows and enter a specific value.

Click the Save button in the main toolbar **(4)** after modifying MPX power limiter and hard clipper settings.

The displayed output level does not take into account the hard clipper.

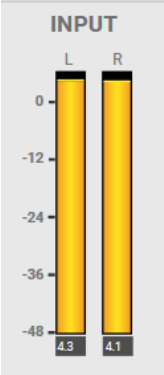
10.4. Sound process parameters

BYPASS

Unlike several other FM processors, the bypass is not a preset, but a real bypass feature that roots the signal directly to the output without going through the sound processor algorithms.

The MPX Power Limiter and the final Hard Clipper are not affected by this BYPASS but only by their own ON/OFF buttons.

INPUT STAGE



The first vu-meters indicate the audio levels (left and right) at the input of the processor. The units are in dBr, relative to the input level setting of the current audio source. For example, if you feed the analog audio input of the transmitter with a +12 dBu signal and if you configure the corresponding input level setting to 12 dBu as well (see section 5.6), the vu-meter will indicate 0 dBr. Be aware that you may see different results if you add gain to your signal before the processor, in the input settings page: right trim, drive or pre-emphasis.

In general, the processor will operate at its best when the peak meter indicates 0 dBr. Obviously this must be observed while the studio is playing a typical content. If it is a soft musical part, it is better to wait until the content changes. Don't hesitate to observe during several minutes. If the peak meter is too low or too high, adjust your input level setting (see section 5.6).

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AGC

The automatic gain control softly regulates the audio level thanks to predictive algorithms, in order to be clean and unnoticeable for the human ear. It also includes a noise gating algorithm to avoid increasing the level in case of silence.

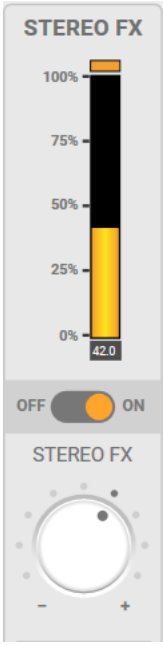
The vu-meter shows the attenuation in dBr performed by the AGC stage after its drive. When the gating is activated and the AGC frozen, the vu-meter turns black. You can easily see it if you feed the transmitter with a high level (AGC attenuation clearly visible on the vu-meter) quickly followed by a silence. Note that the gate operates in different ways depending on the original preset you have selected.

The ON/OFF button allows enabling or disabling the AGC algorithm. It is recommended to always keep it on, which is the case even in the WB PROTECT and 5B FINALIZE presets to avoid audible distortion in case of wrong input level.

The DRIVE setting is a fixed gain applied at the input of the AGC. It sets the range in which your AGC will work. Configure it to 0 dB to compensate high levels only: the AGC stage will work as a soft protection but it may result in a loss of loudness. Increase the drive setting to also compensate low audio levels, which is recommended in most cases. The set value represents the maximum gain the AGC will be able to apply to your program.

The SPEED setting can be used to configure a slow or fast gain control. Decrease the parameter for purist formats or increase it (Boost) for commercial formats. You should see a real time impact on the AGC vu-meter especially if you play a punchy number followed by a softer piece. With a slow AGC, the soft piece will need some time to be compensated and you will see the AGC releasing the gain very slowly. On the contrary, with a faster configuration, the AGC compensates the soft content piece as soon as possible.

STEREO EFFECT (only available with the Sound processing option)



The Stereo FX section controls the stereo of your signal. It is fully compatible with mono contents; no stereo will be generated by the algorithm if there is none at all on your audio source. When feeding the transmitter with stereo content, two algorithms are applied: stereo enhancement and stereo limitation. The stereo enhancer slightly increases the stereo effect. The stereo limiter ensures a proper balance between mono and stereo components to avoid reception issues on difficult coverage areas. If you feed the transmitter with an “extreme” signal full of stereo (without mono component), the limiter will put back some mono to your broadcasted signal.

The vu-meter shows the quantity of stereo (in %) on the broadcasted signal. 0% means the current signal is mono while a 100% value would mean both L+R and L-R have the same level. The LED on the top of the vu-meter indicates the activity of the stereo limiter.

The ON/OFF button enables or disables the Stereo FX algorithm.

The STEREO FX parameter sets how much stereo will be added to the program. The minimum value will not change much the audio source but the limiter will be enabled, while high values will also increase the stereo image.

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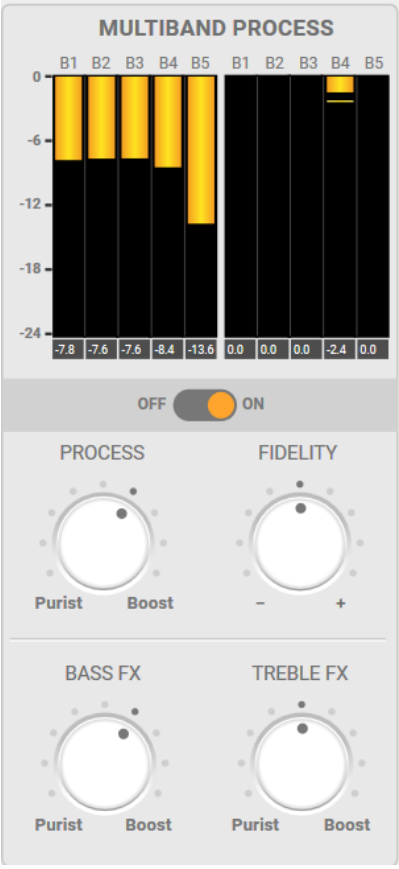
MULTIBAND PROCESS (only available with the Sound processing option)



The multiband process includes several stages: bass and treble enhancers, equalization, 5-band processing, 5-band limiters and a mixer that recombines the audio.

The first 5 vu-meters show the activity of the 5-band processor. Each vu-meter represents the attenuation in dBr performed by each band from low to high frequencies. Depending on presets, the 5-band processor stage includes an intelligent gating feature visible when the vu-meter turns black. The 5 other vu-meters indicate the peak control performed by the 5-band limiters. They are used to perform faster and with less attenuation than the previous ones but it depends on the preset and on the program material.

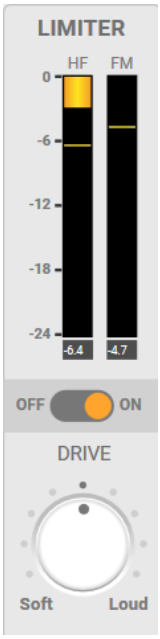
The ON/OFF button enables or disables the multiband process stage.

The PROCESS knob is an intelligent setting that acts on several gains within the processing chain to provide a more or less processed sound. Reduce the value to “purist” for a natural sound but most likely less presence. Increase the parameter to “boost” for more multiband processing and increased loudness.

The FIDELITY setting defines how the audio spectrum can or cannot be affected by the processor. High values lead to a very natural and purist sound where the bands will also be linked together to keep the original audio spectrum. Lowest values allow the processor to provide a stronger sonic signature among distinct program materials, and it also leads to slight loudness increase.

The BASS and TREBLE settings allow increasing low and/or high frequencies. Setting them to the minimum value will result in a totally transparent sound (neither equalization nor enhancers applied). Increasing the settings will result in a more colorful sound. Note that the way the equalizers and enhancers perform, also depends on your original factory preset.

FINAL LIMITERS



This stage limits the audio to a maximum peak value to prevent the deviation to exceed your setting. It also increases the loudness (depending on presets and settings) without audible distortion. It is a very fast and powerful stage with HF and FM Limiters. The HF Limiter is dedicated to trebles while the FM Limiter covers the whole audio bandwidth.

Each vu-meter shows the peak control performed by each limiter.

The ON/OFF button enables or disables the Final Limiters stage. It is recommended to always keep this stage ON.

The DRIVE setting controls the gain applied at this stage. Configure it to the minimum for soft and very purist formats. Increase the parameter step by step if you want to get more loudness.

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11. REMOTE CONTROL AND MONITORING WITH THE GPIO BOARD

11.1. Introduction

This function is available when the optional standard or analog GPIO board is installed on the transmitter.

It provides an interface between ECRESO transmitters and external systems. The modules are remotely controlled via “RC” inputs using opto isolators. Working state and alarms are sent to “RM” outputs via relays, or “RM ANA” analog outputs on the analog board.

11.2. Standard GPIO board

11.2.1. Description of control and monitoring functions

Control commands work when an impulsion longer than 100 ms is sent to the corresponding input.

There are eight control functions:

- Power on: turns on the transmitter
- Power off: turns off the transmitter
- RF on: enables the RF
- RF off: disables the RF
- TA on: enables the TA (basic RDS)
- TA off: disables the TA (basic RDS)
- DSN main: enables the main DSN (basic RDS)
- DSN alt: enables the alternative DSN (basic RDS)

Control commands can also be used to trigger presets. See section 9.4.2 for more details.

Outputs are relays that include a normally closed or normally open contact. When an event occurs in the unit, the corresponding relay is activated.

Seven monitoring functions are associated with relays:

- Local: indicates if the unit is in local mode
- Fault: indicates a transmitter fault
- Warning: indicates an alarm linked to the internal working of the transmitter (temperature, voltage…)
- RF: indicates if the RF is enabled
- On: indicates if the transmitter is not in standby mode
- Off: indicates if the transmitter is in standby mode
- VSWR: indicates if there is a VSWR error

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11.2.2. Remote control function pinout

Function	Remote Control	Input name	Common
POWER ON / PRESET 1*	RC1	OPT1A(20)	RC_COMMUN(24)
POWER OFF / PRESET 2*	RC2	OPT2A(8)	RC_COMMUN(24)
RF ON / PRESET 3*	RC3	CONF1(21)	RC_COMMUN(24)
RF OFF / PRESET 4*	RC4	CONF2(9)	RC_COMMUN(24)
TA ON / PRESET 5 or 1*	RC5	CONF3(22)	RC_COMMUN(24)
TA OFF / PRESET 6 or 2*	RC6	CONF4(10)	RC_COMMUN(24)
DSN MAIN / PRESET 7 or 3*	RC7	CONF5(23)	RC_COMMUN(24)
DSN ALT / PRESET 8 or 4*	RC8	CONF6(11)	RC_COMMUN(24)

Numbers in parenthesis indicated the pin number on the DB25 connector.

* The GPIO board can be used to manage presets. See section 9.4.2 for more détails.

11.2.3. Remote monitoring function pinout

Event	Remote Monitoring	Output name	Common
LOCAL	RM1	REL1_RT(1)	REL1_C(14)
FAULT	RM2	REL2_RT(2)	REL2_C(15)
WARNING	RM3	REL3_RT(3)	REL3_C(16)
RF (ON/OFF)	RM4	REL4_RT(4)	REL4_C(17)
ON	RM5	REL5_T(18)	REL5_C(6)
OFF	RM6	REL5_R(5)	REL5_C(6)
VSWR	RM7	REL6_RT(19)	REL6_C(7)

Numbers in parenthesis indicated the pin number on the DB25 connector.

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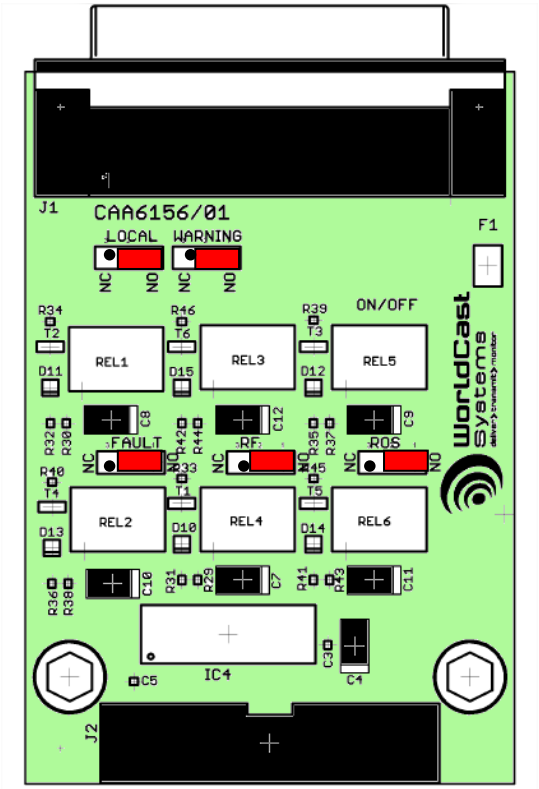
A closed link indicates valid information when configuration is as in the following table.

Default jumper position:

Relay	Positions	Contacts
REL_1RT	JUMP2[1 ;2]	NO
REL2_RT	JUMP3[1 ;2]	NO
REL3_RT	JUMP5[1 ;2]	NO
REL4_RT	JUMP1[1 ;2]	NO
REL6_RT	JUMP4[1 ;2]	NO

Jumpers from 1 to 5 (JUMP1 to JUMP5): select the NO or NC contact of the relays.



All jumpers are normally open on the GPIO board.

Switching to local mode (relay 1) prevents remote control: it therefore disables all other relays and commands.

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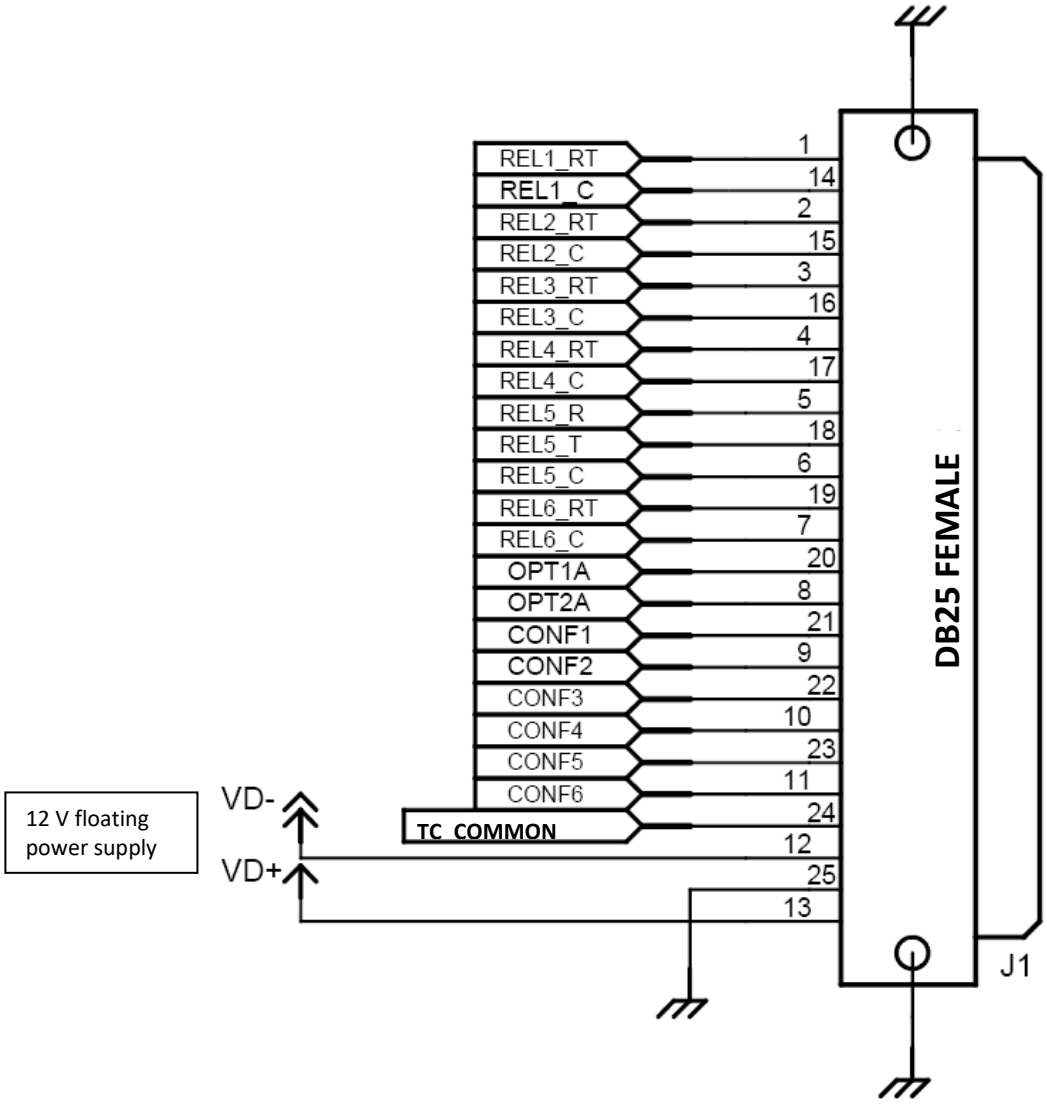
11.2.4. Physical representation of the GPIOs



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11.2.5. Management using serial commands

A set of commands makes it possible to override the control board to modify specific RM outputs and read specific RC inputs.

To do so, set the RC you want to control (SYS.GPIO.IN.MASK) and the RM you want information from (SYS.GPIO.OUT.MASK).

When these commands are used, the control board cannot monitor nor control them.

NAME	Access (R/W)	Serial port possible value	Comments
SYS.GPIO.IN.ACT	R	XX X=[A..F;0..9]	Indicates the corresponding RC when assigned to an external unit.
SYS.GPIO.IN.MASK	R/W	XX X=[A..F;0..9]	Sets the RC control either by the control board or by an external unit (IP board). Hexadecimal code: each bit corresponds to an input. Ex: A1 (10100001) indicates the RC 1, 6 and 8 are assigned to the IP board.
SYS.GPIO.OUT.ACT	R/W	XX X=[A..F;0..9]	Enables the corresponding RM when controlled by an external unit.
SYS.GPIO.OUT.MASK	R/W	XX X=[A..F;0..9]	Sets the RM control either by the control board or by an external unit (IP board). Hexadecimal code: each bit corresponds to an input: Ex: 21 (00100001) indicates RM 1 and 6 are controlled by the IP board.

Serial commands used to configure RC/RM

Remote control binary values:

Remote Control	Binary value
RC1	xxxxxxx1
RC2	xxxxxx1x
RC3	xxxxx1xx
RC4	xxxx1xxx
RC5	xxx1xxxx
RC6	xx1xxxxx
RC7	x1xxxxxx
RC8	1xxxxxxx

Remote monitoring binary values:

Remote Monitoring	Binary value
RM1	xxxxxxx1
RM2	xxxxxx1x
RM3	xxxxx1xx
RM4	xxxx1xxx
RM5	xxx1xxxx

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RM6	xx1xxxxx
RM7	x1xxxxxx

However, the format of values returned by serial commands is hexadecimal.

You must then convert each 4 digit set as per the following table:

Hexadecimal	Binary
0	0000
1	0001
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001
A	1010
B	1011
C	1100
D	1101
E	1110
F	1111

Examples:

If the command

```
SYS.GPIO.IN.ACT
```

returns

```
8A
```

You must convert the hexadecimal value in binary, ie 8A=10001010, which indicates that RC 2, 4 and 8 are activated.

To control RM 3 and 5, convert the binary value 00010100: you get 14 as per the above table. You must then send the command:

```
SYS.GPIO.OUT.MASK=14
```

11.3. Analog GPIO board

11.3.1. Description of control and monitoring functions

Its working principle is similar to that of the standard board.

On this board, there are four control functions:

- Power on: turns on the transmitter
- Power off: turns off the transmitter
- RF on: enables the RF
- RF off: disables the RF

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Four analog monitoring functions

- Forward power
- Reflected power
- 2 user-defined functions that can monitor one of the following:
    - Ambient temperature
    - Heatsink temperature
    - Fan 1 speed (or fan 2)
    - Amplifier voltage
    - Amplifier current
    - Amplifier power

And seven monitoring functions are associated with relays:

- Local: indicates if the unit is in local mode
- Fault: indicates a transmitter fault
- Warning: indicates an alarm linked to the internal working of the transmitter (temperature, voltage…)
- RF: indicates if the RF is enabled
- On: indicates if the transmitter is not in standby mode
- Off: indicates if the transmitter is in standby mode
- VSWR: indicates if there is a VSWR error

11.3.2. Remote control function pinout

Function	Remote Control	Input name	Common
POWER ON / PRESET 1*	RC1	OPT1(20)	RC_COMMUN(24)
POWER OFF / PRESET 2*	RC2	OPT2(8)	RC_COMMUN(24)
RF ON / PRESET 3*	RC3	OPT3(21)	RC_COMMUN(24)
RF OFF / PRESET 4*	RC4	OPT4(9)	RC_COMMUN(24)

Numbers in parenthesis indicated the pin number on the DB25 connector.

* The GPIO board can be used to manage presets. See section 9.4.2 for more détails.

11.3.3. Remote analog monitoring function pinout

Event	Remote Monitoring	Output name	Common
FORWARD POWER	RM ANA 1	ANA_OUT_A(11)	GND(25)
REFLECTED POWER	RM ANA 2	ANA_OUT_ B(23)	GND(25)
CONFIGURABLE* 1	RM ANA 3	ANA_OUT_ C(10)	GND(25)
CONFIGURABLE* 2	RM ANA 4	ANA_OUT_ D(22)	GND(25)

Numbers in parenthesis indicated the pin number on the DB25 connector.

* CONFIGURABLE: T AMB or FAN 1 or V1+V2/2 or HEAT SINK or FAN 2 or I1+I2

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11.3.4. Remote monitoring function pinout (relays)

Event	Remote Monitoring	Output name	Common
LOCAL	RM1	REL1_RT(1)	REL1_C(14)
FAULT	RM2	REL2_RT(2)	REL2_C(15)
WARNING	RM3	REL3_RT(3)	REL3_C(16)
RF (ON/OFF)	RM4	REL4_RT(4)	REL4_C(17)
ON	RM5	REL5_T(18)	REL5_C(6)
OFF	RM6	REL5_R(5)	REL5_C(6)
VSWR	RM7	REL6_RT(19)	REL6_C(7)

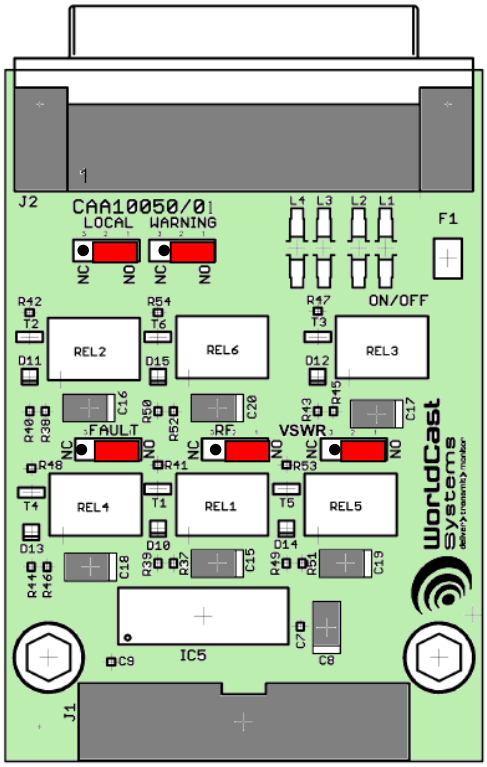
Numbers in parenthesis indicated the pin number on the DB25 connector.

A closed link indicates valid information when configuration is as in the following table.

Default jumper position:

Relay	Positions	Contacts
REL_1RT	JUMP2[1 ;2]	NO
REL2_RT	JUMP3[1 ;2]	NO
REL3_RT	JUMP5[1 ;2]	NO
REL4_RT	JUMP1[1 ;2]	NO
REL6_RT	JUMP4[1 ;2]	NO

Jumpers from 1 to 5 (JUMP1 to JUMP5): select the NO or NC contact of the relays.



All jumpers are normally open on the analog GPIO board.

Switching to local mode (relay 1) prevents remote control: it therefore disables all other relays and commands.

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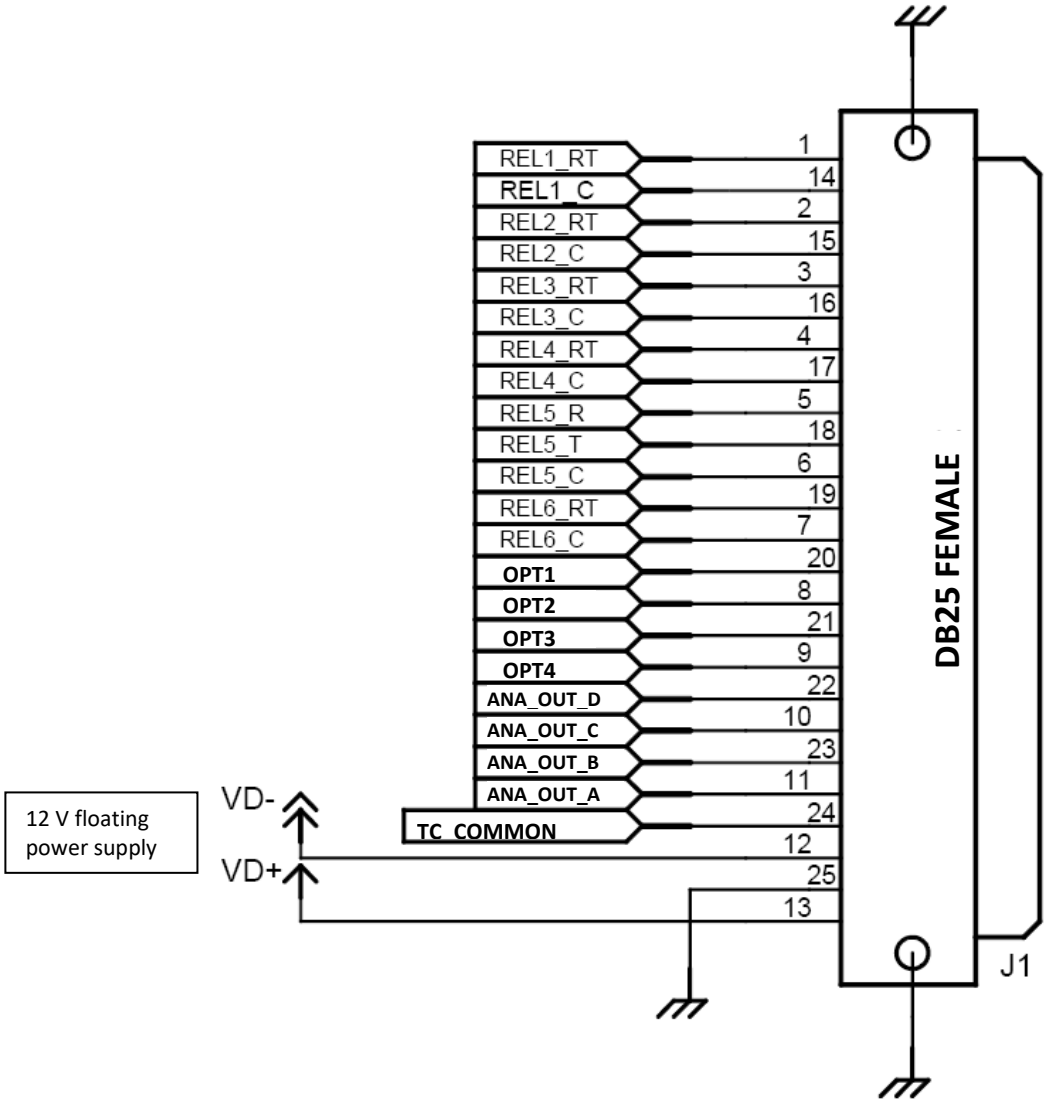
11.3.5. Physical representation of the analog GPIOs



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11.3.6. Management using serial commands

To configure one of the analog functions, simply associate the desired function to one of the configurable outputs:

NAME	Access (R/W)	Serial port possible value	Comments
SYS.GPIO.CONF1	R/W	"AMB" or "FAN1" or "VOLT" or "HEAT" or "FAN2" or "CURRENT" or "PWR"	Sets the remote monitoring ANA3 on the optional GPIO Analog board
SYS.GPIO.CONF2	R/W	"AMB" or "FAN1" or "VOLT" or "HEAT" or "FAN2" or "CURRENT" or "PWR"	Sets the remote monitoring ANA4 on the optional GPIO Analog board

11.3.7. Specification of the analog GPIO board

The values the board can return depend on the power of the module (Ecreso FM or Ecreso FM amplifier):

Module power / Max Value **	100 W	300 W	750 W	1000 W	1500 W	2000 W	3000 W*	3500 W*	5000 W*	5 kW	10 kW
Forward Power (W)	110	330	825	1100	1650	2200	3100	4100	6100	6000	12000
Reflected Power (W)	20	50	50	50	100	100	200	200	300	300	600
Ambient temperature (°C)	70	70	70	70	70	70	70	70	70	70	70
Fan speed (rpm)	19000	19000	6000	6000	6000	6000	19000	19000	19000	10000	10000
Voltage 1+Voltage 2 (V)	60	60	60	60	60	60	60	60	60	60	60
Heat (°C)	80	80	80	80	80	80	80	80	80	80	80
Intensity 1+ Intensity 2 (A)	25	25	25	35	60	70	25	25	25	70	70

** For 3000 W, 3500 W and 5000 W modular transmitters, the max forward and reflected power values apply to the whole transmitter, other values apply to the 100 W exciter only.*

*** The output power is between 0 and +5 V; it varies depending on the measured value. It is at 5 V for the maximum values.*

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APPENDIX A: SOFTWARE OPTION MANAGEMENT

A set of options is available for Ecreso FM transmitters. Contact your WorldCast Systems dealer if you wish to install one of them after the initial transmitter purchase.

With the current version, the following software options are available:

- Communication Pack
- Sound Processor *
- SFN (requires specific hardware)
- RDS *
- SmartFM **
- Activation *

* For these options, two types of licenses are available:

- Permanent license: once applied, the function is permanently unlocked
- Temporary license: valid for a given number of days, it will need to be renewed for the function to remain available. The web application displays a warning when there are less than 30 days left before the expiration date. The

** The SmartFM option works on a credit system. The number of credits is set when the order is placed. These credits are debited when the function is being used. The web application displays a warning when the number of credits left corresponds to less than 30 days of use. Time only counts down when the transmitter is on, and is on hold when off.

You will need to retrieve the software activation key from the transmitter and forward to your WorldCast Systems contact. From this activation key a new key will be created which will unblock the desired option. The last step will be to send it to the transmitter.

This activation process can be done using the web application, the front panel, the PC application or serial commands. Follow the selected procedure as described below.

At the end of the procedure, users connected to the embedded web site will have to reload it to display pages related to the new option.

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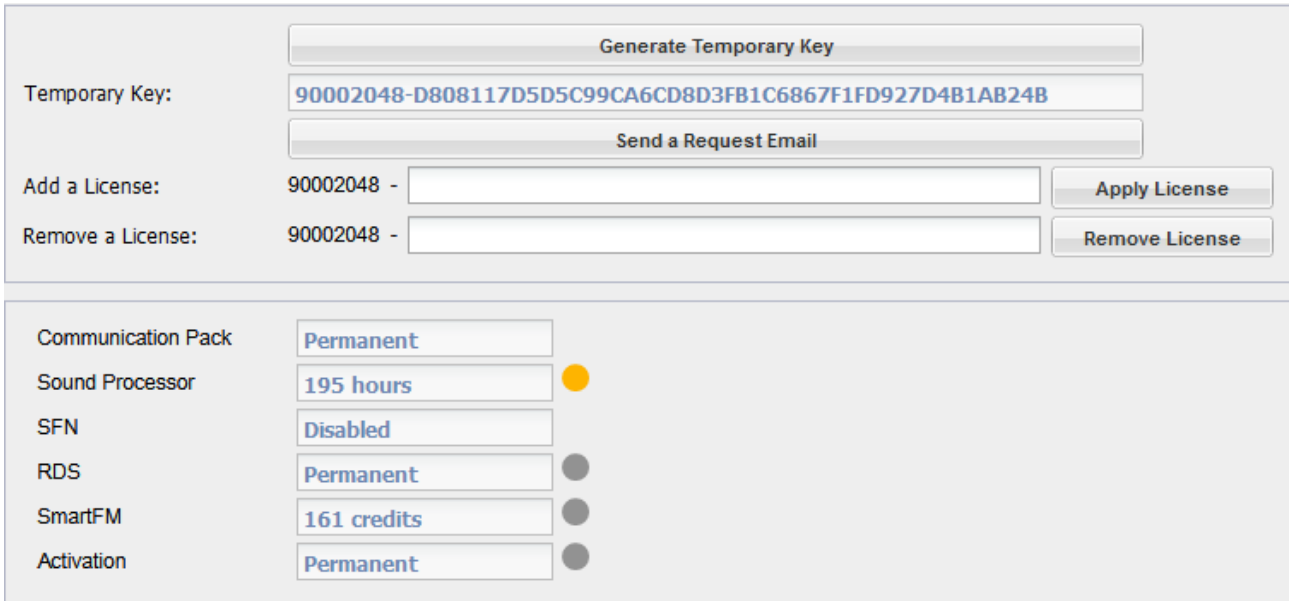
A.1. Using the embedded web site

Display the page **System**/Support/License.



Generate a temporary key and click the button to send by mail to WorldCast Systems.

Enter the new key sent by WorldCast Systems and apply this new license.

Applying or removing a license will disconnect the web interface.

Log in again and check on this page that the desired option is enabled.

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A.2. Using the front panel application

Display the License menu, only visible in Expert mode (first switch to Expert mode if necessary).

```
 98.00MHz      100W
   -> LICENSE >
```

Press the “Enter” button and write down the transmitter’s serial number.

```
1 SERIAL NUMBER
    00000025
```

Press the “+” key until you see this screen.

```
1   ENABLE LIC.
      -> NEW >
```

Press the “Enter” button to access the Enable License sub-menu, then press “Enter” again to generate the key for your transmitter.

```
2 GENERATE KEY
      -> GO
```

Send the serial number and the key to WorldCast Systems.

A new key will be returned to you.

To enter the new key, access the License menu then access the Enable License screen. The ‘Pending’ state indicates the transmitter awaits a new key.

```
1   ENABLE LIC.
      -> PENDING
```

Once you have received the new key, press the “Enter” button to display this screen and press Enter again to switch to edit mode.

Using the “+” and “–” keys, adjust the value for each digit, press “Enter” to go to the next digit.

```
2   ENTER KEY
 -> 0000000000
```

Press the “+” key until you see the Go To screen and select ‘License’ to return to the previous level of menus.

```
1      GO TO
 -> LICENSE  -> ADD.
```

Press the “+” key to access the Current License screen. The new license should now be part of the list.

```
1 CURRENT LICENCE
-> RDS BASIC, PLAYE
```


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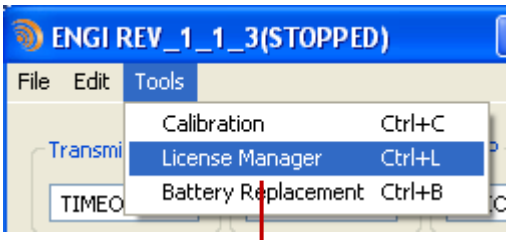
A.3. Using the PC application

License management is only available with Engi version 1.1.1 (or more recent).

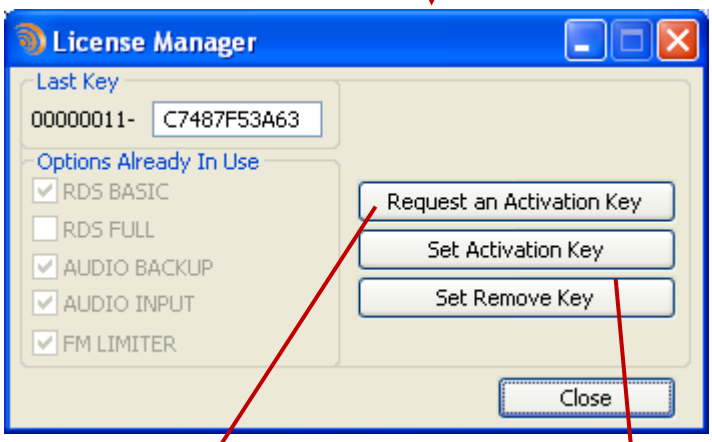
Connect to the transmitter with the Engi application, either with a direct connection or via the network (see chapter 7) and display the Tools/License Manager menu.



! ***If communicating via Telnet, this operation can only be done when the transmitter is in remote mode.***

Click the 'Request an Activation Key' button: a value is generated by the transmitter and copied into the clipboard.

The new activation key must be different from the key displayed when the License Manager window is first opened ("Last Key").

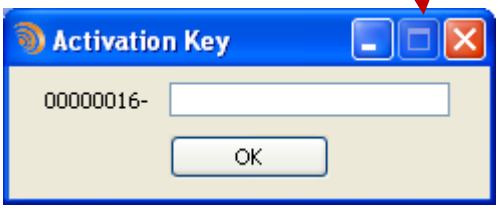


Send this key to WorldCast Systems.

A new key will be returned to you.

Once you have received the new key, display the License Manager again and click on the 'Set Activation Key' button. Copy the new key into this window and click the 'OK' button to enable the license.

The new option is now enabled.



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A.4. Using serial commands

Connect a PC to the front panel serial port as described in chapter 6.

Send the command:

```
SYS.KEY.ADD
```

The return value will have the following format: *serial_number-key1.*

Send this key to WorldCast Systems.

A new key will be returned to you (*serial_number-key2*).

Once you have received the new key, send the command:

`SYS.KEY.ADD=` *serial_number-key2*

The unit will return:

```
$OPTION ACTIVATED
```

If the key is not recognized, the unit will return:

```
WRONG KEY
```

In that case you will need to contact WorldCast Systems.

You can check the current options by sending the command:

```
SYS.OPT.LIST
```

The unit will return the list of enabled options, including the new one.

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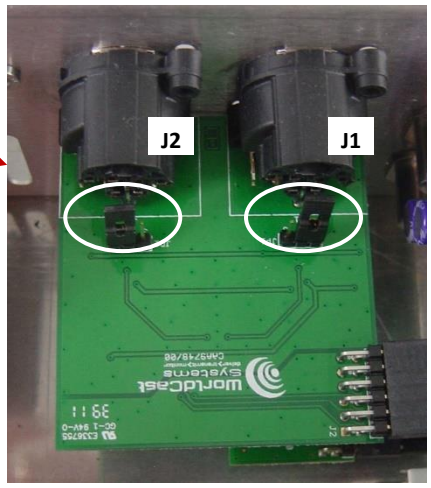
APPENDIX B: ADJUSTING THE IMPEDANCE OF ANALOG INPUTS

Default impedance of analog inputs is high.

It can be set to 600 Ω by jumpers.

Before setting the jumpers, make sure that all cables are disconnected. Remove all the screws securing the cover.



Jumper position on a type II board:

	J2	J1
High impedance	■ ■ ■	■ ■ ■
600 Ω	■ ■ ■	■ ■ ■

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APPENDIX C: EMR

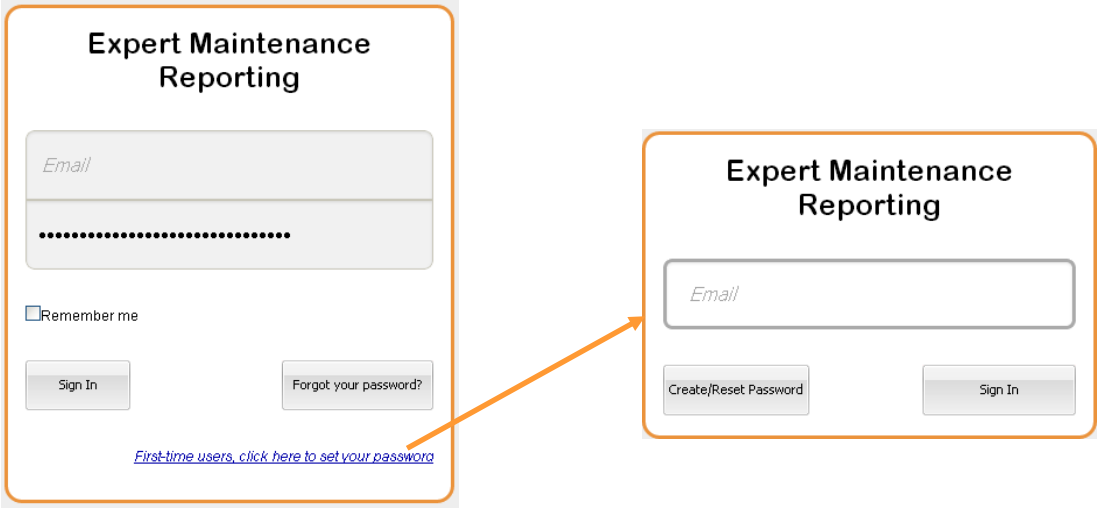
C.1. Setting up

C.1.1. Connecting for the first time to EMR

Open a web browser (Google Chrome, Mozilla Firefox …) and enter the site address: www.expertmaintenance.net in the address bar.

Though the web application is compatible with most browsers, performances vary greatly from on browser to another. For this reason, we recommend you use Google Chrome. You may also use Google Chrome Portable; this version can work without being installed on your PC (it can be on a flash drive).

As a first time user, you will have to set your password before being able to connect.



Click on the “First time user” link.

Enter the email address you provided to WorldCast Systems for your EMR account and click the “Create/Reset Password” button.

You will soon receive an email with instruction on how to create you password. The link given in the email will only be valid for a day.

As soon your new password is created, you will be able to use it to connect to the EMR site using the standard login page.

If you forget your password, follow this same procedure to create a new one.

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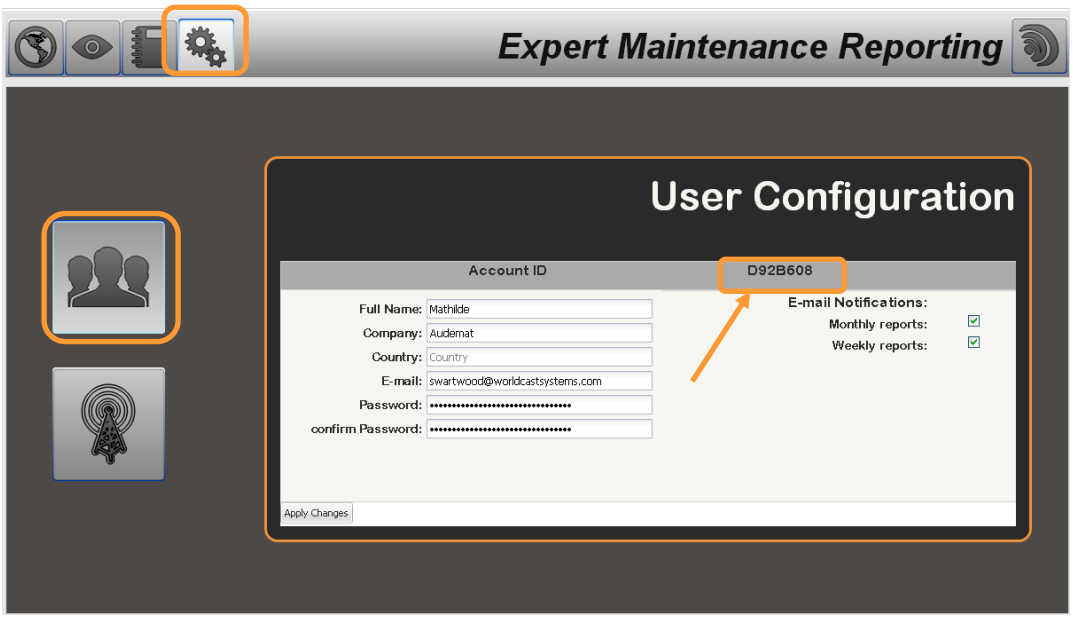
C.1.2. Retrieving your account ID

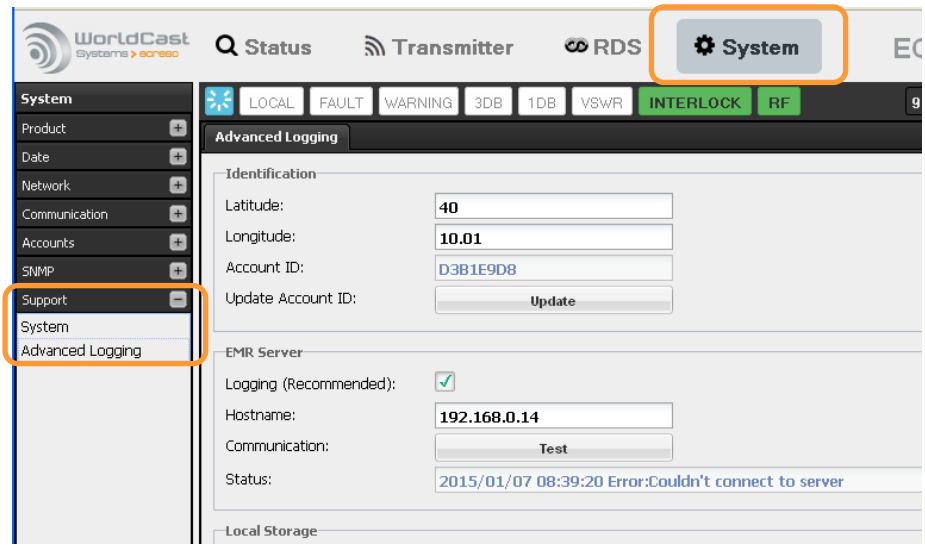
Once connected, display the configuration pages and view your account settings.



Note the account ID; it will be required to set the transmitters.

C.1.3. Setting up transmitters

Connect to the embedded web site of your transmitter and display the System/Support/Advanced Logging page:



Enter its position and your EMR account ID as retrieved above.

Check the 'Logging' box in the EMR Server section to enable EMR.

Enter the IP address of the EMR server (or web address) in the 'Hostname' field, save the configuration and click the Test button to check proper communication between your transmitter and the EMR server.

Repeat this operation with each transmitter that will be monitored.

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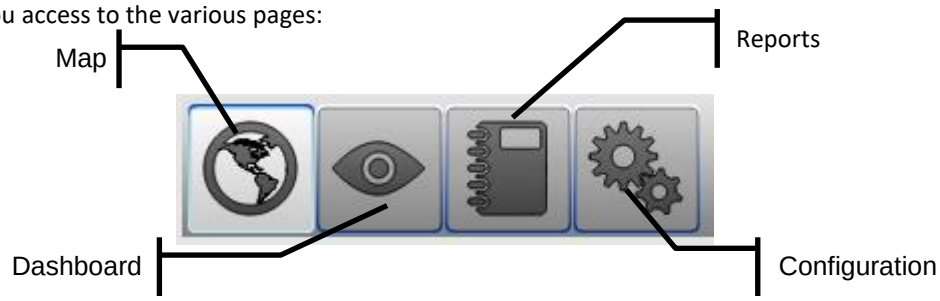
C.2. Using EMR

C.2.1. Preésentation

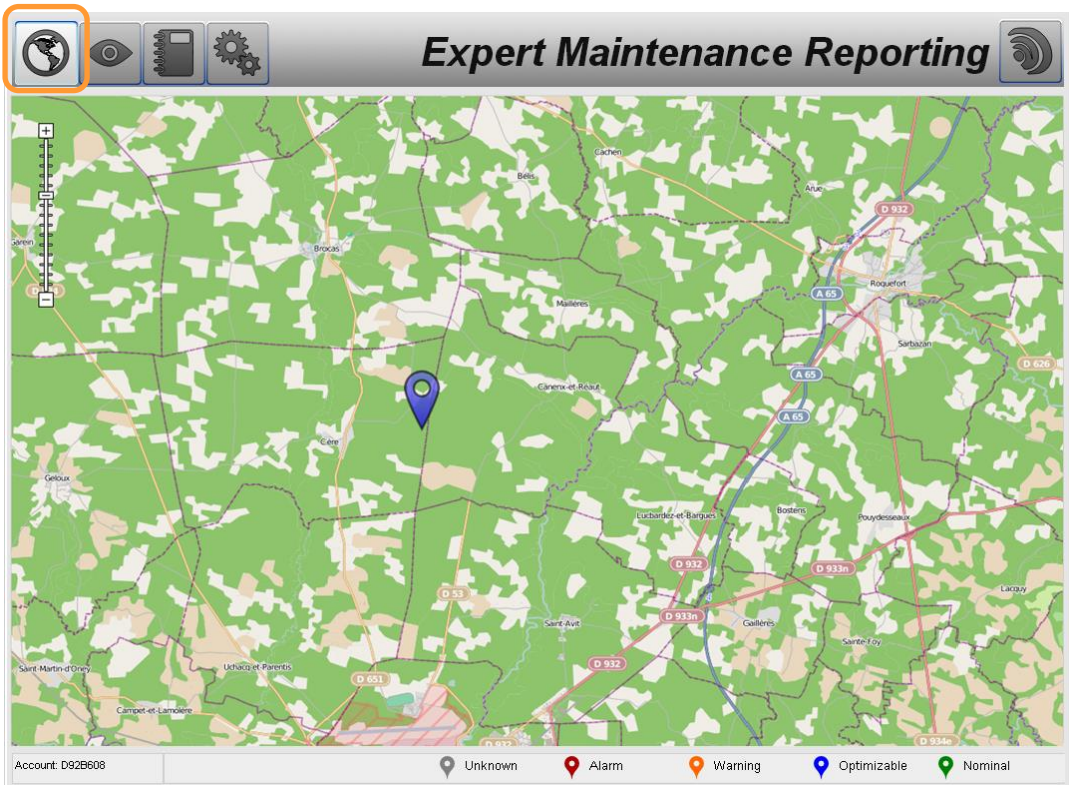
Connect to the EMR site again using your login and password.

A tool bar gives you access to the various pages:



C.2.2. Viewing the map

The map is the first page you see.



The cursor on the top left the map allows changing the zoom level.

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Symbols on the map indicate where transmitters are and what their statuses are:

Transmitter unknown, communication cannot be established

Transmitter with at least one alarm

Transmitter with at least one warning type event

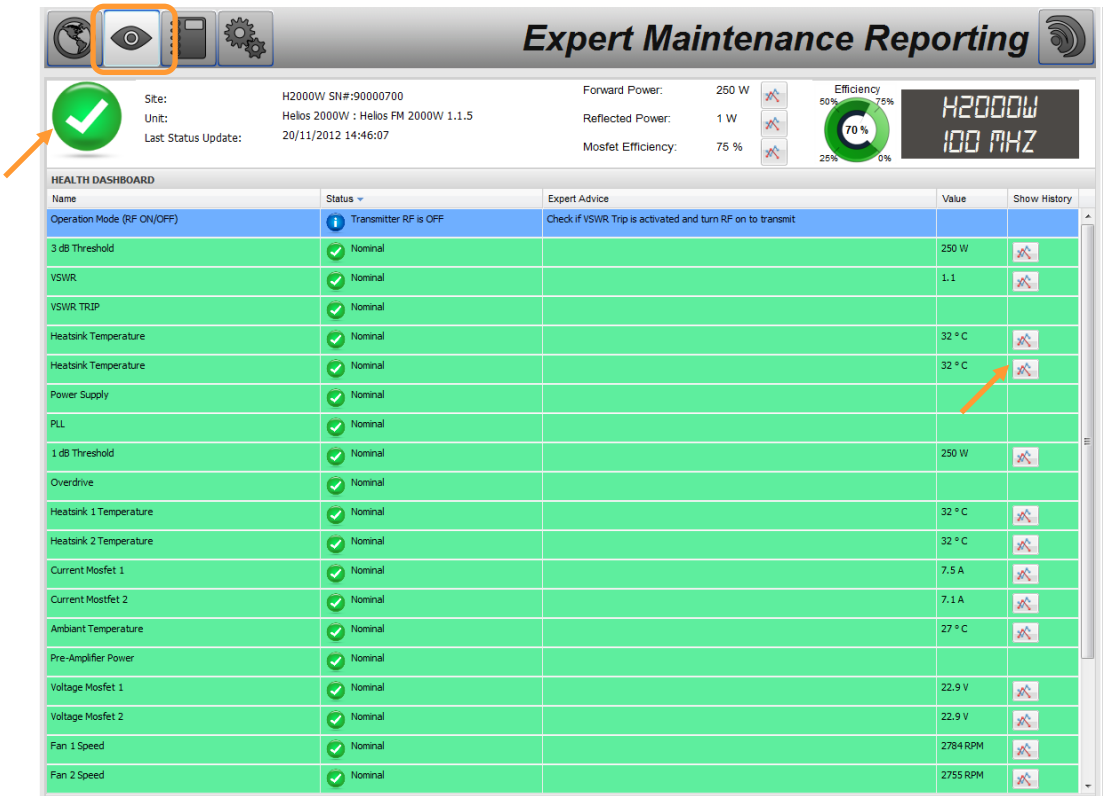
Transmitter could be optimized

Transmitter in nominal state

The status of the transmitter is determined by alarms visible on the Dashboard. In case there several events are occurring at once, the status will be that of the strongest event (Alarm > Warning > Optimizable).

C.2.3. Dashboard

Click on an icon on the map to display the dashboard for the selected transmitter.



In the header of the dashboard, general transmitter information is given along with its status. The status is identical to the map with the following symbols:

Transmitter with at least one alarm

Transmitter with at least one warning type event

Transmitter could be optimized

Transmitter in nominal state

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In the “Expert advice” column, suggestions are given to correct the issue or improve the performance of the transmitter.

The following parameters are also given, within a range depending on the transmitter power:

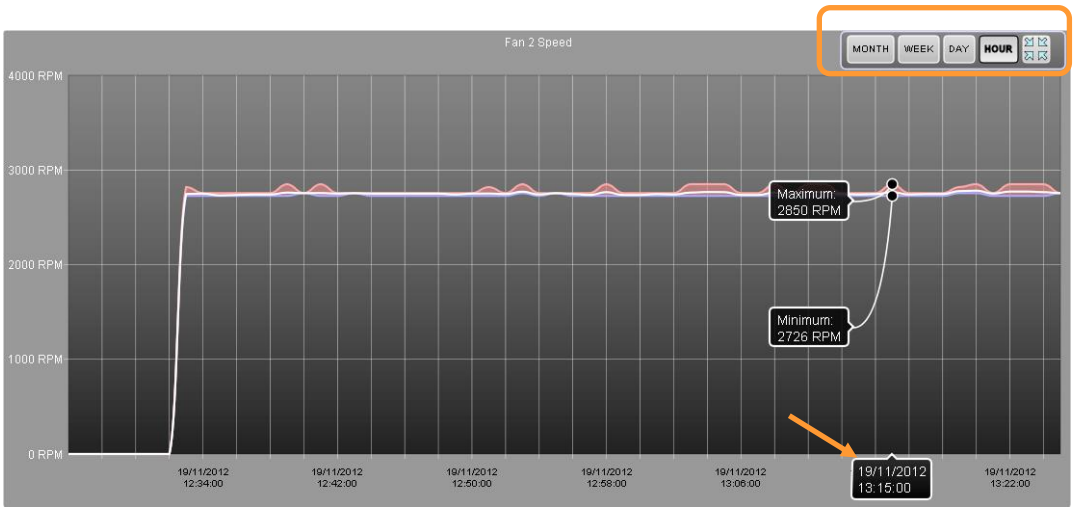
	100 W	300 W	750 W	1000 W	1500 W	2000 W
Forward power *	0 - 120 W	0 - 350 W	0 - 900 W	0 - 1200 W	0 - 1700 W	0 - 2200 W
Reflected power *	0 - 20 W	0 - 50 W	0 - 50 W	0 - 50 W	0 - 100 W	0 - 100 W
Mosfet efficiency *	0 - 100%					
Global efficiency	0 - 100%					

And the following readings:

- Mosfet current
- Mosfet voltage
- Pre-amplifier power
- Ambient temperature
- Heatsink temperature
- Fan speed
- PSU temperature
- Control board temperature
- Modulator temperature
- Atmospheric pressure

To display the time graph corresponding to these four parameters, simply click on the symbols and .

The graph below shows curve data averaged over the past hour, day, week or month, with minimum and maximum values.



When changing the time scale using the hour / day / week / month buttons, the selected time remains centered in the display frame.

You can slide the date tag to display the compound value at a given time.

Return to the main view by clicking .

Curves are refreshed once per hour.

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In the main table, various parameters and alarms are displayed. The list and range of possible values vary depending on the transmitter power:

	100 W	300 W	750 W	1000 W	1500 W	2000 W
1 dB Threshold *	0 – 120 W	0 - 350 W	0 - 900 W	0 - 1200 W	0 - 1700 W	0 - 2200 W
10 MHz switch	X	X	X	X	X	X
3 dB Threshold *	0 – 120 W	0 - 350 W	0 - 900 W	0 - 1200 W	0 - 1700 W	0 - 2200 W
Ambient temperature *	-30 - +70°C	-30 - +70°C	-30 - +70°C	-30 - +70°C	-30 - +70°C	-30 - +70°C
Atmospheric Pressure	600 – 1100 hPa	600 – 1100 hPa	600 – 1100 hPa	600 – 1100 hPa	600 – 1100 hPa	600 – 1100 hPa
Auxiliary Power supply	X	X	X	X	X	X
Control Board Temperature	0 - 100°C	0 - 100°C	0 - 100°C	0 - 100°C	0 - 100°C	0 - 100°C
Current Mosfet 1 *	0 - 25 A	0 - 25 A	0 - 25 A	0 - 35 A	0 - 30 A	0 - 40 A
Current Mosfet 2 *					0 - 30 A	0 - 40 A
Digital Modulator Temperature	0 - 100°C	0 - 100°C	0 - 100°C	0 - 100°C	0 - 100°C	0 - 100°C
Fan1 speed *	0 - 16500 rpm	0 - 16500 rpm	0 - 5000 rpm	0 - 5000 rpm	0 - 6000 rpm	0 - 6000 rpm
Fan2 speed *					0 - 6000 rpm	0 - 6000 rpm
Heatsink Overheat 1 (Alarm Heat) *	0 - 100°C	0 - 100°C	0 - 100°C	0 - 100°C	0 - 100°C	0 - 100°C
Heatsink Overheat 2 (Alarm Heat) *					0 - 100°C	0 - 100°C
Heatsink Temp 1 (Alarm Temp) *	X	0 - 100°C	0 - 100°C	0 - 100°C	0 - 100°C	0 - 100°C
Heatsink Temp 2 (Alarm Temp) *					0 - 100°C	0 - 100°C
Input Switch	X	X	X	X	X	X
Interlock missing	X	X	X	X	X	X
Local mode	X	X	X	X	X	X
Low battery	X	X	X	X	X	X
Operation mode	X	X	X	X	X	X
PLL lock	X	X	X	X	X	X
Power supply	X	X	X	X	X	X
Power Supply Temperature	0 - 100°C	0 - 100°C	0 - 100°C	0 - 100°C	0 - 100°C	0 - 100°C
Pre amplifier Power	0 - 10 W	0 - 10 W	0 - 10 W	0 - 10 W	0 - 15W	0 - 15W
RDS switch	X	X	X	X	X	X
RF not present	X	X	X	X	X	X
SD card logging	X	X	X	X	X	X
Standby	X	X	X	X	X	X
Transmitter Fault	X	X	X	X	X	X
Transmitter Warning	X	X	X	X	X	X
Voltage Mosfet 1 *	0 - 60 V	0 - 60 V	0 - 60 V	0 - 60 V	0 - 60 V	0 - 60 V
Voltage Mosfet 2 *					0 - 60 V	0 - 60 V
VSWR *	1 - 5	1 - 5	1 - 5	1 - 5	1 - 5	1 - 5
VSWR TRIP	X	X	X	X	X	X

All values are given in real time. For parameters followed by a * in the table, values are logged and a time graph can be displayed by clicking the button . These graphs are similar to status bar graphs.

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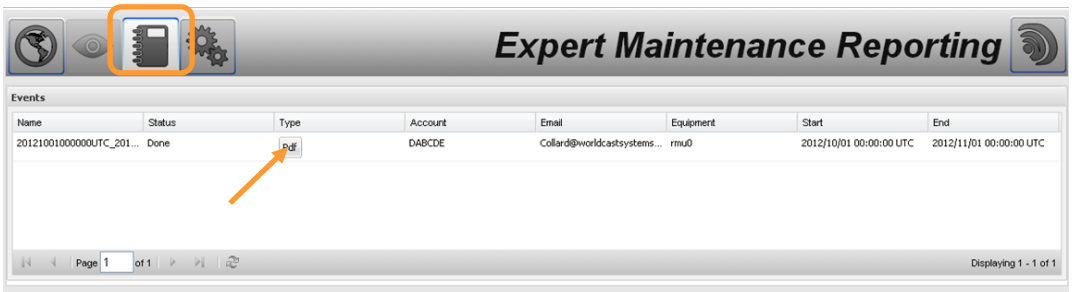
C.2.4. Reporting

The reporting pages list available reports.



The status of the report can be 'in progress' or 'done'. When 'done', it can be downloaded as a pdf file.

It includes the parameters described above and available graphs.

Reports can be automatically emailed (see next section).

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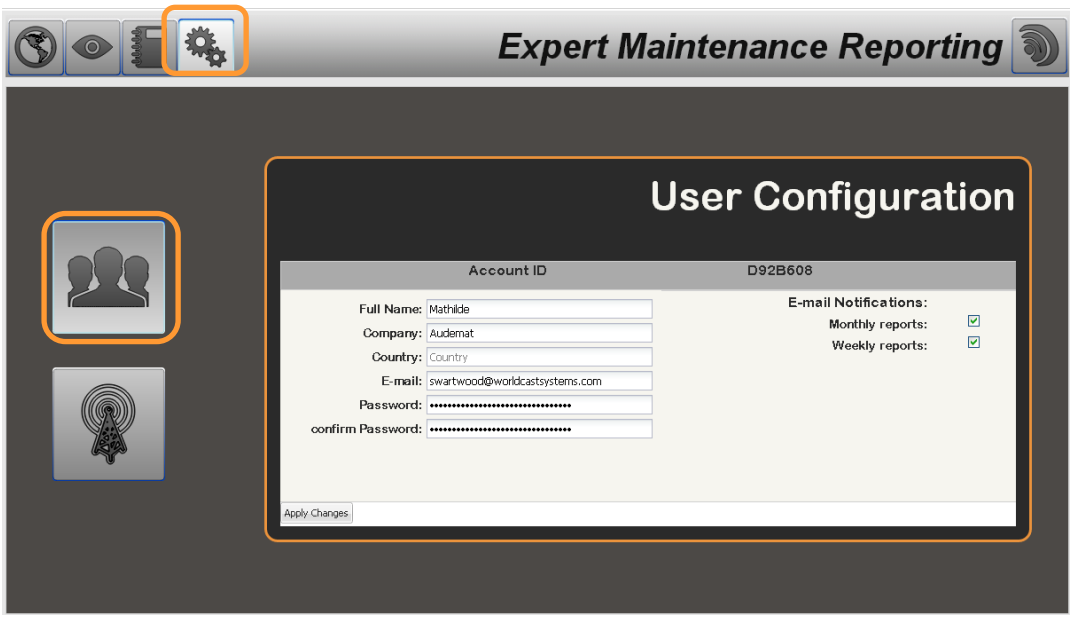
C.2.5. Configuration

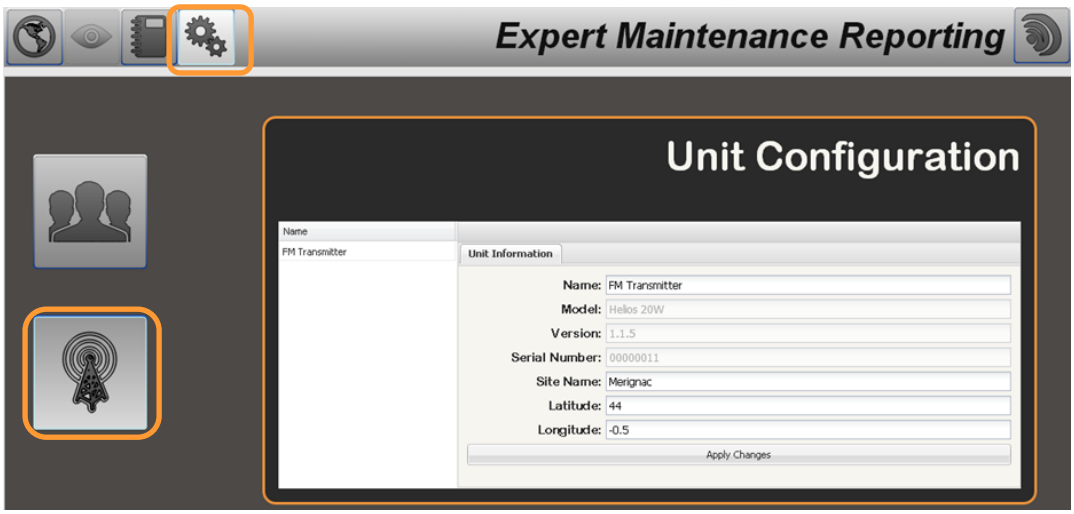
The configuration pages allow you to modify your own account and to set the transmitters.



On the user configuration page, set the notifications you would like to receive by email by checking monthly and/or weekly report. Reports can also be downloaded on the Report page.

Click the “Apply changes” buttons to save your changes.

Click the transmitter button to modify the transmitters associated with your account. Default information is retrieved directly from the transmitters.



Click the “Apply changes” buttons to save your changes.

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APPENDIX D: TROUBLESHOOTING

Problem					Solution
The transmitter is unresponsive. All LEDs are on, INIT.CONFIG / TX.CAP are displayed on the LCD screen. Rebooting has no effect					A factory reset was done on this transmitter, via the ENGI application or with the SYS.RAZ=RAZ command. You must configure the transmitter as needed and exit the menu (see Appendix D2).
I enabled the RF on the transmitter (RF LED ON) but there is no power					
Check whether the transmitter is in alarm	⇨ The transmitter is not in alarm (no red LED)	Check the interlock LED	⇨ The interlock LED if OFF		A short-circuit must be established between both pins of the interlock on the rear panel (green connector).
		Check the power setting	⇨ Power is set to 0 W		Set the desired power (Web Page: Transmitter/Main/Parameters/Power setting). In case of new installation, we recommend starting with low power (10% of nominal power).
	⇨ The transmitter is in alarm (red LED present)	Check the VSWR LED	⇨ The VSWR LED is ON		There is an antenna adaptation issue. Check all the elements after the transmitter: cables, cavity, dummy load, antennas…
			⇨ The VSWR LED is OFF	Check the current on the main PSU	If the current is lesser than 2 A on the main PSU (Web Page Transmitter/Main/Monitoring/Current: **Contact the hotline**
		Check the status of PSU 1 and 2	⇨ One of the PSU is in alarm		Issue with a PSU: **Contact the hotline**

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Problem				Solution
I enabled the RF on the transmitter (RF LED ON), power is OK, but the FAULT LED is ON (and not the 3dB LED)				
Check for the presence of audio	⇨ there is a loss of audio	Check settings for the audio alarm (web page Transmitter/Input Select/Silence Detector)	⇨ The audio alarm is set to trigger a fault type alarm	This behavior is normal. All alarms can be viewed on the front panel Alarms menu.
I enabled the RF on the transmitter (RF LED ON), power is OK, but FAULT and 3 dB LEDs are ON				Check the 3 dB alarm threshold (web page Transmitter/Main/Parameters/3 dB Threshold)
The OK and RF ON buttons on the front panel do not work				These buttons are enabled only in Local mode
The web page is greyed out, there is an orange LOCAL banner on top				Local mode is enabled on the transmitter. You need to disable it via the front panel. You cannot do this operation remotely
A fuse was broken, I changed it, but it immediately blew again.				If you have the surge protector option, it probably has protected the transmitter. Open the equipment and check the surge protector (green LED on the module itself) as well as the mains filter.
I don't care for the language of the Web interface				Display the login page (F5), click on the flag corresponding to the desired language and enter your login information.

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APPENDIX E: MAINTENANCE

! ***For all maintenance operations requiring the chassis to be open, ESD work space and protections are necessary.***

To order spare parts, please contact your WorldCast Systems dealer.

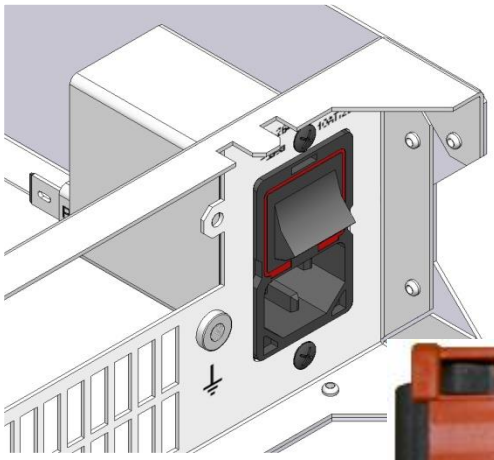
E.1. Changing the fuses

ⓘ *If you need to change the fuses, make sure the surge protector has not been damaged (see section D4).*

ECRESO FM 100W - 1000 W:

Fuse reference: FXE00019

Fuses are located in the power socket on the rear panel.



Insert a flat screwdriver below the red line of the switch, on the left side, and pull lightly outward. The fuse module will come out.

Two 10A fuses are located on top. Remove the defective one.

One spare 10A fuse is located on the bottom. Use it to replace the defective fuse.

Set the module back in place.

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E.2. Changing the battery of the control board

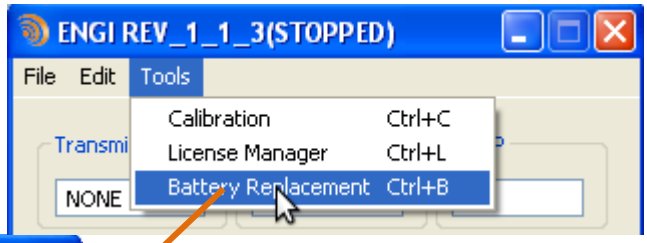
Battery reference: UXE00227

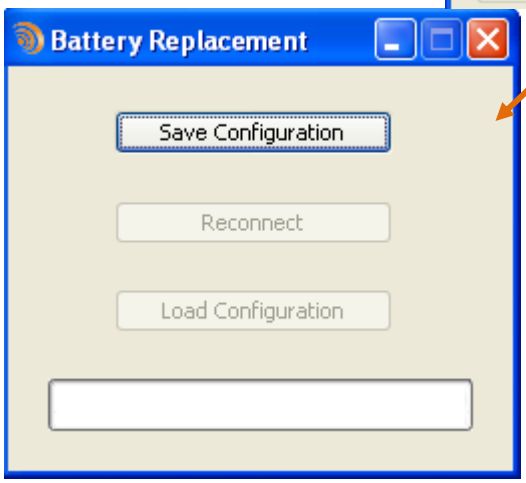
The 'battery low' alarm is triggered when the control board battery needs to be replaced.

Saving the configuration

Before changing the battery, we recommend you save the configuration:

- Connect your module to a PC to be able to use the PC application (see chapter 7).
- Once connected launch the application.
- Open the Battery Replacement window using the Tool/Battery Replacement menu.

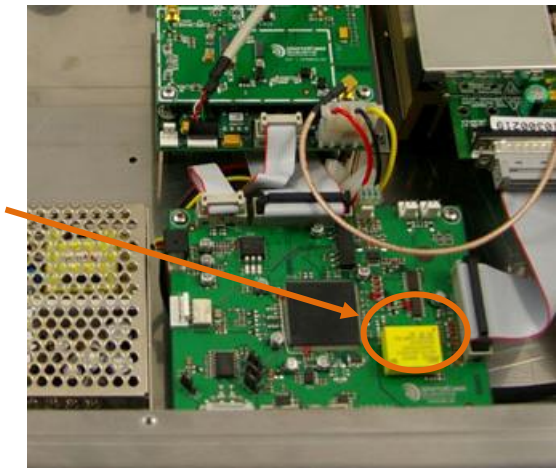




- Click the "Save Configuration" button and wait for the end of the saving procedure.

Changing the battery

- Turn off the unit and disconnect it from the mains.
- Unscrew the top cover and remove it.
- The control board is located on the front of the unit; change its battery.
- Set the cover back in place.
- Reconnect the unit and turn it on.



Loading the configuration

- Connect your module to a PC and launch the PC application as in the first step of this procedure.
- Open the Battery Replacement window using the Tool/Battery Replacement menu.
- Click the "Load Configuration" button and wait for the end of the loading procedure

E.3. Changing the fan

Fan kit references for

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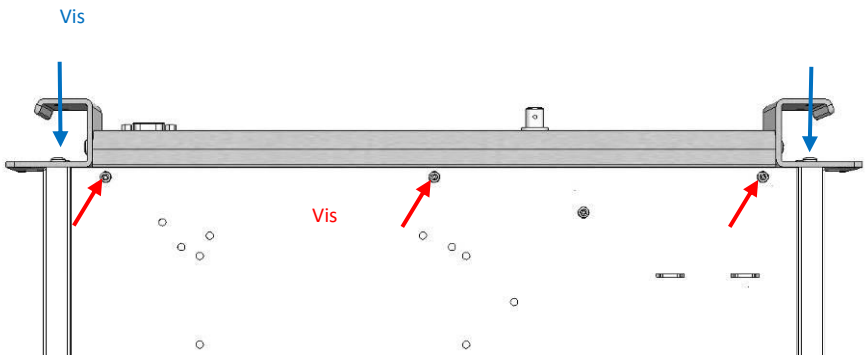
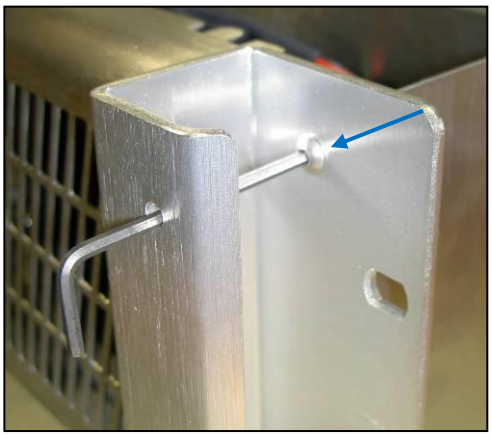
- ECRESO FM 100 and 300W: TFS01013
- ECRESO FM and ECRESO FM Amplifier 750W and 1000W: TFS01014
- ECRESO FM and ECRESO FM Amplifier 1500W and 2000W: TFS01015

The procedure is similar for all modules. With 1500 and 2000 W modules there are two fans side by side.

- Turn off the module needing a new fan and pull it out of the cabinet.
- Unscrew all lid screws and remove the lid.

  In order to make the operation easier, you may also dismount the front panel (3 screws below, 2 on each side)





- Remove the adhesive baseplate (ECRESO FM 100/300W only).
- Disconnect the cable connecting the fan from the control board.
- Unscrew the screws that keep the fan in place on the side and under the frame.
- Pull out the fan block (notches below).
- Take out the fan from its frame by cutting the 4 rubber legs.

- Insert the legs of the new fan using pliers, making sure of the direction they are facing. Make sure the cable does not get stuck.

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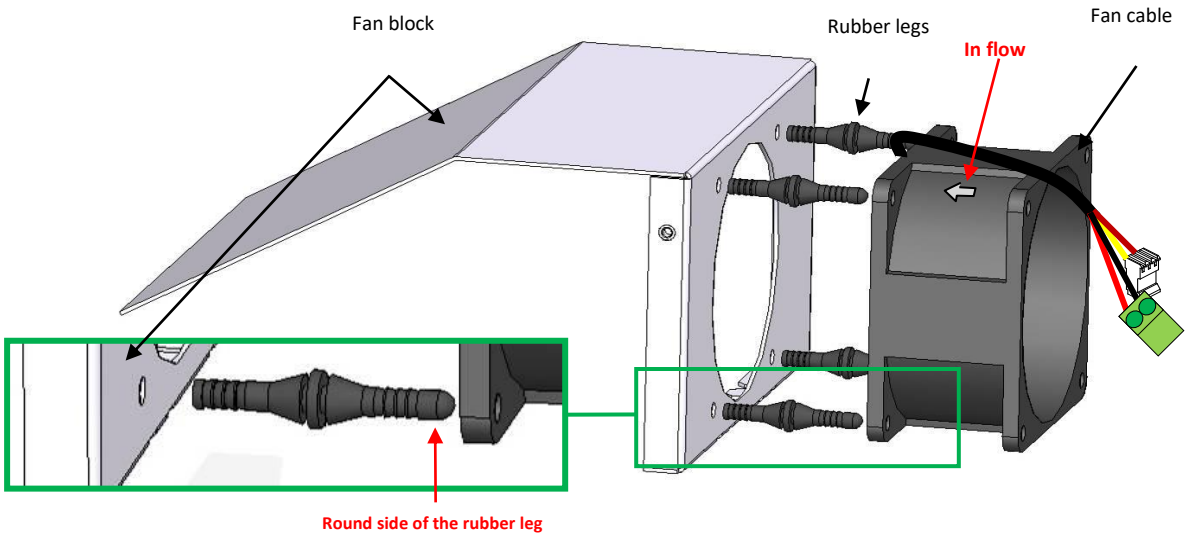

- Place the fan block back in the frame.
- Screw it back with screws under the frame and on the side.
- Connect the fan cable on the control board connector.
- Set the adhesive baseplate (ECRESO FM 100/300W only)
- Mount the front panel and the cover
- Switch on the module to check the fan is OK.

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E.4. Changing the surge protector

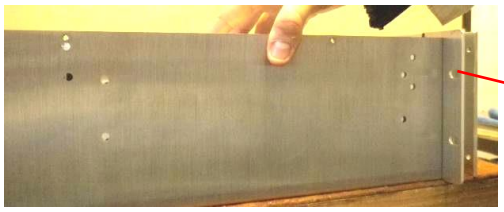
Surge protector reference for ECRESO FM: TFS01034

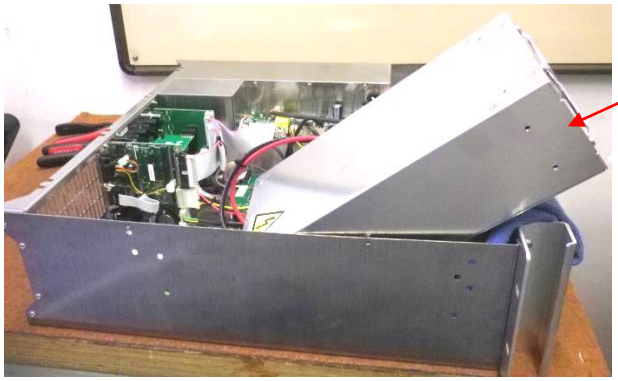
This kit includes:

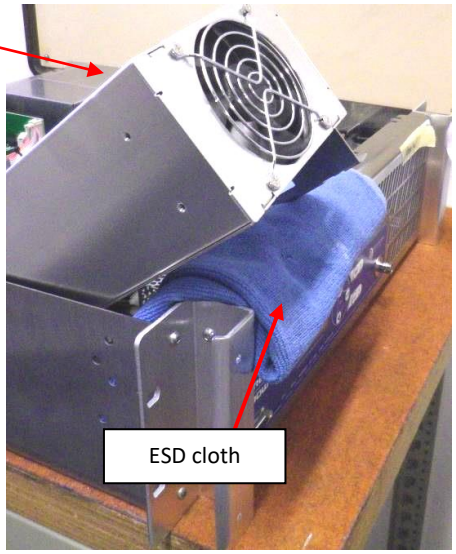
- 1 surge suppressor, type: MSB10-400 with double lugs
- 1 mechanical piece
- 2 TCBC M3x6 screws

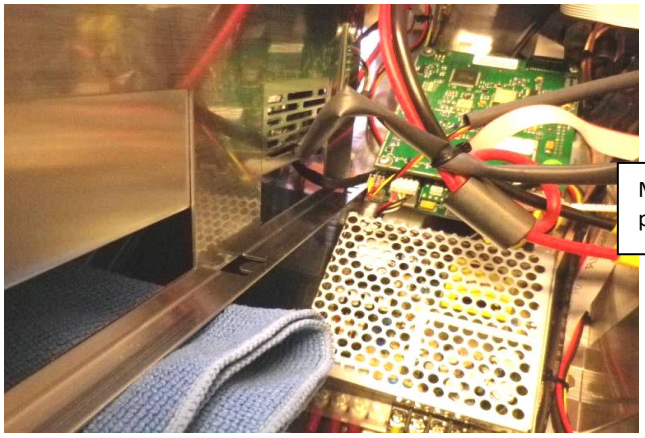
1. Disconnect the unit from the mains.
2. Unscrew and open the lid.
3. Unscrew the screws holding the surge suppressor and disconnect its lugs from the mains filter's lugs.
4. In some cases, it is necessary to extract the power supply for easier operation, as with theEcreso FM 1000W described below.
   - Unscrew the screws holding the power supply to the chassis.
   - Slide it to extract it from the pins
   - Place it on the edge of the front panel, on an ESD cloth to avoid scratching the suface.

! ***Do not disconnect the mains power cables, or pinch them.***









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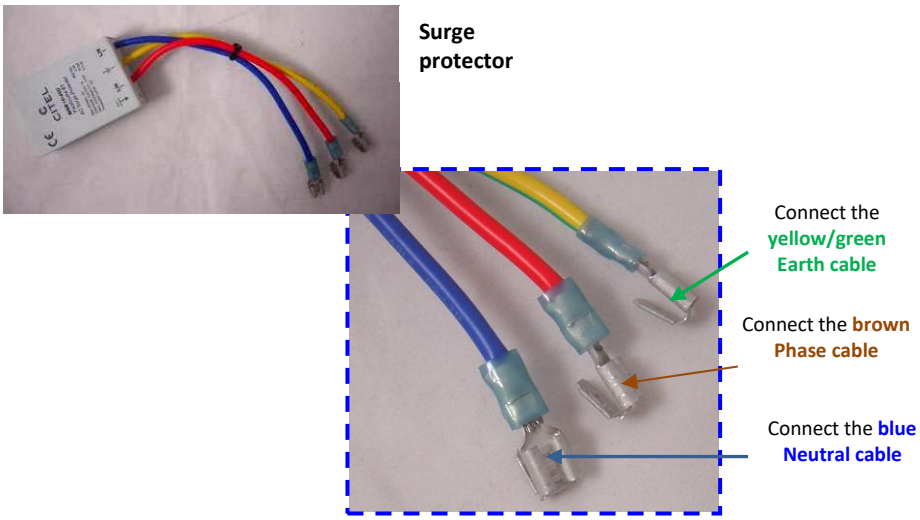
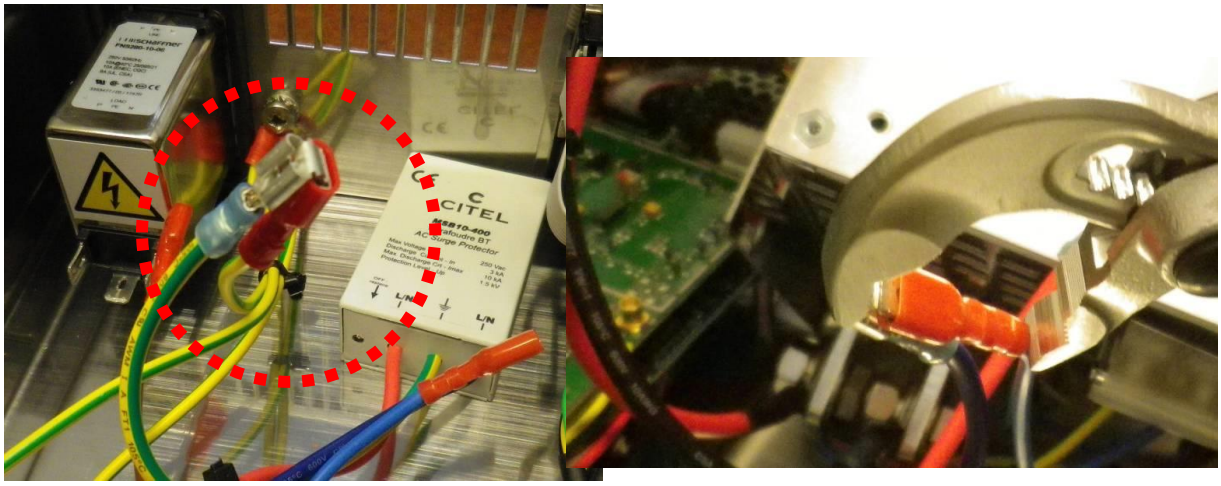
5. Connect the surge suppressor:
   - Connect the Phase cable on the surge suppressor's red-wire double lug
   - Connect the Neutral cable on the surge suppressor's blue wire double lug
   - Connect the Earth cable on the surge suppressor's yelow-green double lug.

! ***If it is difficult to connect, you may use pliers for this operation: the cable must not be pinched, nor the double lug damaged.***





6. Connect the double terminals on the mains filters respecting connections: **Phase**, **Neutral** and **Earth**, (*indications for **phase** (**P**) and **Neutral** (**N**) are present on the side of the 16A circuit breaker.*

! ***Push them all the way, with pliers if necessary.***

ⓘ *On some units, this operation can be slightly hindered by the polycarbonate protection: double-check the lugs are properly installed.*

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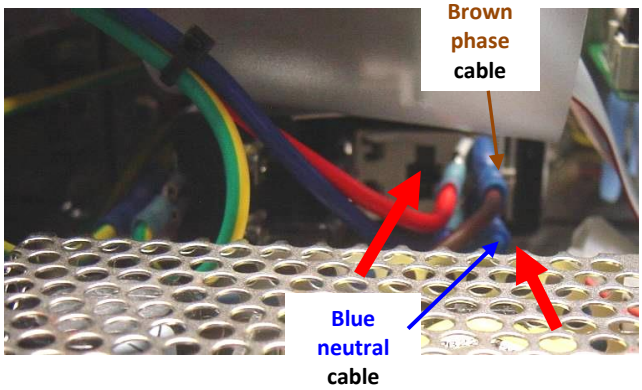
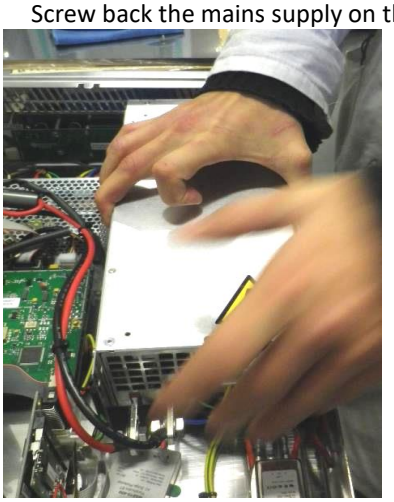
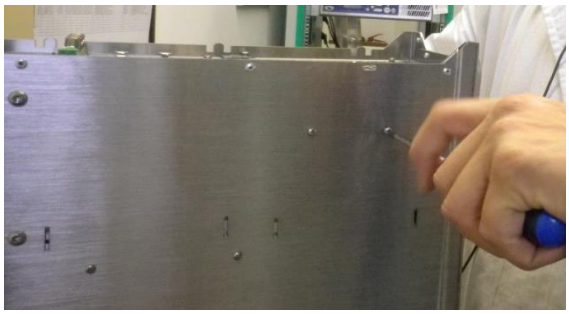


Place the double lug as shown above (red lugs on the outside)

7. **If the power supply was previously extracted,** put it back in place taking the same precautions:
   - Slide it to put it back in the pins
   - **Do not disconnect nor pinch the cables.**
   - Screw back the mains supply on the chassis.





8. Fix the surge suppressor with the mechanical piece **MX01043** and the two M3x6screws **(VIE00180)** from the outside.
   - Slightly fold the piece as shown below:

before

after

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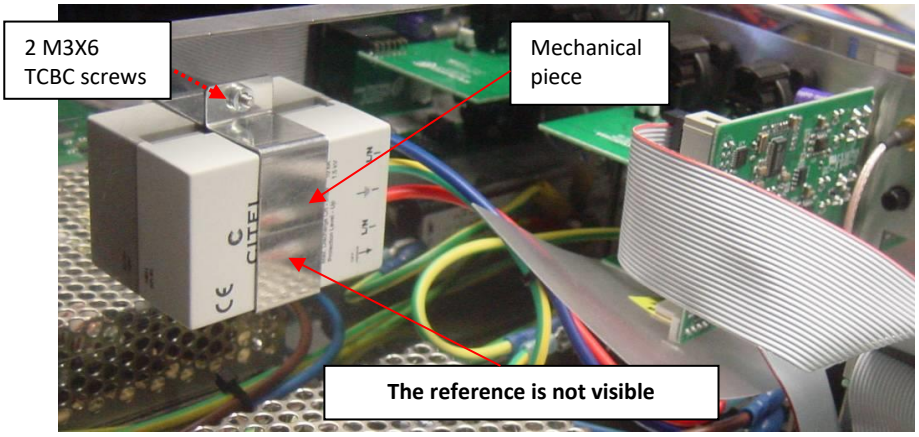
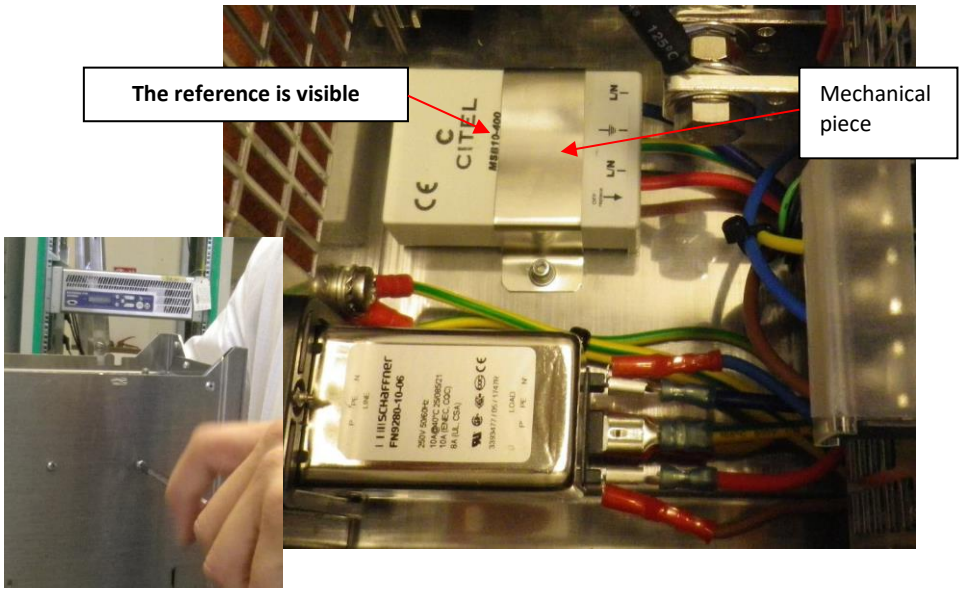
- Depending on the unit, the surge suppressor is fixed on the side or on the bottom: ideally, the reference must be visible.

Surge suppressor fixed on the chassis (screw from the outside)



Surge suppressor fixed on the bottom (screw from the bottom):



9. Do a visual check to seek for unplugged cables or moving parts.
10. Close and screw the lid back on
11. Connect the mains to the unit and check that it switches on and that the surge suppressor LED is on (on the photo below, the reflection of the module's green LED is visible).

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E.5. Replacing an audio board

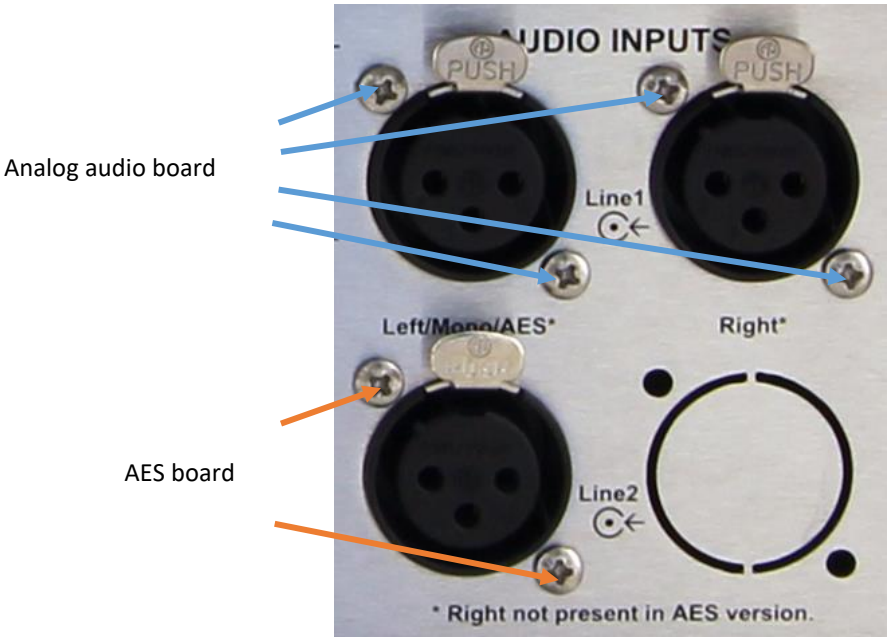
This procedure must be used to replace a defective audio board or to replace the analog audio board by an AES board.

❗ ***Software version 1.4 or more is required to replace the analog audio board by an AES board.***

In the standard configuration, the transmitter is fitted with:

- One analog audio board (Line 1)
- One AES board (Line 2)

1. Turn off the module and unplug it from the mains.
2. Unscrew all lid screws and remove the lid.
3. On the rear panel, remove screws for the board that needs to be replaced: 4 screws for the analog audio board, 2 screws for the AES board:



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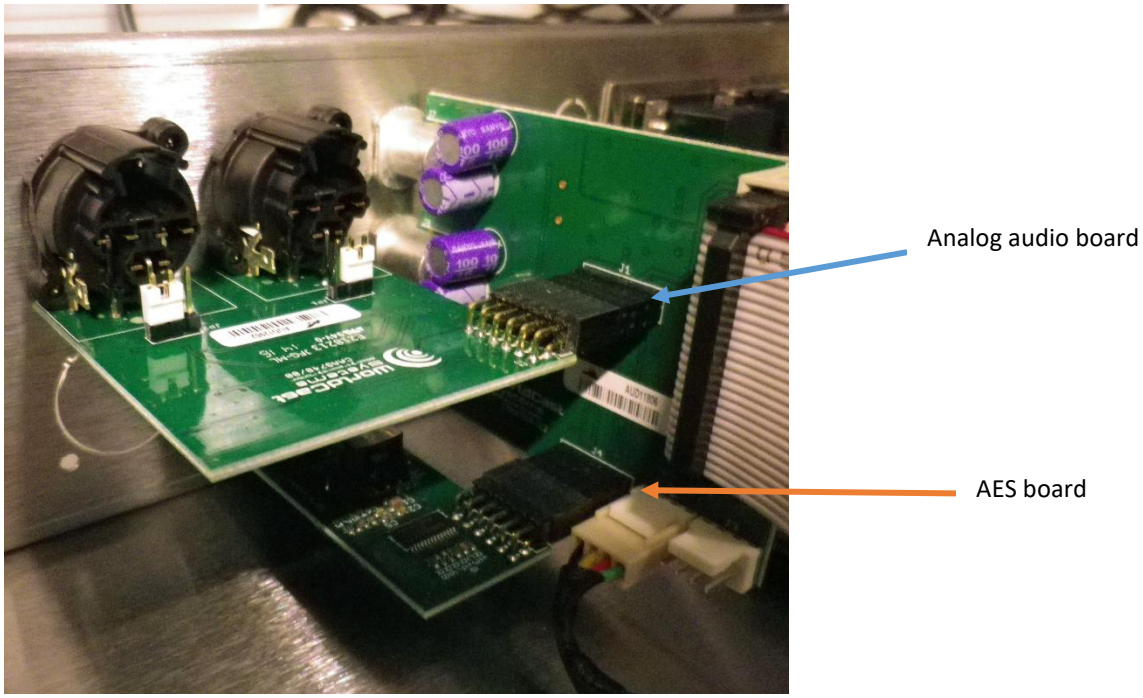
4. Inside, disconnect the board by pulling lightly and take it out.



5. Place the new audio board by first putting the BNC connectors through the rear panel cutouts, and then connect it to the commutation board.
6. Screw the 2 or 4 screws on the rear panel.
7. Screw the lid back in place.

If you have replaced the analog audio board by an AES board:

8. Set the supplied plug in the unused cutout.
9. Calibrate the transmitter with the supplied file.

   Please refer to Appendix E for the calibration procedure.

The audio board type is automatically detected by the transmitter at startup. Audio input parameters previously set are kept with no required additional step beyond a quick check!

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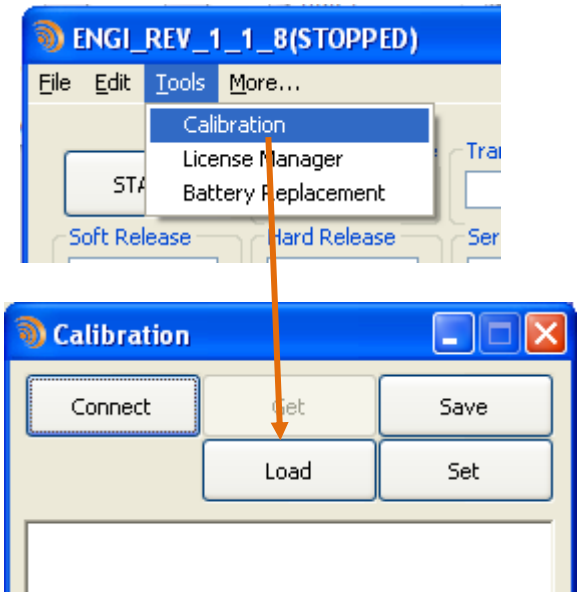
APPENDIX F: TROUBLESHOOTING PROCEDURES

F.1. Calibration



! ***Your transmitter is calibrated in factory and should not need to be recalibrated.***
In case it become misadjusted, first contact our technical support department. They may advise you to recalibrate the unit, in which case you will be sent the calibration file.

Connect your module to a PC to be able to use the PC application (see chapter 7). Once connected launch the application and:

- Open the Calibration window using the Tool/Calibration menu.
- Click the "Load" button and select the .cal calibration file supplied by WorldCast Systems.
- Click the "Set" button to load the calibration file into the unit.

F.2. Complete Reset of the ECRESO FM

! ***The reset procedure erases the whole configuration; however the calibration is kept.***

! ***After a configuration reset, we recommend you check parameters meant to protect the transmitter: hard clipper activation/deviation and VSWR Trip.***

Connect a PC to the front panel serial port as described in chapter 6.

Send the command:

```
SYS.RAZ=RAZ
```

After the module has restarted, on the front panel:

- Select YES to indicate the module acts as a central unit, NO if there is an ECRESO Control Unit).
- If it is CCU, the TX PCAP screen appears: select the transmitter's nominal power (example 750(1PA) for an ECRESO FM 750 W).
- Set the CAN Id according to the transmitter type.
- If it is part of a N+1 system, indicate whether it is the reserve transmitter.
- Exit the Init Config menu to return to standard menus.

```
IS CCU
-> YES
```

```
TX PCAP
-> 750(1PA)
```

```
ID CAN
-> 00
```

```
IS RESERVE?
-> NO
```

```
INIT CONFIG
EXIT
```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APPENDIX G: EMR & SECURITY

G.1. Transmitter Notification Protocol

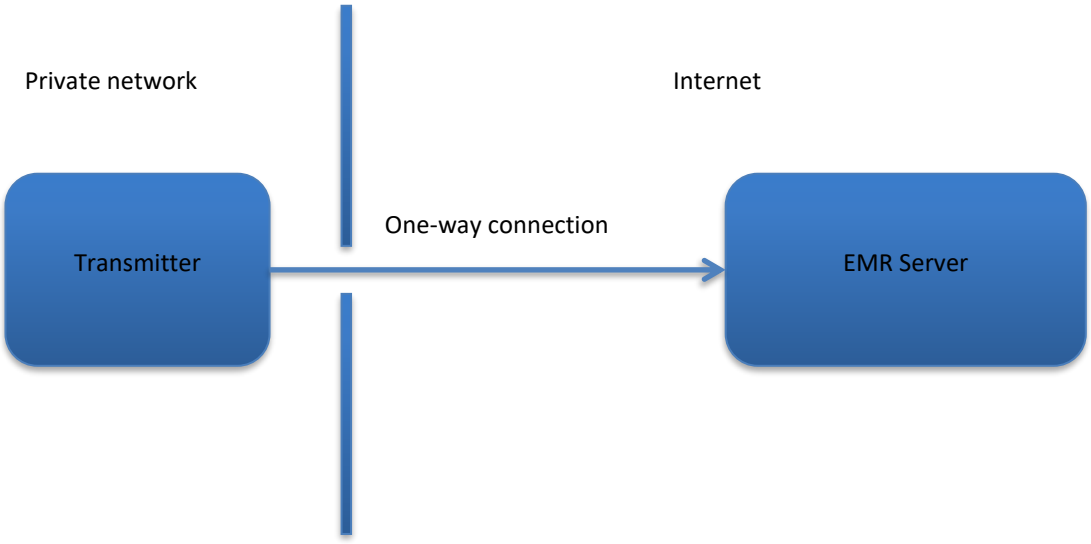
As soon as the EMR option is activated in the transmitter, or after a restart, the Transmitter's IP Module will send a notification packet to the EMR server. Then an update to this notification packet will be sent every 60 minutes (or any configured interval).

The notification packet is a JSON (www.json.org) payload transferred into an HTTP/S POST message, encrypted with the standard TLS protocol. In case of connection failure the transmitter will not retry until the next scheduled attempt.

In case of an alarm inside the transmitter, a notification packet will be issued immediately.

JSON packet payload contains only technical information related to the transmitter status and measurements.

In order to succeed the transmitter needs a route to the Internet (setting the gateway accordingly), and an unfiltered outbound access to https port. Firewalls are usually not restricting outgoing connections, so no specific changes have to be done. DNS access is also required to reach the EMR server, but as a common service, DNS protocol is almost always authorized by firewalls. Note that the transmitter factory settings use Google's public DNS servers (see https://developers.google.com/speed/public-dns/), so you don't have to provide your own.



G.2. EMR Server Security

Sensitive data is stored in the server database in a protected form. All customer private information, and transmitter nature and localisation are stored encrypted. In case of a theft of the database files or backups, no useful information will be readily available; the effort that would be required to breach the security would be disproportionate compared to the value!

User passwords are not stored at all in the server. Authentication is done using the HMAC protocol (see http://en.wikipedia.org/wiki/Hash-based_message_authentication_code). Stored password hashes are encrypted using PBKDF2 protocol as recommended by USA NIST (see http://csrc.nist.gov/publications/nistpubs/800-132/nist-sp800-132.pdf).

EMR Web Server automatically uses the secured HTTP/S protocol, and cannot be accessed with an unsecured connection.

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