

HELIOS FM 350 W
HELIOS FM 750 W
HELIOS FM 1000 W
HELIOS FM 1500 W
HELIOS FM 2000 W
USER MANUAL



87.5 – 108 MHz

STEREO AND MULTIPLEX COMPACT FM DIGITAL TRANSMITTER
WITH TCP/IP MONITORING*

**depending on options*

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1. INTRODUCTION

1.1. About Ecreso

Founded in 1956 near Bordeaux, ECRESO was created by radio broadcasting enthusiasts and counts today as one of the most important players on the international broadcasting stage.

ECRESO offers analog and digital radio as well as digital TV transmitters (FM, DAB, DAB+, T-DMB, DVB-T/H), low power transmitters, which are air-cooled, as well as high power devices either air or water-cooled.

ECRESO is part of the WorldCast Systems group of companies which combines the collective expertise & extensive product portfolio of several major broadcast brands to offer turnkey systems in all major analog and digital technologies. Other brands within the group include:

- Audemat who designs monitoring equipment for analog and digital radio and TV as well as an extensive range of facility remote control solutions.
- APT Codecs who offer reliable and cost effective broadcast codec platforms delivering high quality content over IP, T1, E1, ISDN & Leased Lines.

As such, WorldCast Systems can offer complete broadcast solutions for the delivery, transmission and monitoring of broadcast content throughout the broadcast chain.

The group is founded on three core values:

1) **Product innovation:**

Audemat places a key emphasis on Research & Development and its innovative approach has been repeatedly recognized by the industry. WorldCast Systems has won awards for innovation at consecutive NAB Shows for over 10 years.

2) **Customer satisfaction:**

Audemat is dedicated to ensuring the best quality, value and service for its customers and has achieved ISO 9001 certification.

3) **Sustainable Development:**

Audemat is committed to sustainable development and demonstrates this commitment in several ways: it adheres to the UN Global Compact project and all new products are developed in keeping with an eco-design philosophy and built within Audemat's low energy consumption factory.

Audemat employs around 80 employees at headquarters in Bordeaux-Merignac, France. Audemat also has a subsidiary in Miami, USA that manages the North & South American markets as well as sales offices in the UK and India. An extensive network of international dealers and distributors means that the company is represented in over 45 countries throughout Europe, Middle East, Africa and Asia.

1.2. Before you start

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.



Electrical precautions

- Unplug from mains outlet 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 protection 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
- Do not immerse the battery in water
- Do not throw away the used battery, recycle it instead. You may send it back to us if needed.

If these precautions are not followed, the guarantee will be void.

2. DESCRIPTION

2.1. General description

Combining the very latest technologies with our proven RF experience, our 350 W, 750 W, 1000 W, 1500 W and 2000 W 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 74%. 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.

The Helios FM 350 W, the Helios FM 750 W, the Helios FM 1000 W, the Helios FM 1500 W and the Helios FM 2000 W are fully protected against overheating, VSWR and lightning.

In addition, several innovative features are available, such as RDS encoding and automated audio backup. Fully featured for local maintenance and configuration, it also allows full remote control by Web server, SNMP, RS232 or GPIOs*.

* Options available with the current version are:

- Basic RDS: the internal RDS encoder makes it possible to manage basic RDS parameters (PI, PS, TP, TA, PTY, MS, DI, radiotext, PTYN, group sequence, AF, 1 PSN, 2 DSN, dynamic scrolling PS)
- GPIO: this additional board allows remote control and management of your transmitter.
- TCP/IP: this additional board allows remote configuration via a web site and SNMP management

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.



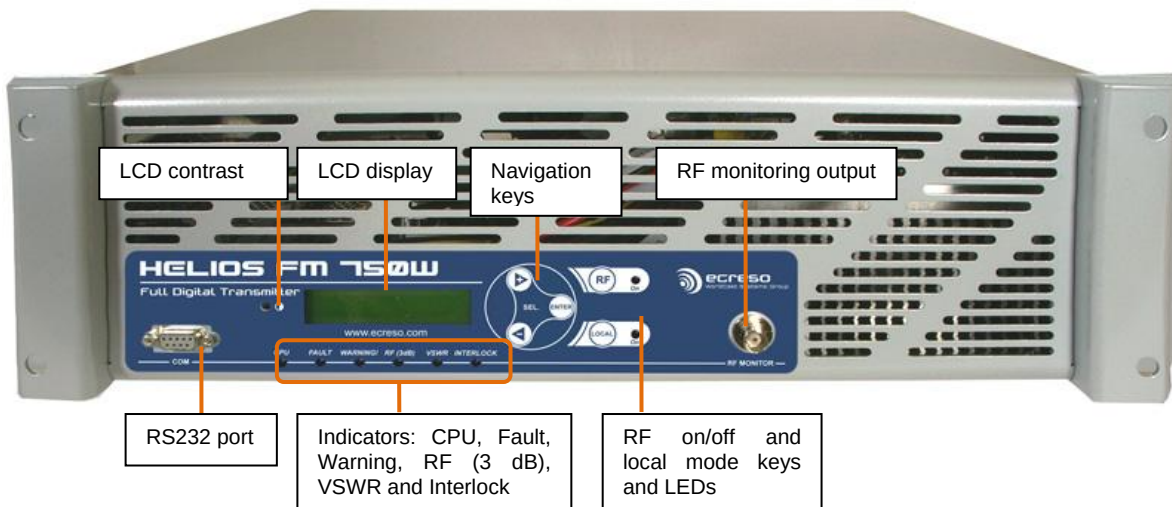
2.2. Accessories

The Helios FM is supplied with:

- 1 power cable
- 1 serial cable
- 1 USB cable
- 4 10 A fuses (for Helios FM 350 W, 750 W and 1000 W only)
- 1 interlock plug
- 1 box including 1 CD (documentation + PC application) and 1 quick start notice.

2.3. Helios FM 350 W / 750 W / 1000 W / 1500 W / 2000 W Description

2.3.1. Front panel



Description of indicator LEDs:

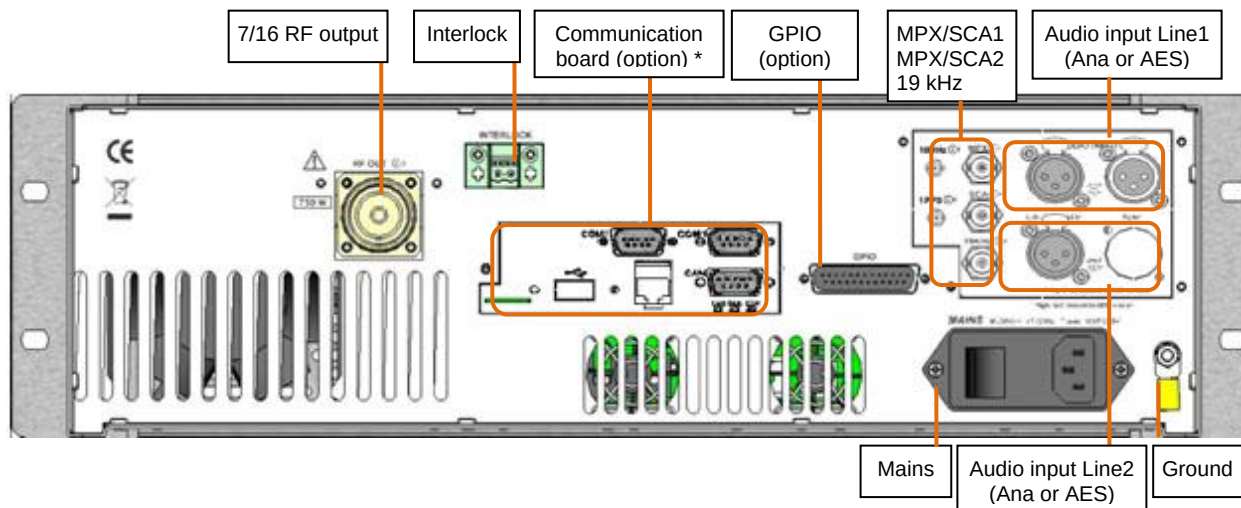


- CPU: blinks to indicate CPU activity
- FAULT: major fault of the unit (RF / VSWR protection, Temperature, ...)
- WARNING: minor fault of the unit (ambient temperature, radiator temperature, fan, current, voltage, loss of signal).
- VSWR: VSWR of the unit
- RF (3dB) : 3 dB of the unit
- INTERLOCK: indicates 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

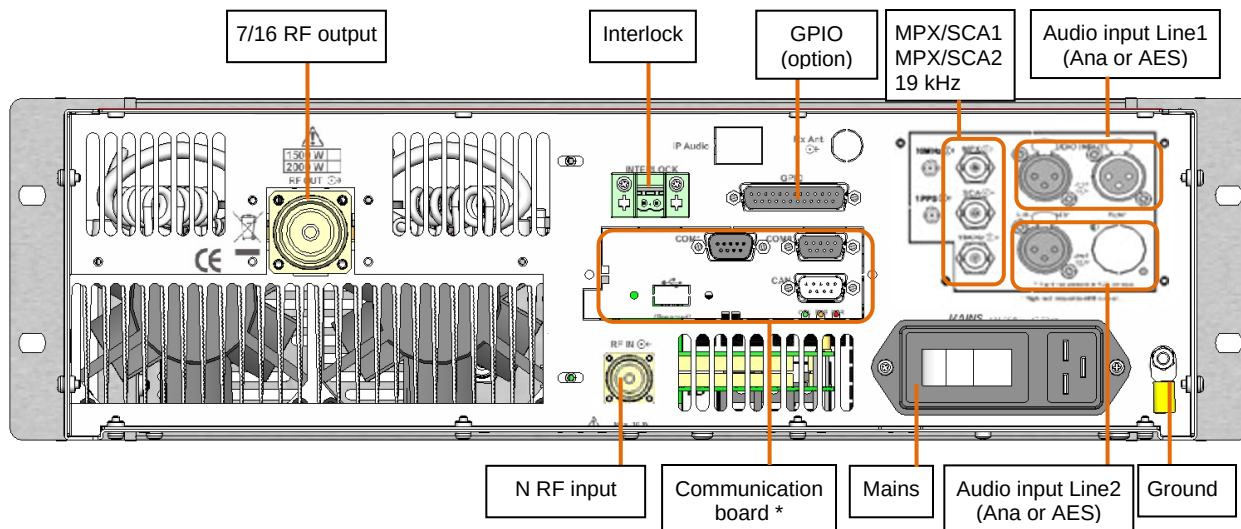


2.3.2. Rear panel

Helios FM 350 W / 750 W / 1000 W



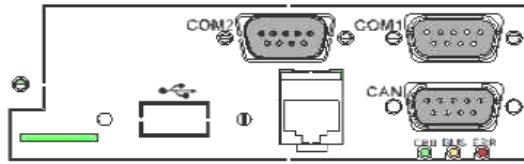
Helios FM 1500 W / 2000 W



* Two optional communication boards are available:

TCP/IP board

- 2 RS232 ports (COM1 and COM2)
- 1 μ SD card
- 1 USB port
- 1 Ethernet port
- 1 CAN port



CAN board

- 2 RS232 ports (COM0 and COM1)
- 1 slave USB port
- 1 CAN port

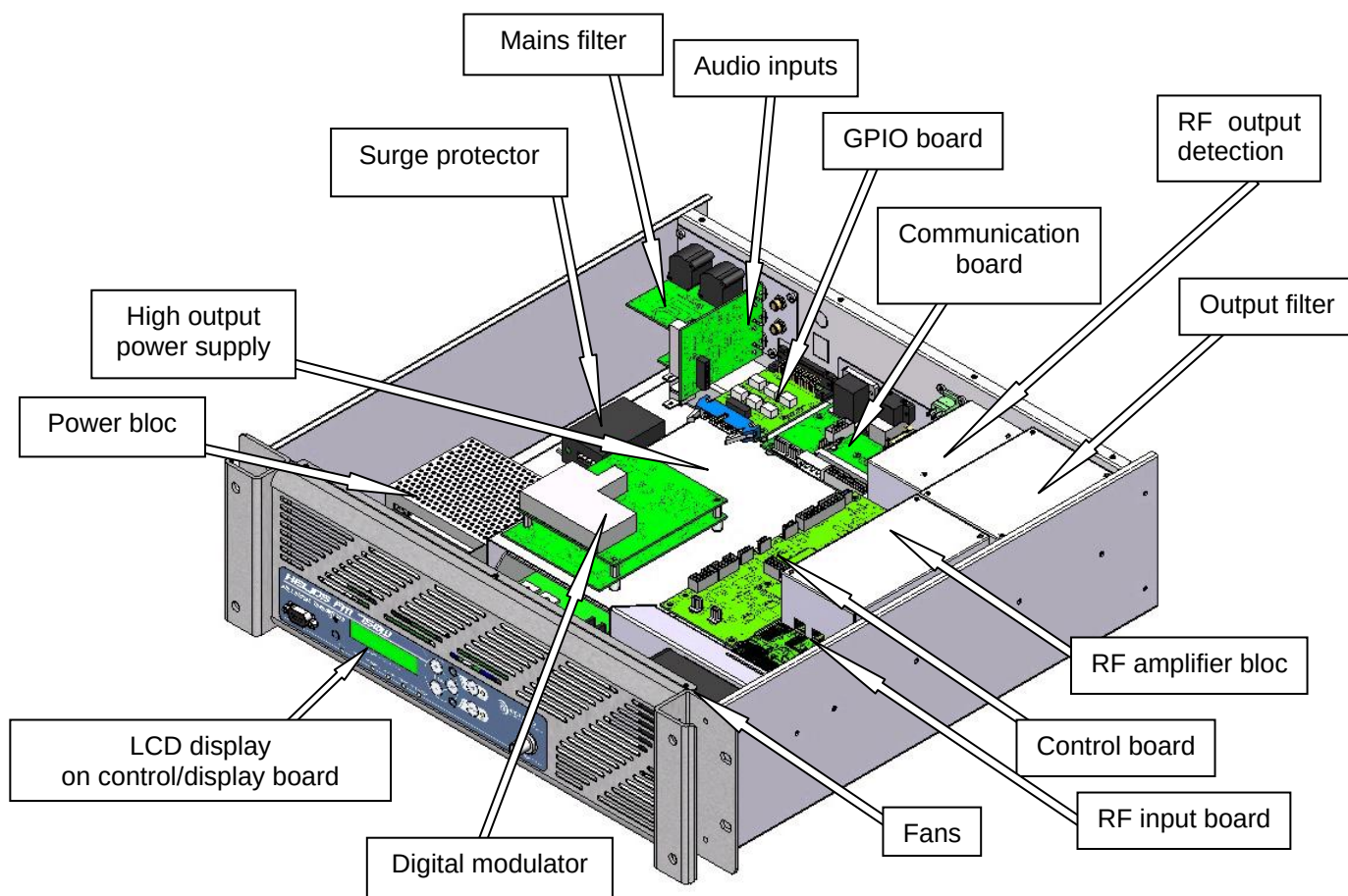


On the CAN board, the COM0 port is reserved for the unit's upgrade.

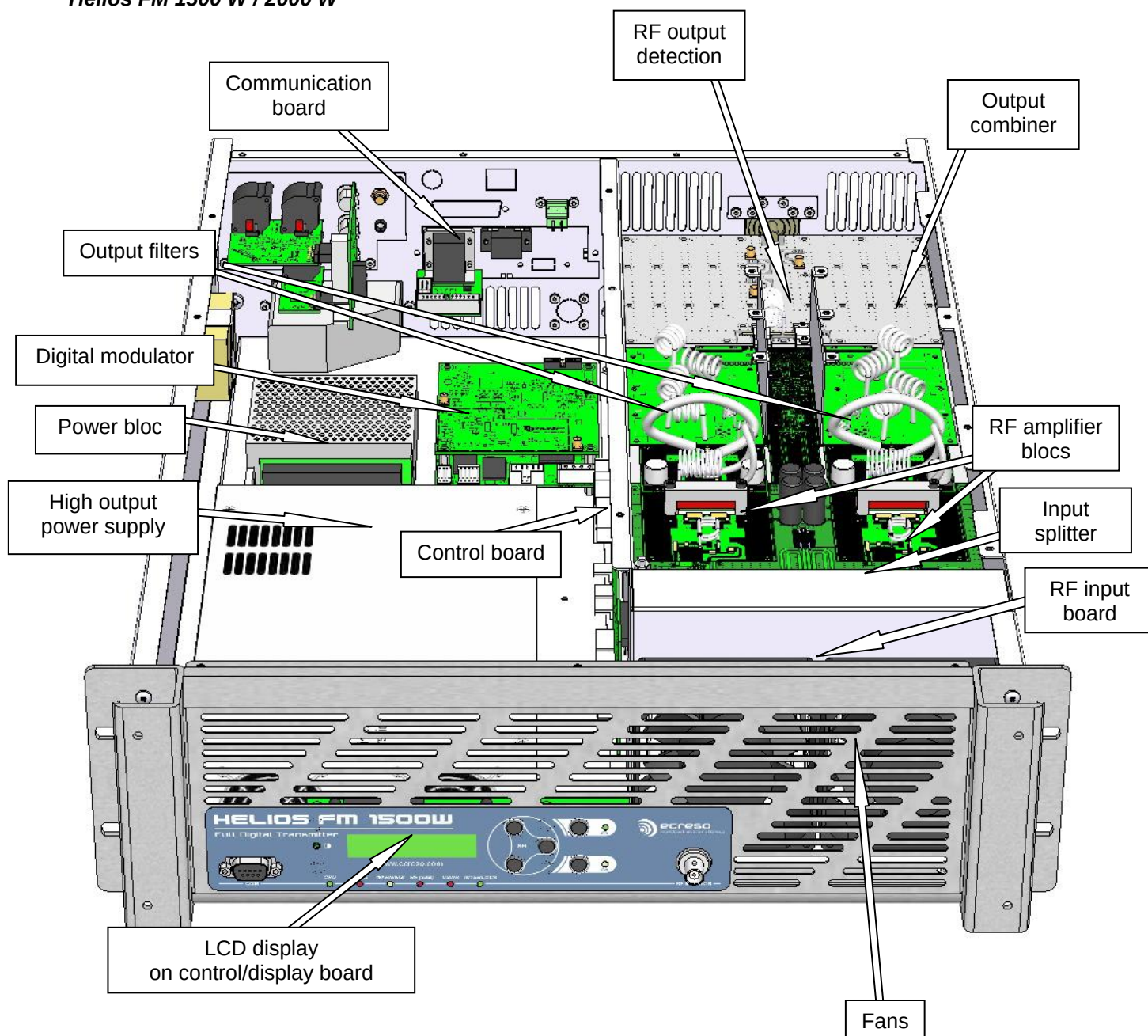
Please note that the 19 kHz output and the 10 MHz input are not enabled on this preliminary version.

2.3.3. Opened cover

Helios FM 350 W / 750 W / 1000 W

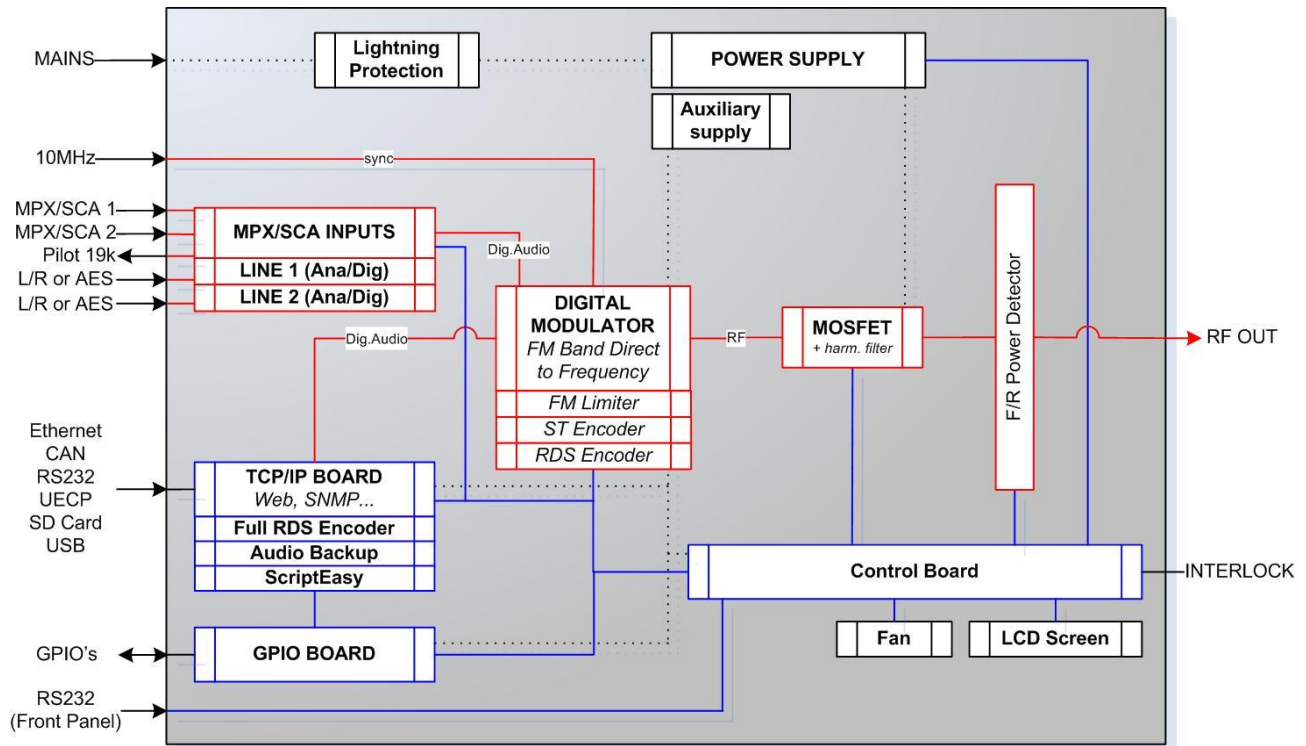


Helios FM 1500 W / 2000 W

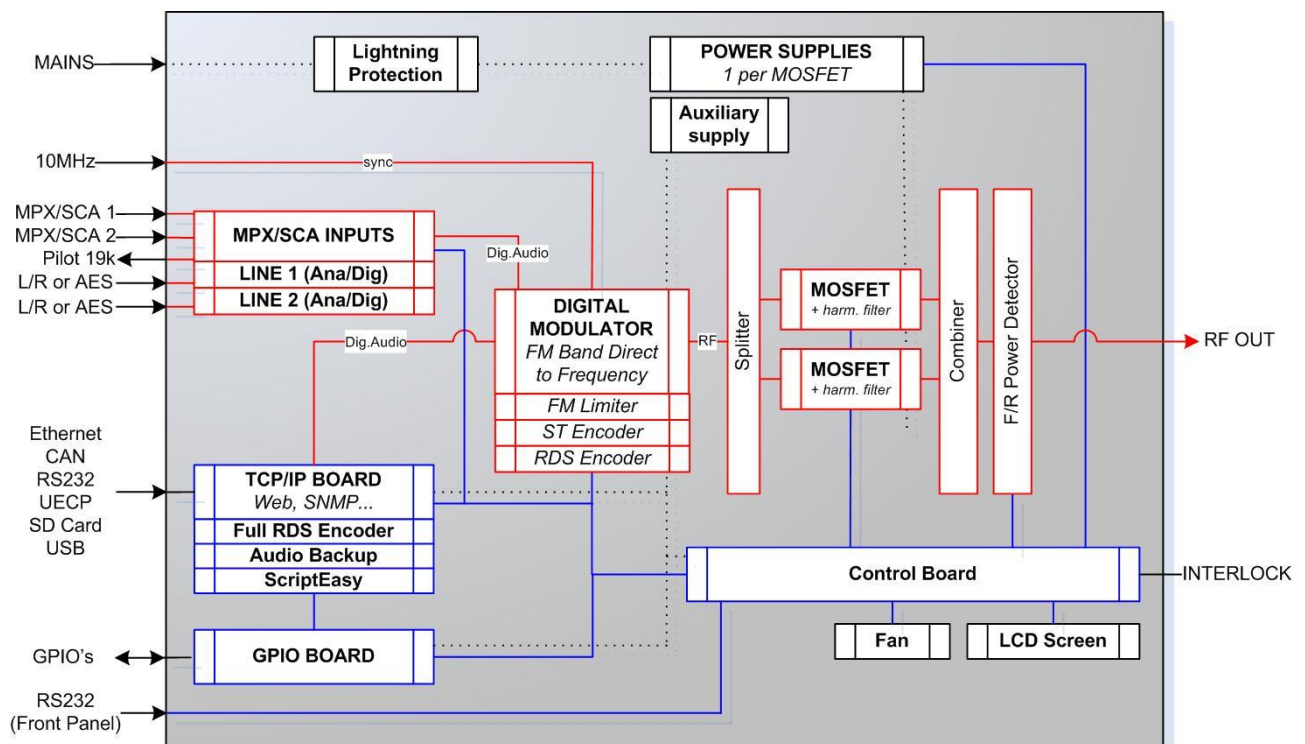


2.3.4. Synoptic

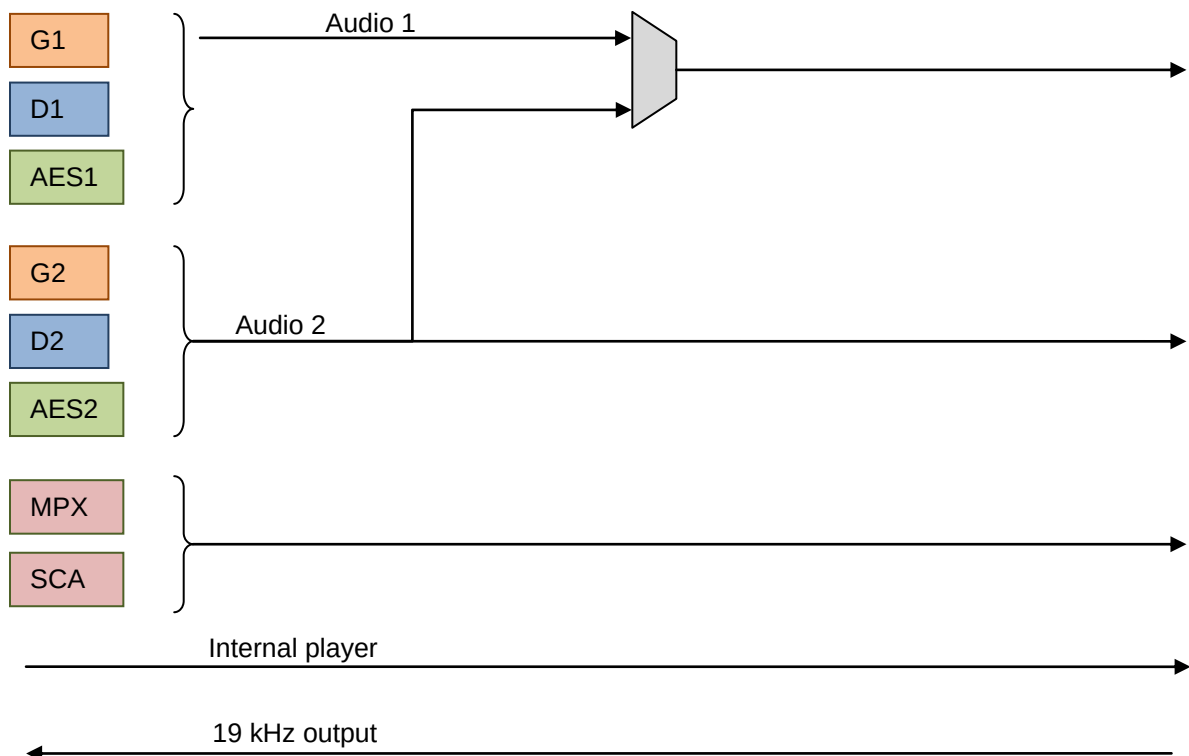
Helios FM 350 W / 750 W / 1000 W



Helios FM 1500 W / 2000 W



Audio



2.3.5. 3U Rack

The choice of stainless steel as material guarantees against corrosion. The rack structure and the structure of the monoblock front panel reinforce the device. The rectangular outline of the front panel has an LCD display. The transport handles are mechanically interchangeable and can be removed. The cover is fixed by a set of M3 POZIDRIV screws and can be easily removed. The user has access to every module to set the parameters of the device.

2.4. Protecting the transmitter

To ensure the transmitter will work with no risk of damage, a series of protections have 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 Ecreso 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.
- **Software protection:**
The reflected power is limited to 3 W for Helios FM 20 W, to 10 W for Helios FM 100 W, to 40 W for Helios FM 350 W / 750 W / 1000 W and to 80 W for Helios FM 1500 W / 2000 W
- **Software settings for the reflected power security management** (see VSWR Trip, section 5.4.1).

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 radiator temperature are monitored.

- The max ambient temperature is set by software (see menu Temp/Fan, section 5.3.18), default value is 50°C. In case of overshoot, a Warning alarm is triggered (Alarm Amb).
- The max radiator temperature is set by serial command (see serial command CONF.HEAT.MAX, section 6.2.3), default value is 65°C. In case of overshoot, a Warning alarm is triggered (Alarm Heat).
- The max internal temperature is set at 70°C. If the temperature exceeds 70°C, the RF is cut off and a fault alarm is triggered (Alarm Temp).

2.4.4. Protections incorporated into the PSU

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).

The amperage is also measured. The threshold varies depending of the power of the Helios FM: 2 A for the Helios FM 20 W, 8.5 A for the Helios FM 100 W, 20 A for the Helios FM 350 W, 23 A for the Helios FM 750 W, 29 A for the Helios FM 1000 W, 26 A per amplifier pallet for the Helios FM 1500 W, 31 A per amplifier pallet for the Helios FM 2000 W. In case of overshoot, a Warning alarm is triggered (Alarm Cur) and the nominal power is reduced.

3. TECHNICAL SPECIFICATIONS

3.1. RF section

Frequency range	87.5 to 108 MHz
Summary of different steps	10 kHz
Frequency stability	$< 10^{-6}$ per year
Power range	50-350 W, 50-750 W, 50-1000 W, 150-1500 W or 200-2000 W @ ROS=1.35
Power output	continuously 50-350 W, 50-750 W, 50-1000 W, 150-1500 W or 200-2000 W
Spurious and harmonic suppression	> 75 dBc

3.2. 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	$< 0.1\%$ (50 dB) RMS (20-20 000 Hz)

3.3. Stereo operation

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

3.4. Mono operation

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

3.5. AF inputs

Analog (LINE1)

Connector	"XLR" type
Impedance	> 10 k Ω 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 kb/s
Bit	16, 24, 32

Multiplex (MPX/SCA)

Connector	"BNC" type
Impedance	> 5 k Ω unbalanced
Level	Software adjustable (-18/+18 dBu range)

3.6. HF output

Connector	7/16 type
Impedance	50 Ω

Monitoring (RF Monitor)

Level	
Helios FM 350 W / 750 W / 1000 W	10 dBm $\pm$ 3 dB @ 750 W at main output
Helios FM 1500 W / 2000 W	10 dBm $\pm$ 3 dB @ 1500 W at main output
Slope	20 x Log (F/98)
Directivity	>20 dB in the band

3.7. Power supply

Voltage	184 VAC to 264 VAC
Frequency	47 Hz - 63 Hz
Max consumption	550 W @ nominal power (350 W version) 1150 W @ nominal power (750 W version) 1550 W @ nominal power (1000 W version) 2300 W @ nominal power (1500 W version) 3050 W @ nominal power (2000 W version)

Fuses (for Helios FM 350 W / 750W / 1000 W) 10 AT

3.1. Interface panel

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

3.2. Environmental

Nominal operating temperature	5°C to 45°C
Maximum operating temperature	0°C to 50°C
Warehousing temperature	-20°C to +70°C
Warehousing time	< 10 years
Cooling	Internal ventilation Helios FM 350 W: ~20 l/s Helios FM 750 W: ~20 l/s Helios FM 1000 W: ~20 l/s Helios FM 1500 W: ~55 l/s Helios FM 2000 W: ~55 l/s

3.3. Physical

Helios FM 350 W / 750 W / 1000 W

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

Helios FM 1500 W / 2000 W

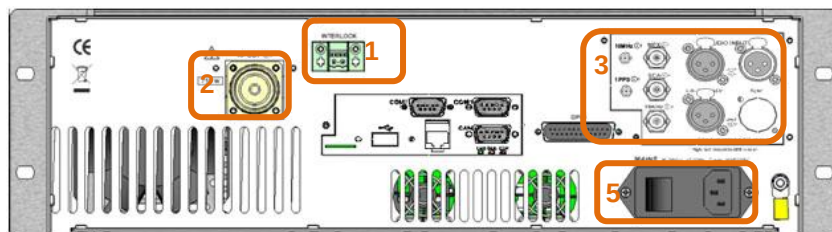
Overall dimension	19" (482.6 mm) X 3U (133.5 mm) X 690 mm
Rack size without front panel	440.4 X 126.2 X 620 mm (WxHxD)
Enclosure depth required	700 mm
Mounting	19" enclosure, with 4 M6X12 screws
Weight	around 18 kg

3.4. Miscellaneous

Marking	CE
Standards	1999/5/CE (R&TTE)
	ETS 302 018 (EMC)
	ETS 300 384 (Radio)
	NF EN 60215 (Safety)

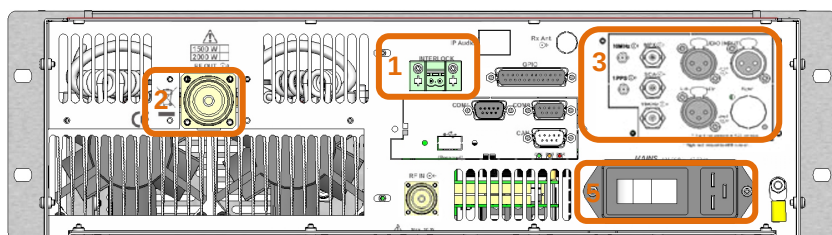
4. STARTING UP YOUR TRANSMITTER

4.1. Connecting the transmitter



Rear panel

Helios FM 350 W / 750 W / 1000 W



Rear panel Helios 1500 W / 2000 W



Front panel all versions

1. Make sure the interlock plug is present on the rear panel
2. Connect the transmitter RF output to a 50 Ω load with a wattmeter.
3. The 50 Ω charge power must be greater than 500 W for a 350 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 and 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 or serial commands.

4. Connect the audio or MPX inputs.
5. To use the PC application or the serial commands, connect a PC to the serial port on the front panel of the Helios.
If your PC does not have a RS-232 port, use a USB/RS-232 cable.
6. Connect to power using the provided cable; you may unscrew the cable loop and pass the power cable through it to secure it.
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 PC application: see section 4.3.

To set network parameters (TCP/IO option only): see section 4.4.

To use serial commands, see section 6.

4.2. Using the front panel

Please refer to section 5.2 for front panel working principle.

4.2.1. Setting the transmitter

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

```

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

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

```

  9 8 . 0 0 M H z      0 W
-> T X   P A R A M E T E R S >
  
```

Once you see this screen, press "Enter"

```

  1      F R E Q      P F W D
-> 9 8 . 0 0      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      F R E Q      P F W D
-> 9 8 . 0 0      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 all digits and confirm with the "Enter" key. Use the "+" to go the next parameter.

```

  1      F R E Q      P F W D
  1 0 4 . 0 5      -> 0
  
```

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      G O   T O
      M A I N      -> R F
  
```

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

```

      G O   T O
-> I N P U T   S W I T C H >
  
```

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

```

1  I N P U T   S E L E C T
   -> M O D E : M A N U
  
```

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

```

1  I N P U T   S E L E C T
   -> M A I N : L I N E 1
  
```

Select the current input:

- "LINE1" for analog (see sections 9 to 11)
- "LINE2" for AES (see sections 9 to 11)
- "MPX1" for MPX (see sections 8 and 11)
- "MPX2" for MPX (see sections 8 and 11)
- "PLAYER": internal generator

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 -> I N P U T   S E L
  
```

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

4.2.3. Setting the MPX inputs

```

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

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

```

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

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

```

2      M P X - I N -> 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 - I N      M P X 1
  
```

Press the “+” key until you see this screen. When the MPX-IN 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 - I N
  
```

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.

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
- MONO
- MONO_L
- MONO_R

Selecting STEREO enables the internal 19 kHz; you will therefore want to select MONO for an MPX input.

```

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.

```

      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.

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 μ s. Depending on your country, you might need to switch it to 75 μ s (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.

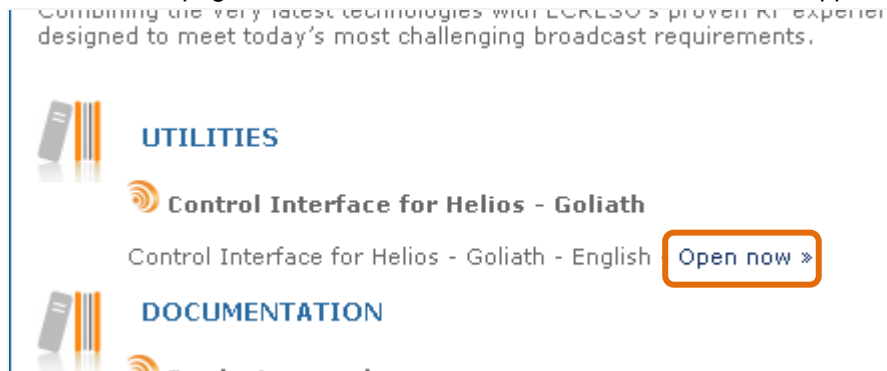
4.2.6. Getting on air

1. Disable the RF to turn off the transmitter 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.

4.3. Using the PC application

4.3.1. Connecting with the control software application

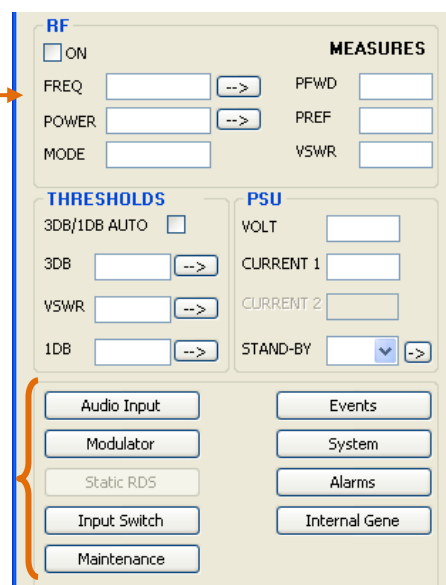
- On the PC, start the control software. This is a set-up tool that will allow you to quickly set and test your transmitter. It is available on the supplied CD.
 - On the transmitter's page, click the control interface link to download the zipped file to your PC.



- Extract the .exe file. You do not need to install it, simply double-click on ENGI_REV_xxx.exe to launch the application.
- Select the serial port connected to the Helios, and the port speed (9600 for the front panel connector).

4.3.2. Setting the transmitter

- Set the power (in W), the frequency (in MHz) and enable the RF.
- To send a parameter value to the transmitter, click the login button; no password is set in factory. Click the  button to the right of the text zone.
- A set of buttons give access to other parameters. Click on one of them to open a window displaying associated parameters. The "Audio Input" and "Modulator" windows will enable input and MPX configuration.



4.3.3. Input selection

The input can be set to:

- Line1 for the analog inputs (see sections 4.3.4 to 4.3.6)
- Line2 for the AES (see sections 4.3.4 to 4.3.6)
- MPX1 and MPX2 inputs (see sections 4.3.3 and 4.3.6)
- Internal generator

4.3.4. Setting the MPX inputs

Click the "Audio Input" button:

- Set the nominal level between -50 and +50 dBu



MPX1		MEASURES	
DRIVE	1	PEAK	-24
LEVEL	12.00	PRESENCE	MO

MPX2		MEASURES	
DRIVE		PEAK	-25
LEVEL	12.00	PRESENCE	MO

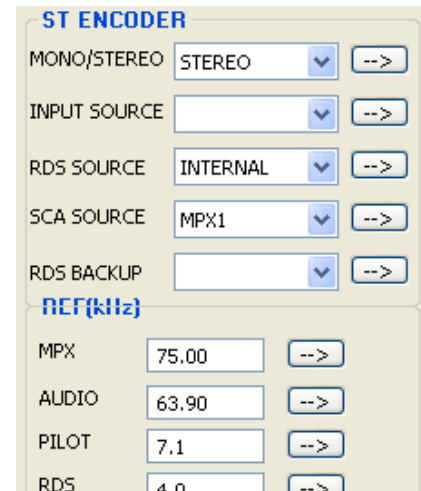
4.3.5. MPX configuration

Click the "Modulator" button:

- Set the audio type to:
 - STEREO
 - MONO
 - MONO_L
 - MONO_R

Selecting STEREO enables the internal 19 kHz; you should therefore select MONO for an MPX input.

- Set the total deviation between 0 and 150 kHz
- Set the pilot deviation between 0 and 25.5 kHz

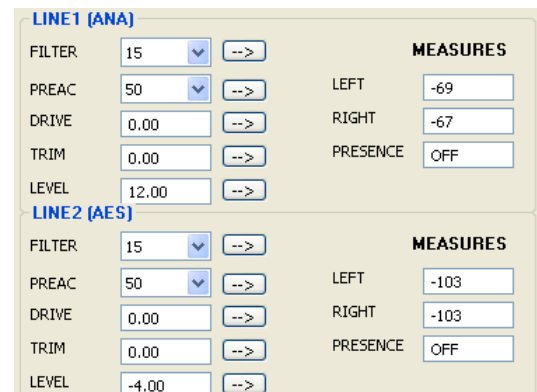


ST ENCODER	
MONO/STEREO	STEREO
INPUT SOURCE	
RDS SOURCE	INTERNAL
SCA SOURCE	MPX1
RDS BACKUP	
REF(kHz)	
MPX	75.00
AUDIO	63.90
PILOT	7.1
RDS	4.0

4.3.6. Setting the analog or AES inputs

Click the "Audio Input" button:

- Set the nominal level between -50 and +50 dBu
- Set the pre-emphasis to 0, 50 or 75 μ s depending on your country (50 μ s in Europe, 75 μ s in the USA).



LINE1 (ANA)		MEASURES	
FILTER	15	LEFT	-69
PREAC	50	RIGHT	-67
DRIVE	0.00	PRESENCE	OFF
TRIM	0.00		
LEVEL	12.00		

LINE2 (AES)		MEASURES	
FILTER	15	LEFT	-103
PREAC	50	RIGHT	-103
DRIVE	0.00	PRESENCE	OFF
TRIM	0.00		
LEVEL	-4.00		

4.3.7. Getting on air

1. Disable the RF to turn off the transmitter 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.

4.4. With the TCP/IP option

4.4.1. Network configuration

If the optional IP board is present on the transmitter, first set the IP address with the front panel:

9 8 . 0 0 M H z 0 W

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

9 8 . 0 0 M H z 1 0 0 W
-> N E T W O R K >

Once you see this screen, press "Enter".

1 N E T W O R K -> A D R
-> 1 9 2 . 1 6 8 . 0 1 2 . 1 0 3

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 N E T W O R K -> M A S K
-> 2 5 5 . 2 5 5 . 2 5 5 . 0 0 0

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

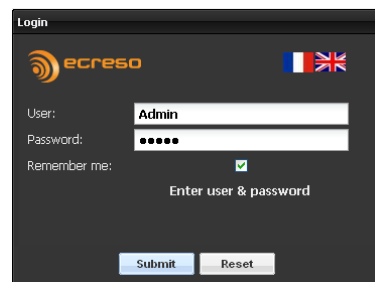
4.4.2. Connecting to the web interface

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

Open a web browser (Google Chrome, Mozilla Firefox ...) 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**).



You can now access the web interface.



 Select and set inputs using the front panel or the PC application as described above.

5. FRONT SCREEN USE

5.1. 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 / 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:

```

9 8 . 0 0 M H z      1 0 0 W
-> 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 section 5.3, “Easy” menus are in green and “Expert” menus are in orange.

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

5.2. Working principle

Three keys allow you to browse through the menus:



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.

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  button is used to:

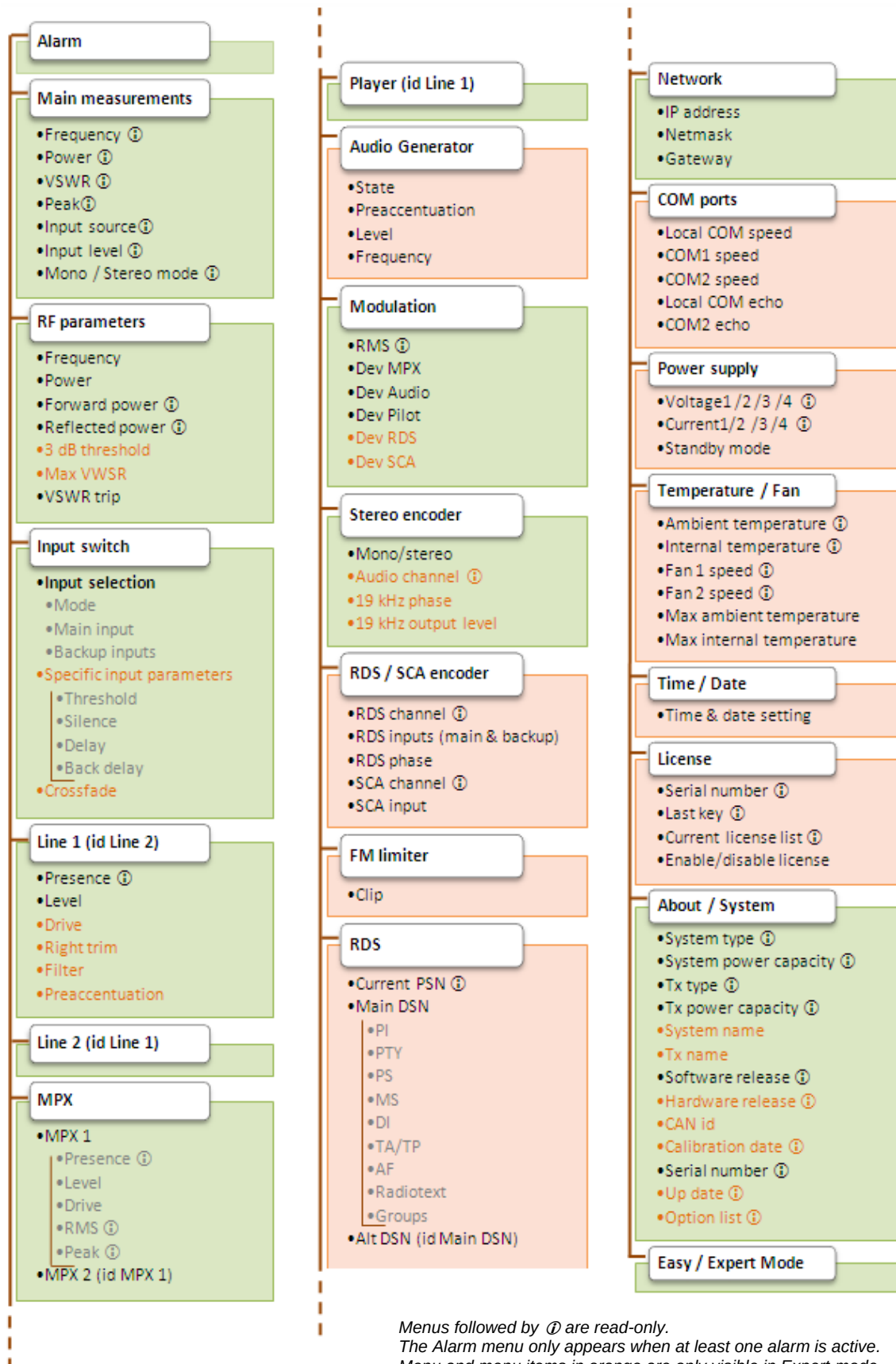
- Access a lower level menu
- Enable the edit mode for parameters that can be modified
- Confirm a new value
- Return to the higher level menu.
- Return to the main screen when pressed for a few seconds.

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  key to access the text string and  to scroll.

5.3. Structure of the menus

5.3.1. Overview



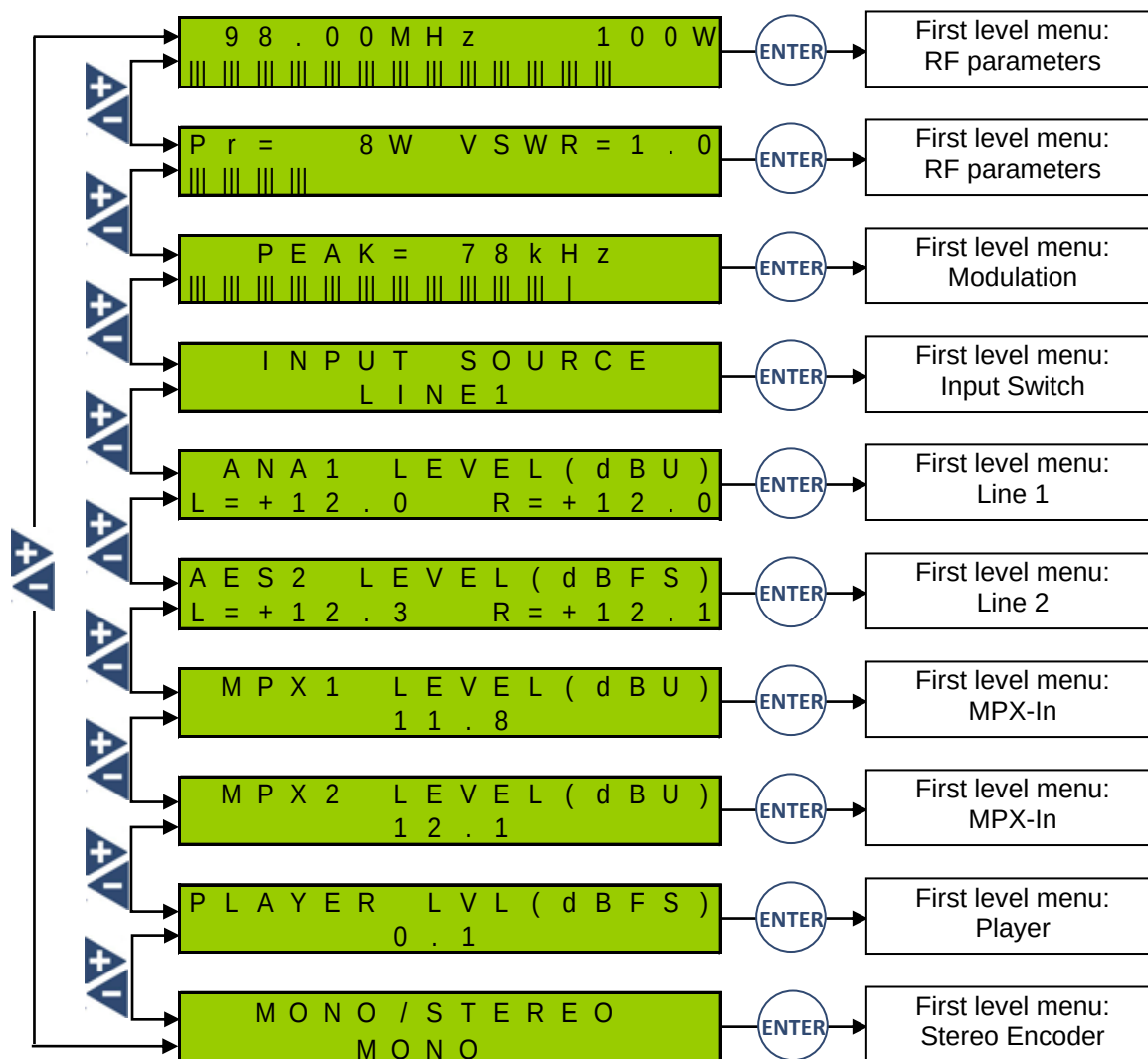
Menus followed by ^d are read-only.

The Alarm menu only appears when at least one alarm is active.

Menu and menu items in orange are only visible in Expert mode.

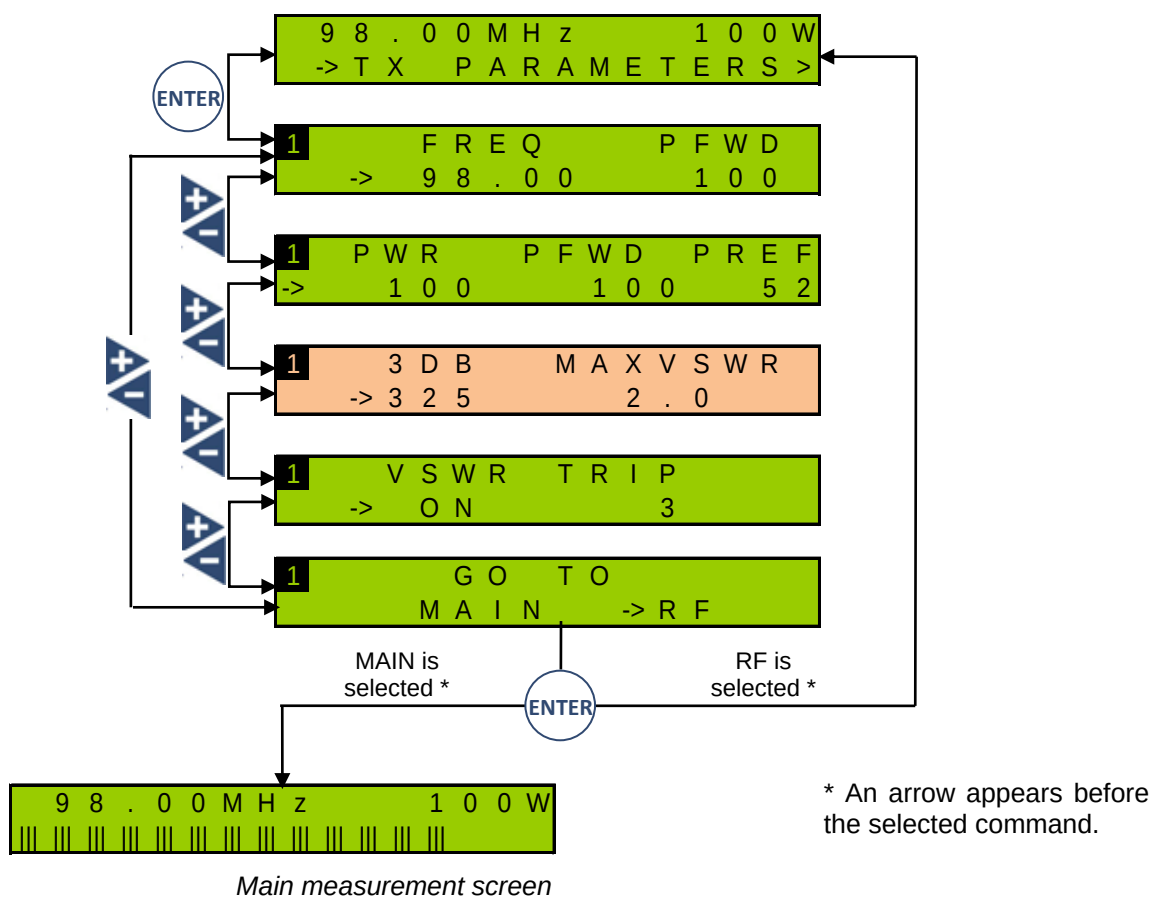
5.3.2. First level measurements

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



See next page for first level menus

5.3.4. TX PARAMETERS Menu



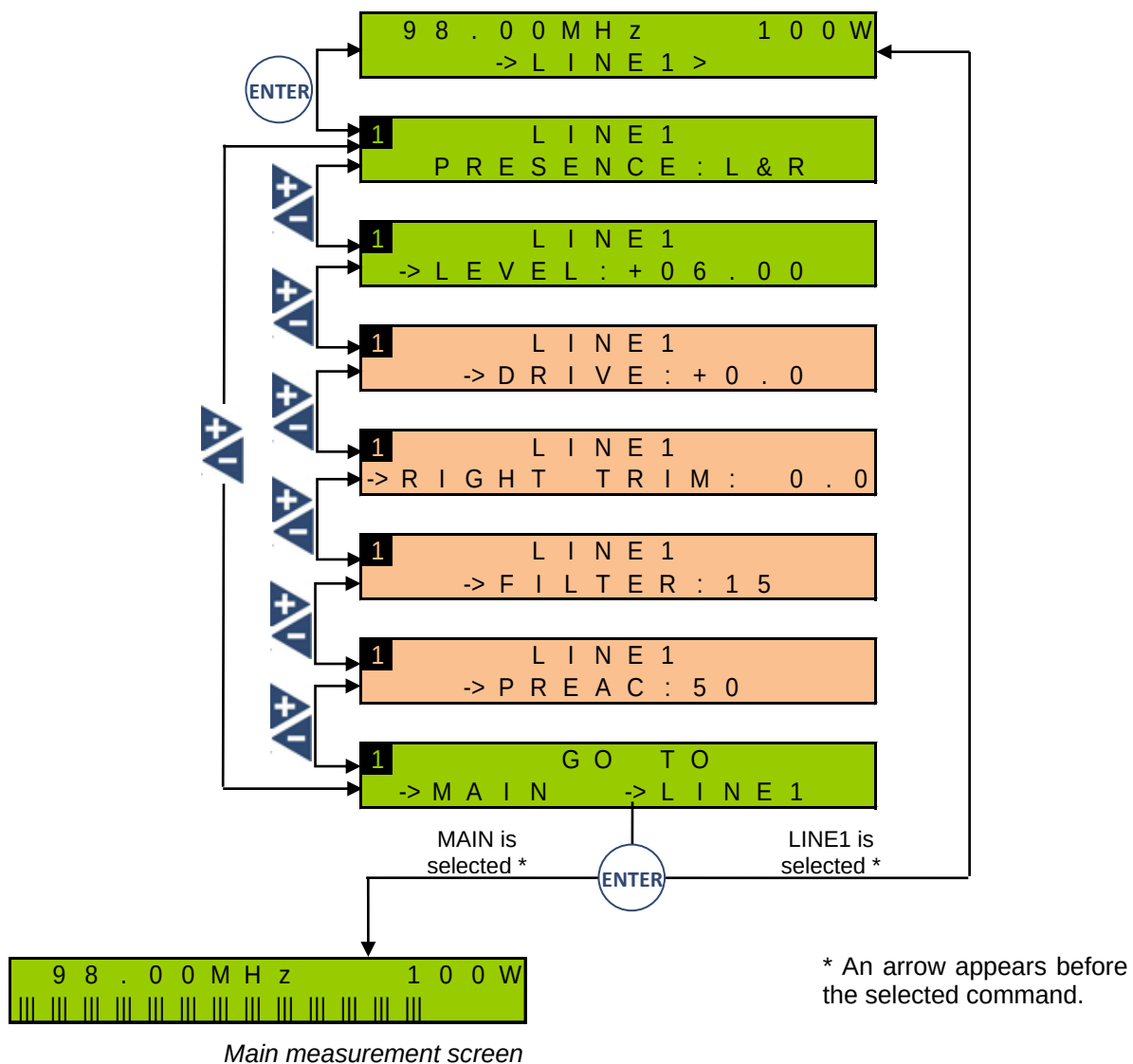
5.3.5. ALARMS Menu

104.05 MHz 100 W
-> ALARMS >

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

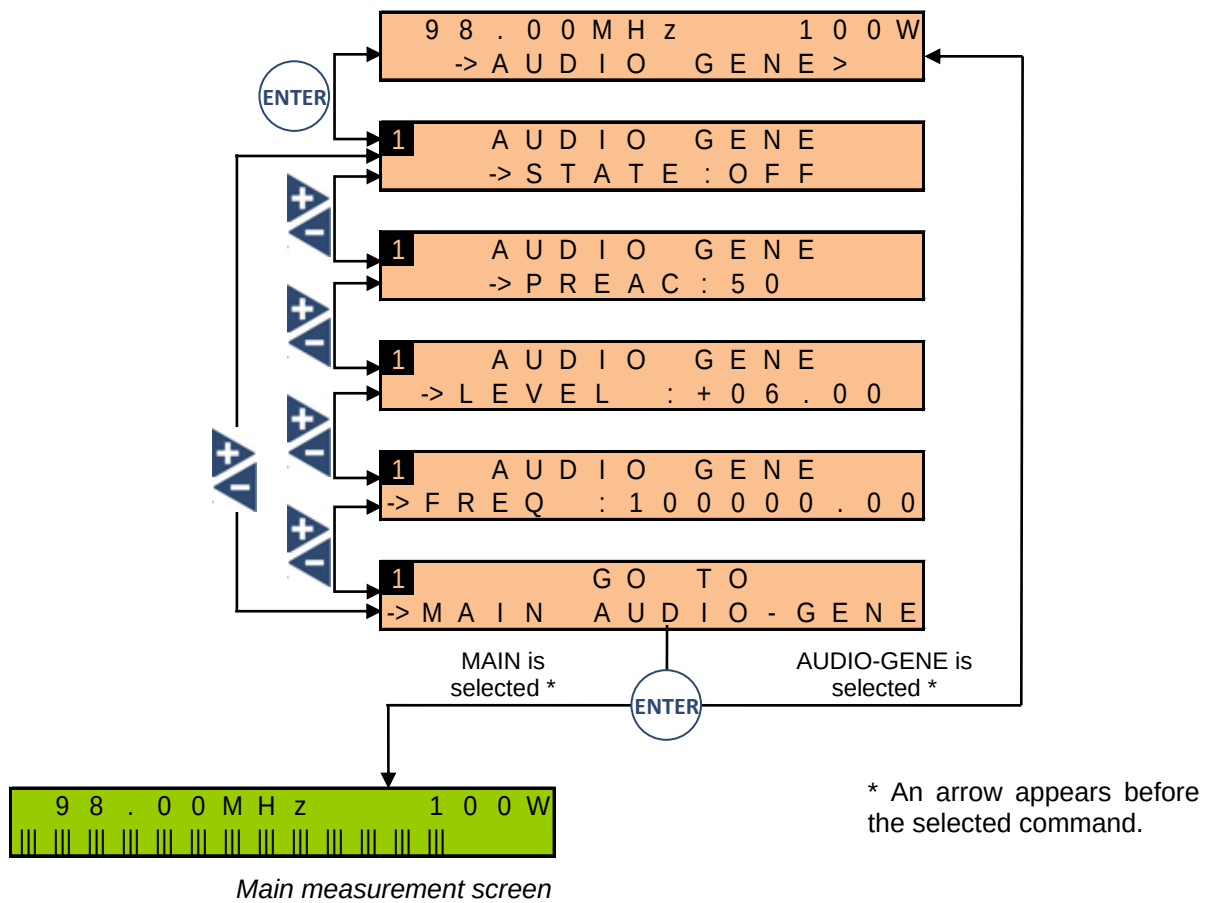
5.3.7. LINE1 Menu

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

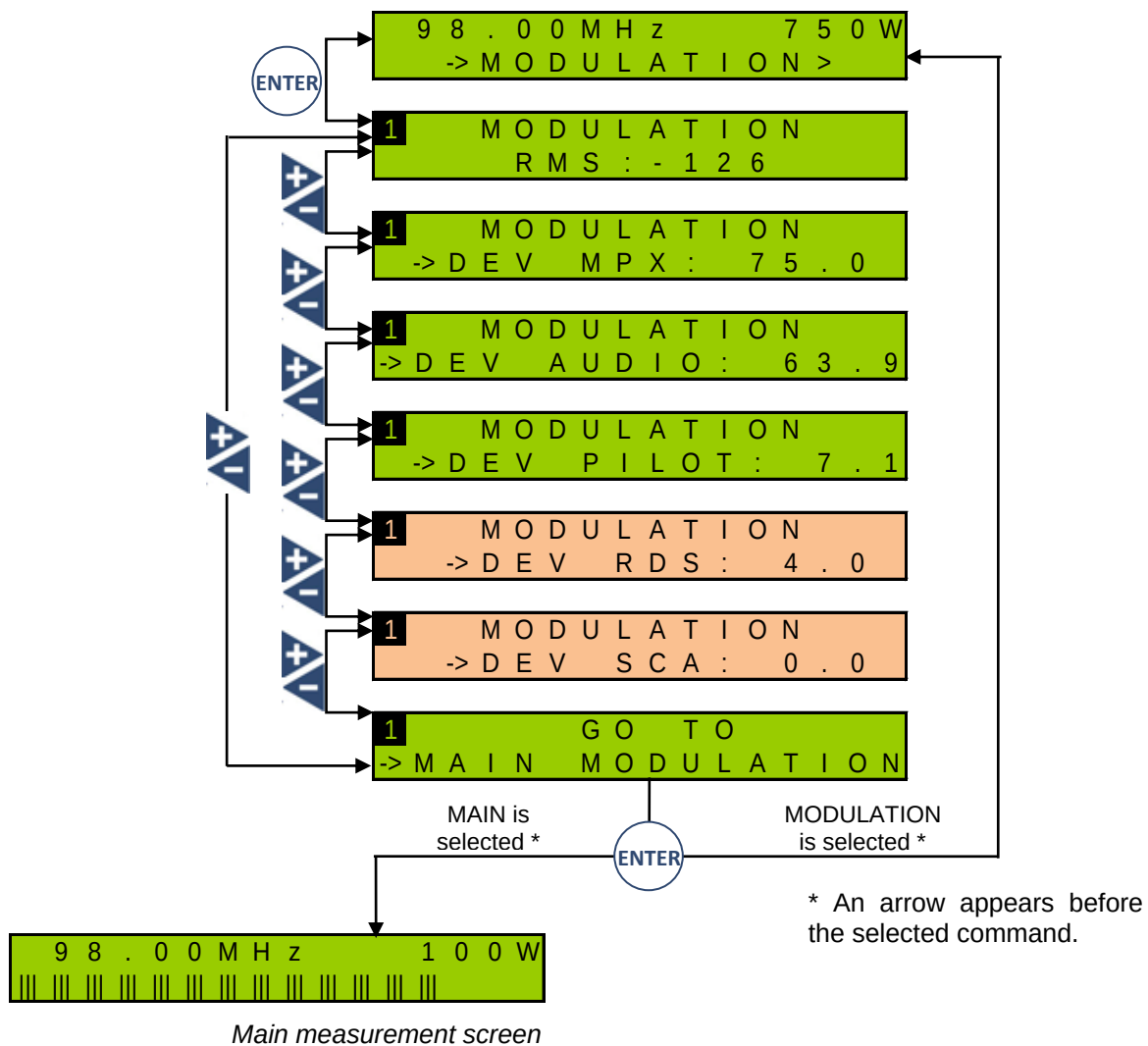


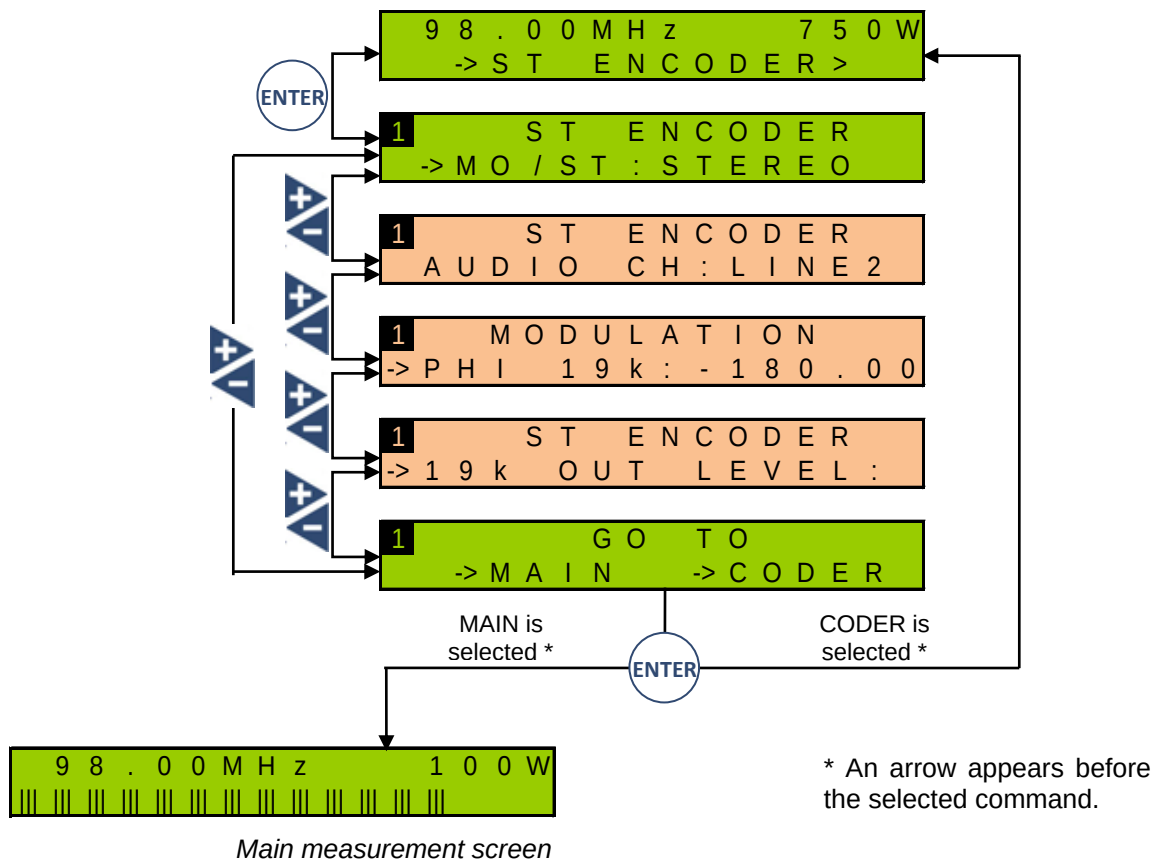
* An arrow appears before the selected command.

5.3.9. Audio Gene Menu

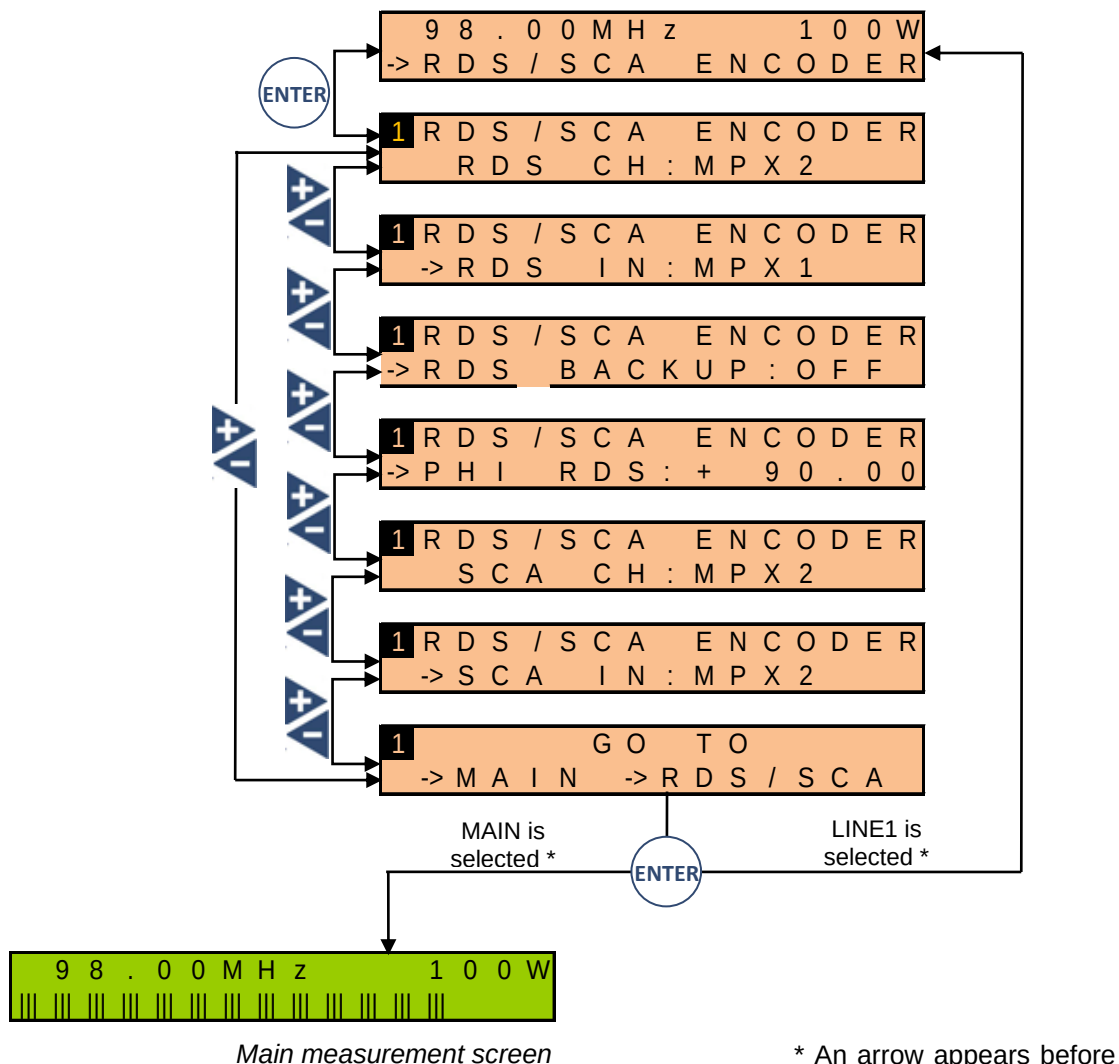


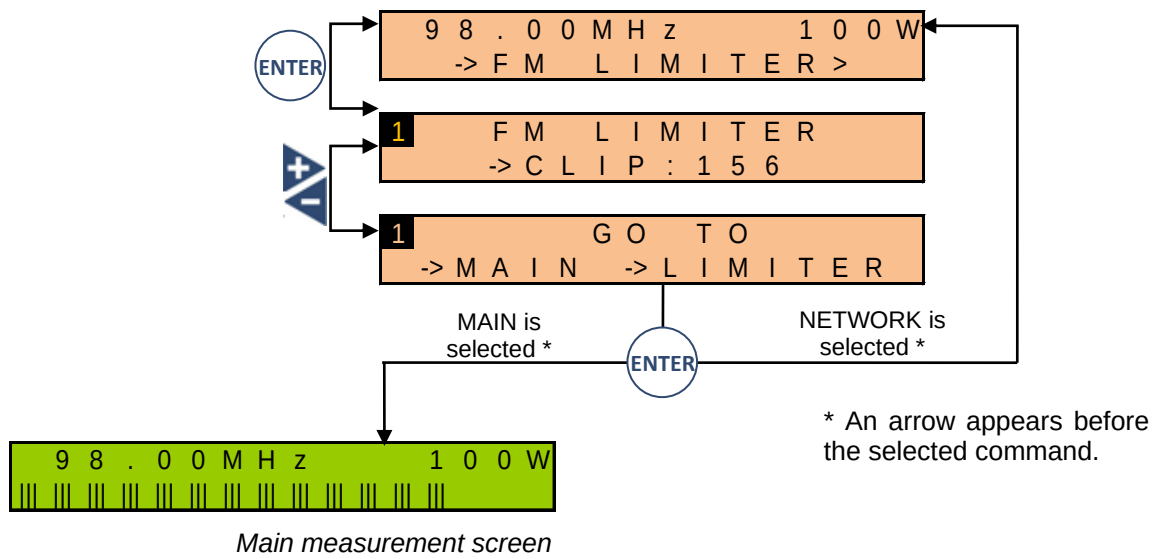
5.3.10. Modulation Menu



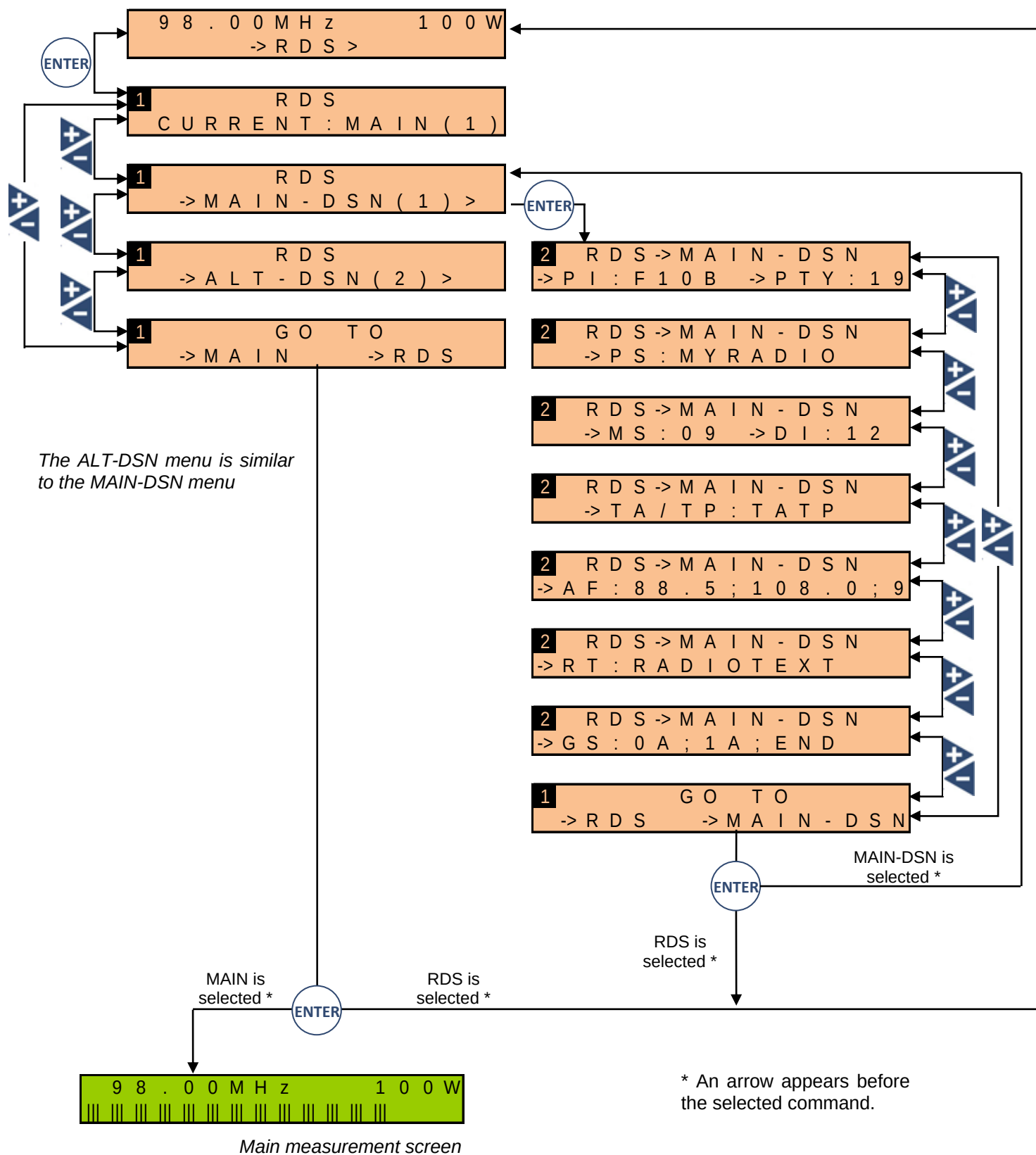


5.3.12. RDS / SCA encoder Menu

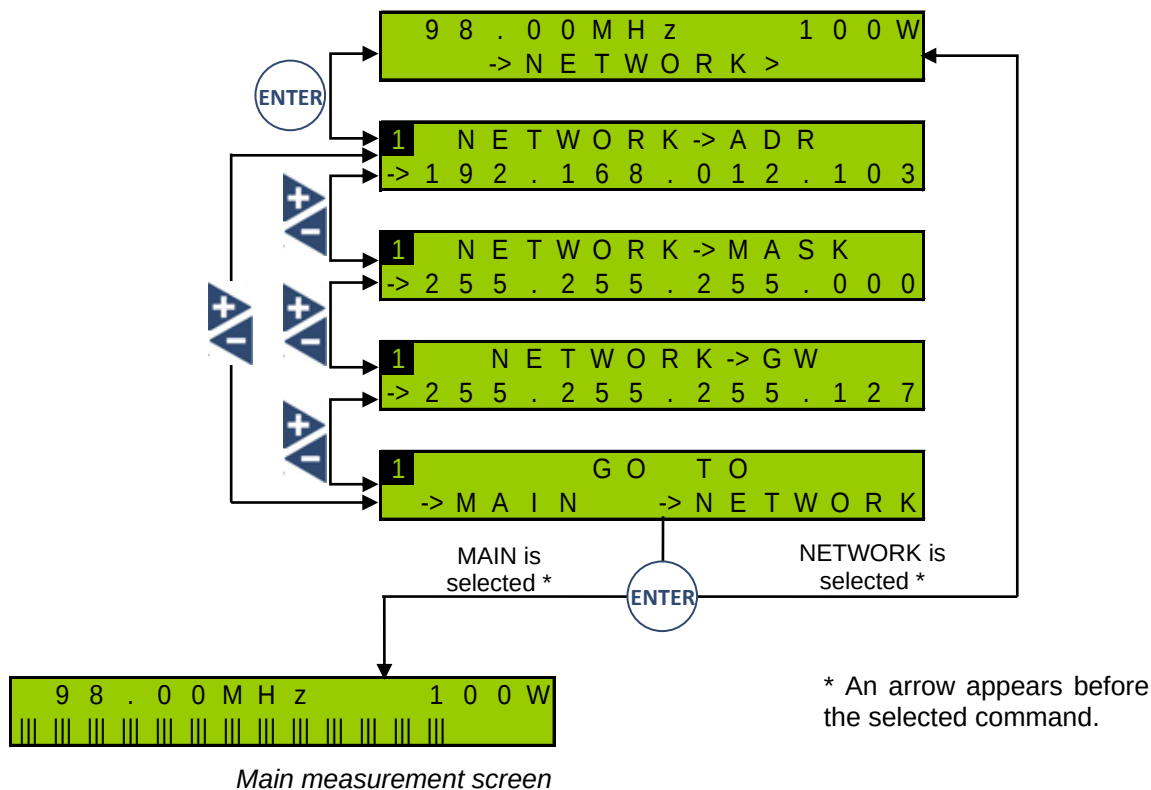




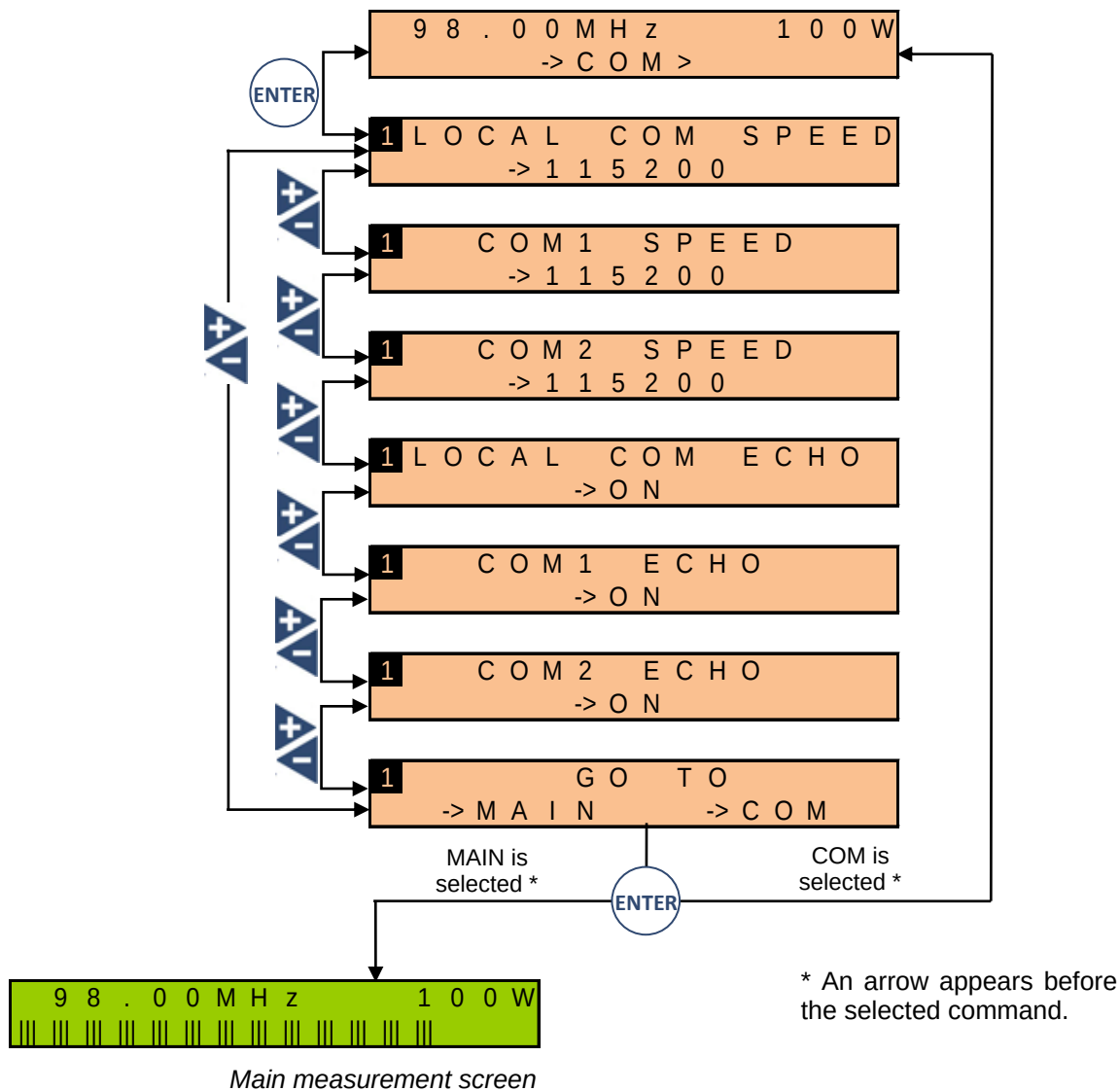
5.3.14. RDS Menu



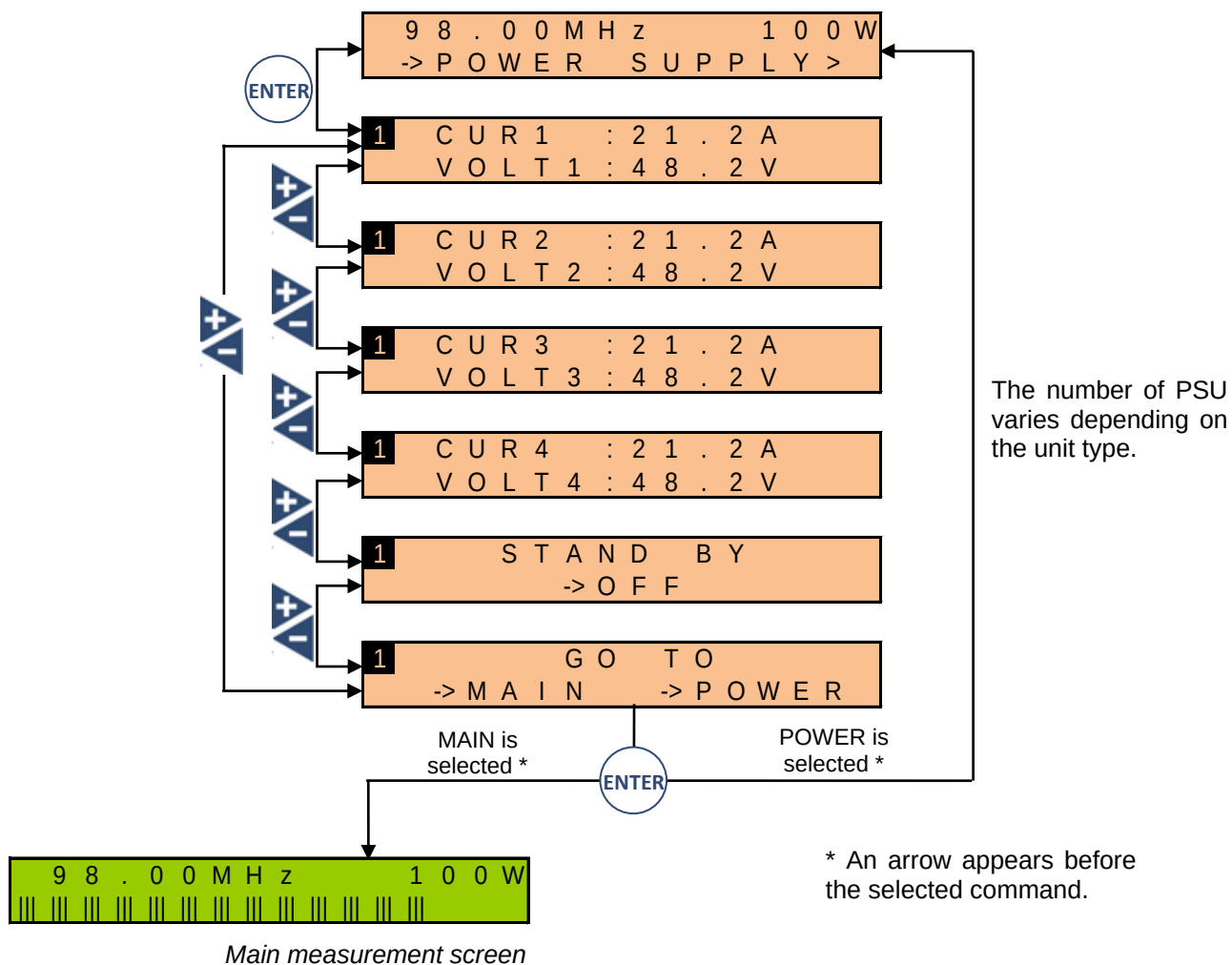
5.3.15. Network Menu



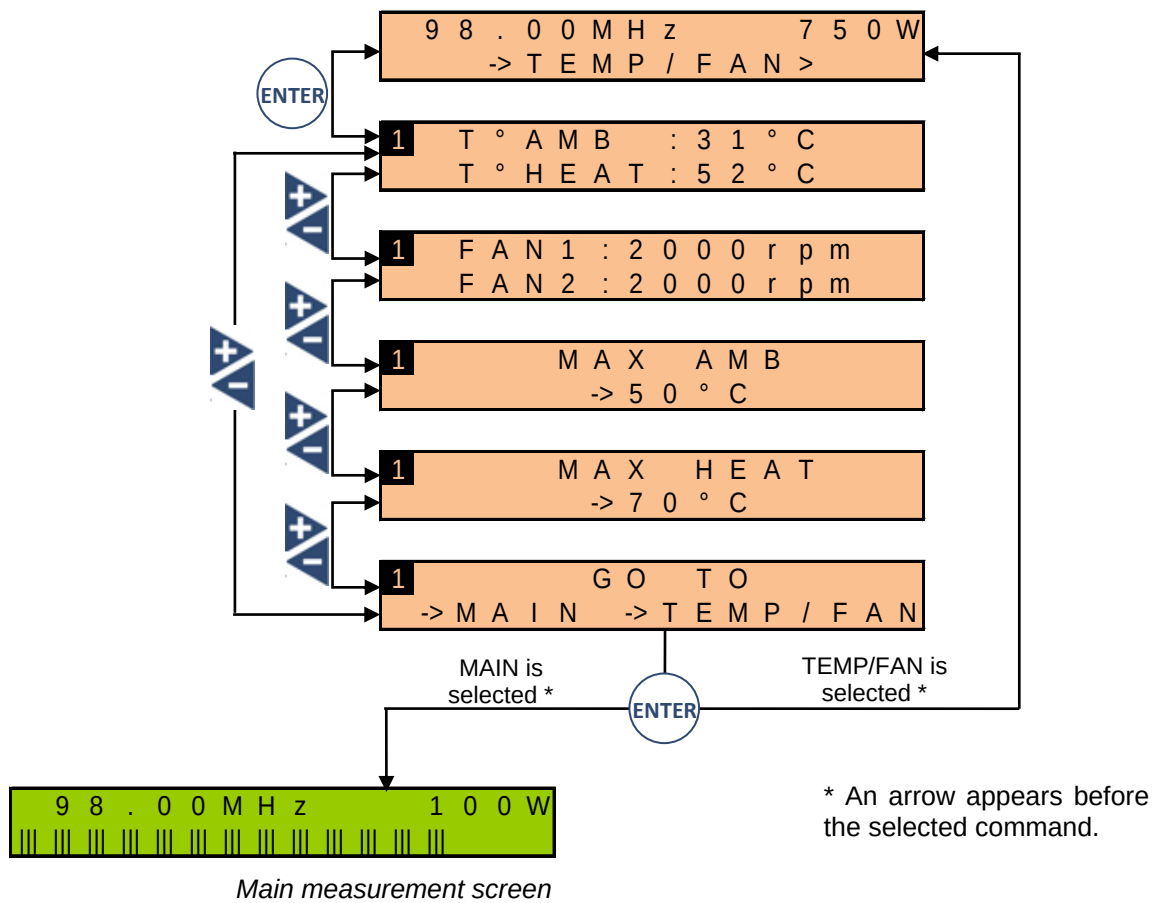
5.3.16. COM Menu

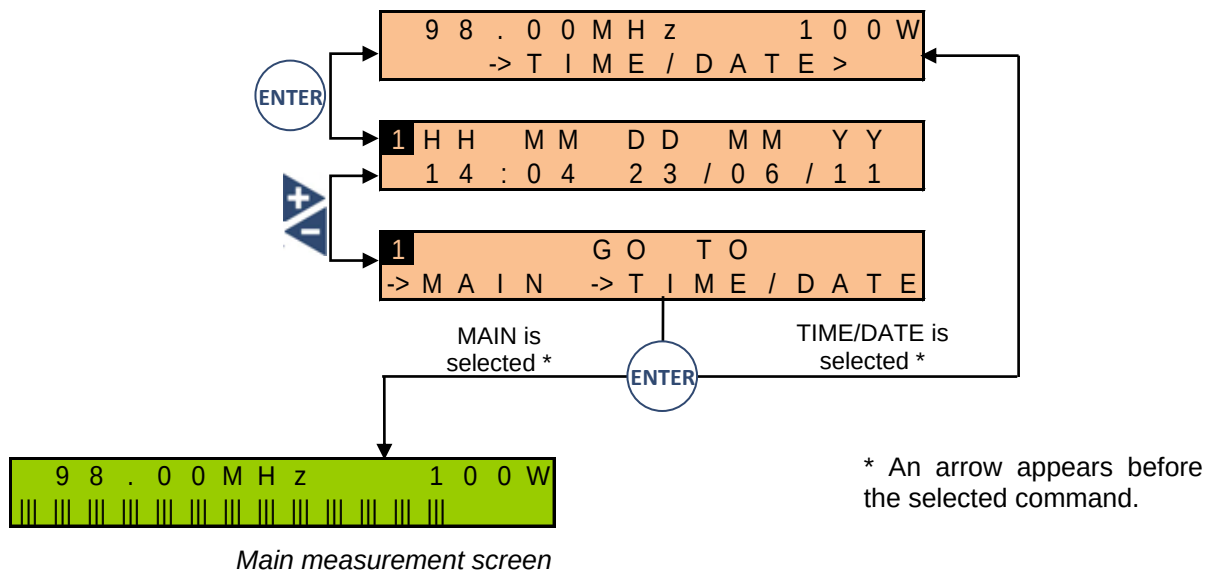


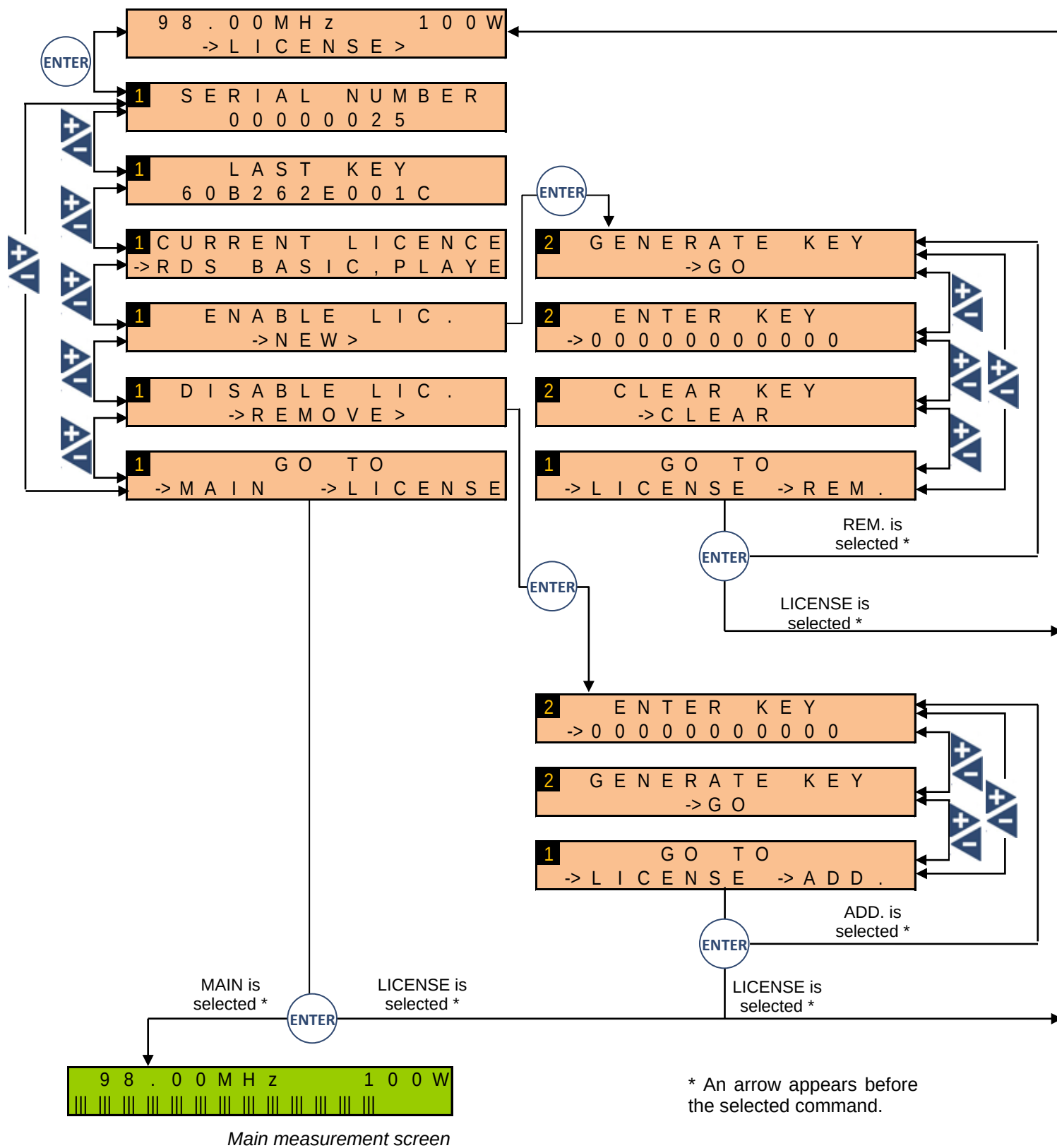
5.3.17. Power supply Menu



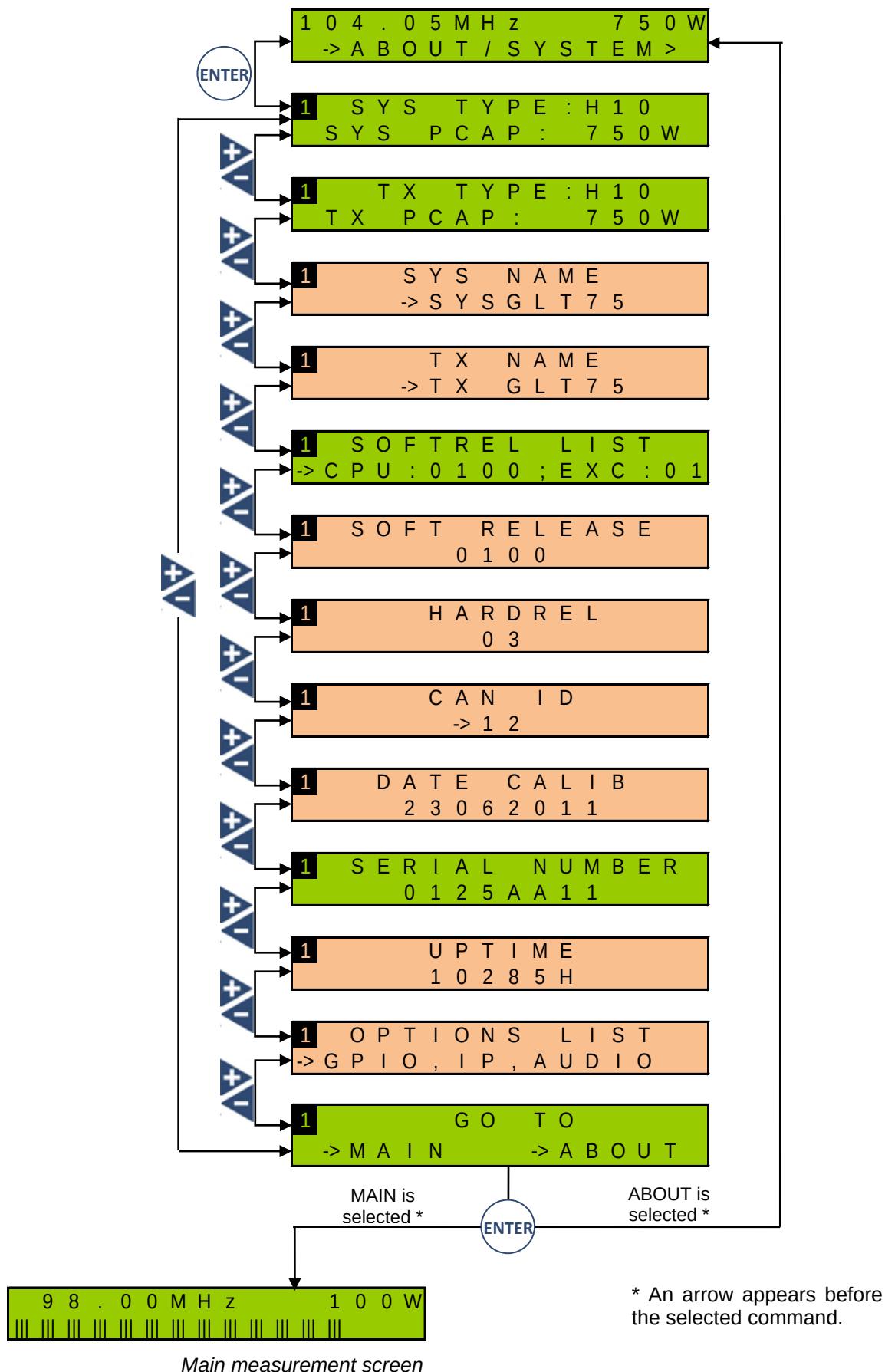
5.3.18. Temp/Fan Menu







5.3.21. About / System Menu



5.3.22. Easy/Expert Menu

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

5.3.23. Exit Menu

9 8 . 0 0 M H z 1 0 0 W
-> E X I T

ENTER

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

Main measurement screen

5.4. Main parameters description

Parameters are described for the main menus; serial commands are indicated in parenthesis. Possible values and/or value format are indicated for each parameter.

5.4.1. TX PARAMETERS Menu

These parameters are available as TX and CONF serial commands (see sections 6.2.8 and 6.2.3).

3 DB (TX.3DB)

With this parameter, set the triggering threshold for the 3 dB alarm. Default value is half the transmitter's power.

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

MAX VSWR (TX.VSWR.MAX)

With this parameter, set the triggering threshold for the VSWR alarm.

From 0 to 99.9

VSWR TRIP (TX.VSWRTRIP)

With this parameter, enable or disable the reflected power safety (ON or OFF). In case the VSWR is too high (reflected power greater than the maximum threshold), RF is disabled and automatically starts again. 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.

5.4.2. INPUT SWITCH Menu

These parameters are available as INPUT and CONF serial commands (see sections 6.2.5 and 6.2.3), but are managed differently: the PRIO parameter for each input sets the selection order for the various audio sources.

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 or GENE

BACKUP 1 / BACKUP 2 / BACKUP 3

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

LINE1, LINE2, MPX1, MPX2 ou GENE

CROSSFADE (CONF.CROSSFADE) – read/write

With this parameter, set the crossfade time between channels when switching from one to the next (in seconds).

From 0 to 25.5 s

LINE 1 or 2 / MPX / PLAYER sub menu

These parameters are available as INPUT.LINE1.SW / INPUT.LINE2.SW / INPUT.MPX.SW / INPUT.PLAYER.SW serial commands (see section 6.2.5).

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

With this parameter, set the silence threshold level in dBFS on the selected channel.

From -90 to 0 dBFS

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

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

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

From 0 to 30 s

5.4.3. Menu LINE 1 (ANA)

These parameters are available as INPUT.LINE1 serial commands (see section 6.2.5).

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

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

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

0, 50 or 75 μ s

5.4.4. LINE 2 Menu (AES)

These parameters are available as INPUT.LINE2 serial commands (see section 6.2.5).

They are identical to LINE1 menu parameters, except for the level.

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

5.4.5. MPX IN Menu**MPX1 or MPX2 Sub-menu**

These parameters are available as INPUT.MPX1 / INPUT.MPX2 serial commands (see section 6.2.5).

TYPE (INPUT.MPXn.TYPE) – read/write

This parameter applies a filter to extract the type of signal needed on the MPXn input. This filtered signal will become the MPXn channel audio signal. Note that when switching from stereo to mono, the total deviation is maintained.

MO (mono), ST (stereo), ST+R+S (stereo+RDS+SCA), ST+R (stereo+RDS), RDS, R+S (RDS+SCA), SCA or NONE

PRESENCE (INPUT.MPXn.PRESENCE) – read only

Indique la composition du signal sur l'entrée MPXn.

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

5.4.6. PLAYER Menu

These parameters are available as INPUT.PLAYER serial commands (see section 6.2.5).

They are identical to LINE2 menu parameters.

5.4.7. AUDIO GENE Menu

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

These parameters are available as INPUT.AUDIOGEN serial commands (see section 6.2.5).

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 μ s if the audio signal is pre-emphasized before getting to the transmitter. Otherwise, select according to the country: 50 μ s in Europe, 75 μ s in the USA.

0, 50 or 75 μ s

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

5.4.8. MODULATION Menu

These parameters are available as MEAS.DEV and CONF serial commands (see section 6.2.2 and 6.2.3).

RMS (MEAS.DEV.RMS) – read only

This parameter indicates the average 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.

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.

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.

From 0 to 25.5 kHz

5.4.9. STEREO ENCODER Menu

These parameters are available as CODER and CONF serial commands (see sections 6.2.6 and 6.2.3).

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 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

5.4.10. RDS / SCA ENCODER Menu

These parameters are available as CODER and serial CONF commands (see sections 6.2.6 and 6.2.3).

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.

MPX1, MPX2 or INTERNAL

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

MPX1 or MPX2

5.4.11. FM LIMITER Menu

These parameters are available as MEAS.DEV and CONF serial commands (see section 6.2.2 and 6.2.3).

CLIP (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 0, or at the maximum authorized deviation, plus a few kHz to ensure additional security with the audio processor.

From 0 to 200

5.4.12. RDS Menu

With the Basic 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.

Note: the RDS is enabled in the RDS/SCA ENCODER menu.

These parameters are available as RDS serial commands (see section 6.2.7).

CURRENT MAIN (RDS.DSN)

This parameter indicates the current DSN number.

MAIN DSN sub-menu**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

PTY (RDS.MAINDSN.PTY) – read/write

With this parameter, set the PTY (Program Type). Select on 32 RDS or RBDS 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
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	<u>M.O.R. Music</u>	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

PS (RDS.MAINDSN.PS) – read/write

With this parameter, set the PS (Program Station)

8-digit code

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)

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). The RT function cannot be used on car radios as road safety commissions have forbidden its use on board a vehicle.

GS (RDS.MAINDSN.GS) – read/write

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

XX;XX; ...;XX

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

6. SERIAL COMMANDS

6.1. Working principle

Helios FM 350 W, Helios FM 750 W, Helios FM 1000 W, Helios FM 1500 W and Helios FM 2000 W 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 + Hyper-Terminal) 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. See figure 'Port parameters'.

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

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

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.

6.2. Serial commands

6.2.1. System commands

NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
LOGIN	R/W	XXXX,X=[0...z] "LOGGED" ou "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.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.GPIO.IN.ACT	R	XX X=[A..F;0..9]	Indicates the corresponding RC when managed manually (see SYS.GPIO.IN.MASK)
SYS.GPIO.IN.MASK	R/W	XX X=[A..F;0..9]	Sets the RC control either by the control board or manually. Hexadecimal code: each bit corresponds to an input. Ex: A1 (10100001) indicates the RC 1, 6 and 8 are managed manually
SYS.GPIO.OUT.ACT	R/W	XX X=[A..F;0..9]	Enables the corresponding RM when managed manually (see SYS.GPIO.OUT.MASK)
SYS.GPIO.OUT.MASK	R/W	XX X=[A..F;0..9]	Sets the RM control either by the control board or manually. Hexadecimal code: each bit corresponds to an input: Ex: 21 (00100001) indicates RM 1 and 6 are managed manually.
SYS.HARDREL	R	xx.xx.xx x=[0..9]	Hardware version: example "3.0.1"
SYS.IP.ADR	R/W	XXX.XXX.XXX.XXX X=[0...9]	IP address of the optional IP board
SYS.IP.GW	R/W	XXX.XXX.XXX.XXX X=[0...9]	Network gateway of the optional IP board
SYS.IP.MAC	R/W	XX:XX:XX:XX:XX:XX:XX:XX X=[A..F;0..9]	Mac address of the optional IP board
SYS.IP.MASK	R/W	XXX.XXX.XXX.XXX X=[0...9]	IP mask of the optional IP board
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		
SYS.LOG.CLR	W		Clears the event list
SYS.NAME	R/W	XXXX X=[A...Z]	Equipment name
SYS.OPT.LIST	R	RF,RC,AIP,TUN,IP,COM,REC	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.PCAP	R	[0..999]	Nominal power of the unit: example "300"=>300 W
SYS.RAZ	W	"RAZ"	Reloads NVRAM default values

NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
SYS.RST	W		Reset of all parameters.
SYS.RST.CPU	W	"RST"	General reset of the μ c. Sends the return code: RST
SYS.RST.EXC	W		General reset of the exciter
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: example "G75" for Goliath 750 W
SYS.uptime	R	[0..99999999]	Indicates the number of working hours since commissioning
SYS.CIDIP	R/W	[0..31]	Unit identifier used by the IP option CAN bus
SYS.CIDUC	R/W	[0..31]	Unit identifier used by the CAN2 bus.
SYS.KEY.ADD	R/W	ADD	Generates a key to enable the specified option
SYS.KEY.REM	R/W	REM	Generates a key to disable the specified option
SYS.RST.EXCHW	W	"RST"	Material restart of the exciter card
SYS.RST.EXCSW	W	"RST"	Software restart of the exciter card

6.2.2. Measurement commands

NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
MEAS.AMB	R	$\pm$ [0..125]	Measures the ambient temperature from 0 to 125°C. "52"=>52°C.
MEAS.DEV.PEAK	R	-150,0...150,0	Gives the peak value for the signal deviation in kHz
MEAS.DEV.RMS	R	-150.0...150.0	Gives the average value for the signal deviation in kHz
MEAS.PFWD	R	[0..9999]	Measure of direct power. examples: "20" or "300" => 300 W
MEAS.PREF	R	xxx.x x=[0..9]	Measure of reflected power: "20" => 2 W
MEAS.VSWR	R	XX.X X=[0..9]	VSWR measure "01.0" or "20.0"
MEAS.VSWRTRIP		[0..99]	Gives the number of reflected power safety in the past hour

6.2.3. Configuration commands

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.AMB.MAX	R/W	[0..999]	Sets the triggering threshold for the ambient temperature alarm
CONF.CROSSFADE	R/W	0 to 25.5	Crossfade between channels (in seconds)
CONF.DEV.AUDIO	R/W	0...150	Sets the audio excursion
CONF.DEV.CLIP	R/W	0 to 200	Set the excursion clipping ; +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

NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
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.SCA	R/W	0 to 25.5	Sets the SCA excursion
CONF.FREQ	R/W	"ON" or "OFF"	Gives the exciter's working frequency in kHz
CONF.HEAT.MAX	R/W	[0..125]	Sets the triggering threshold for the radiator 1 temperature alarm
CONF.PHASE.PILOT	R/W	-180..+180	Sets the pilot phase
CONF.PHASE.RDS	R/W	-180..+180	Sets the RDS phase
CONF.VSWRTRIP	R/W	"ON" or "OFF"	Enables/disables reflected power safety

6.2.4. Alarm commands

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
ALARM.1DB	R	"ON" or "OFF"	ON => 1 dB Alarm, OFF => No alarm
ALARM.3DB	R	"ON" or "OFF"	ON => 3 dB Alarm, OFF => No alarm
ALARM.AMB	R	"ON" or "OFF"	ON => ambient alarm, OFF => No alarm.
ALARM.BATLOW	R	"ON" or "OFF"	Indicates if the NVRAM battery's level is OK
ALARM.CUR1	R	"ON" or "OFF"	Indicates the PSU 1 current is over 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
ALARM.FAULT	R	"ON" or "OFF"	ON => critical alarm OFF => No alarm (3 dB, VSWR)
ALARM.HEAT1	R	"ON" or "OFF"	ON => radiator temp alarm, OFF => No alarm.
ALARM.INPUTSWITCH	R	"ON" or "OFF"	Indicates if the current audio input corresponds to the highest priority channel
ALARM.LIST	R		Returns the list of current alarms in ASCII format
ALARM.OVDR	R	"ON" or "OFF"	Indicates whether the input power is too high (ON) or not (OFF)
ALARM.PLL	R	"ON" or "OFF"	Indicates whether the PLL is locked (OFF) or unlocked (ON)
ALARM.RDSSWITCH	R	"ON" or "OFF"	Indicates there was a RDS switch (auto mode only)
ALARM.SUPPLY1	R	"ON" or "OFF"	PSU 1 state
ALARM.TEMP1	R	"ON" or "OFF"	ON => temp alarm (thermocoupler) OFF => No alarm
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 => PSU 1 voltage is offset by more than 10% of the expected value
ALARM.VSWR	R	"ON" or "OFF"	ON => VSWR Alarm, OFF => No VSWR alarm
ALARM.WARN	R	"ON" or "OFF"	ON => Internal Alarm (warnings) OFF=> No alarm. (fan, current, voltage, power supply, temperature, radiator, ambient temp)

6.2.5. Input commands

NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
INPUT.AUDIOGEN.FREQ1	R/W	0 ~ 100000.00	delta phase = freq audio / 200000
INPUT.AUDIOGEN.FREQ2	R/W	0 ~ 100000.00	delta phase = freq audio / 200000
INPUT.AUDIOGEN.LEVEL1	R/W	-100.00 ~ 12.00	Audio level
INPUT.AUDIOGEN.LEVEL2	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.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.LEFT.PEAK	R	-100 ... 28	Gives the left audio input max peak value
INPUT.LINE1.LEFT.RMS	R	-100 ... 28	Gives the left audio input average value
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.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
INPUT.LINE1.RIGHT.RMS	R	-100 ... 28	Gives the right audio input average value
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...120]	Switching delay when loss of audio 1
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 (L,R or L+R) silence detection must be conducted for the audio input 1
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.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.LEFT.PEAK	R	-100 ... 28	Gives the left audio input max peak value
INPUT.LINE2.LEFT.RMS	R	-100 ... 28	Gives the left audio input average value
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.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
INPUT.LINE2.RIGHT.PEAK	R	-100 ... 28	Gives the right audio input max peak value
INPUT.LINE2.RIGHT.RMS	R	-100 ... 28	Gives the right audio input average value
INPUT.LINE2.SW.BACKDELAY	R/W	XXX=[0...30]	Back delay on the channel with the highest configurable priority.
INPUT.LINE2.SW.DELAY	R/W	XXX=[1...120]	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 (L,R or L+R) silence detection must be conducted for the audio input 2
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.

NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
INPUT.MPX.SW.DELAY	R/W	XXX=[1...120]	Switching delay when loss on the MPX input
INPUT.MPX.SW.THRESH	R/W	-90...000	Silence triggering level in dBFS on MPX 1
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.LEVEL	R/W	-18.00...+18.00	Internal numerical gain
INPUT.MPX1.PEAK	R	-150...150	Gives the deviation max peak value of the transmitted signal in kHz
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.RMS	R	-150...150	Gives the deviation average value of the transmitted signal in kHz
INPUT.MPX1.SW.PRIO	R/W	0..7 ; 0=disabled	Priority of each audio channel (4= highest priority)
INPUT.MPX1.TYPE	R/W	"MO" or "ST" or "ST+R+S" or "ST+R" or "RDS" or "RDS+SCA" or "SCA"	Sets the type of signal on the MPX1 input and applies the corresponding filter
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.LEVEL	R/W	-18.00...+18.00	Internal numerical gain
INPUT.MPX2.PEAK	R	-150...150	Gives the deviation max peak value of the transmitted signal in kHz
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.RMS	R	-150...150	Gives the deviation average value of the transmitted signal in kHz
INPUT.MPX2.SW.PRIO	R/W	0..7 ; 0=disabled	Priority of each audio channel (4= highest priority)
INPUT.MPX2.TYPE	R/W	"MO" or "ST" or "ST+R+S" or "ST+R" or "RDS" or "RDS+SCA" or "SCA"	Sets the type of signal on the MPX1 input and applies the corresponding filter
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;1;2 0=15;1=16;2=17	Configuration of the audio filter
INPUT.PLAYER.LEFT.PEAK	R	-100 ... 28	Gives the left audio input max peak value
INPUT.PLAYER.LEFT.RMS	R	-100 ... 28	Gives the left audio input average value
INPUT.PLAYER.LEVEL	R/W	-20...0	Internal numerical gain
INPUT.PLAYER.PREAC	R/W	0;50;75	Sets the value of the pre-emphasis
INPUT.PLAYER.PRESENCE	R	OFF or "L" or "R" or "L&R"	Indicates audio signals are present on the player
INPUT.PLAYER.RIGHT.PEAK	R	-100 ... 28	Gives the right audio input max peak value
INPUT.PLAYER.RIGHT.RMS	R	-100 ... 28	Gives the right audio input average value
INPUT.PLAYER.SAMPLING	R/W	"44" or "48" or "96"	Sampling frequency of the internal player audio signal
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...120]	Switching delay when loss of audio 1
INPUT.PLAYER.SW.PRIO	R/W	0..4 ; 0=disabled	Priority of each audio channel (7= highest priority)
INPUT.PLAYER.SW.SILENCE	R/W	"L" or "R" or "ANY" or "BOTH"	Sets on which channel (L,R or L+R) silence detection must be conducted for the audio input 1
INPUT.PLAYER.SW.THRESH	R/W	-90...000	Silence triggering level in dBFS on channel 1
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)

6.2.6. Encoder 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 "TUNER" or "MPX1" or "MPX2" or "TUNER1" or "TUNER2" or "PLAYER" or "GENE"	Indicates the channel used by the exciter.
CODER.CURRENT.RDS	R	"NONE" or "MPX1" or "MPX2" or "TUNER1" or "TUNER2" or "INTERNAL"	Indicates the channel used by the exciter.
CODER.MOST	R/W	"STEREO" or "MONO" or "MONO_L" or "MONO_R"	Configuration of the audio on MPX STEREO; MONO; MONO_L
CODER.RDS.BACKUP	R/W	"AUTO" or "MANU"	RDS is automatically or manually added on loss of RDS in MPX
CODER.SELECT.AUDIO	R/W	"AUTO" or "LINE1" or "LINE2" or "TUNER" or "MPX1" or "MPX2" or "TUNER1" or "TUNER2" or "PLAYER" or "GENE"	Imposes a specific input.
CODER.SELECT.RDS	R/W	"OFF" or "MPX1" or "MPX2" or "TUNER1" or "TUNER2" or "INTERNAL"	Channel to use, 'OFF' disables the RDS
CODER.SELECT.SCA	R/W	"OFF" or "MPX1" or "MPX2" or "TUNER1" or "TUNER2"	Channel to use, 'OFF' disables the SCA

6.2.7. RDS commands

NAME	Access (R/W)	Possible value on the serial port of the unit	Comments
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.ALTDSN.TIME	R/W		
RDS.DSN	R/W	"MAIN" or "ALT"	transmit the DSN 1 or 2 to the exciter
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)
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.MAINDSN.TIME	R/W		

6.2.8. Transmitter 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.VSWR TRIP	R/W	"ON" or "OFF"	Indicates if there has been a VSWR trip default
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
TX.NAME	R/W	XXXX X=[A...Z]	Transmitter name
TX.OPMODE	R/W	"ON" or "OFF"	Single transmitter control
TX.PCAP	R	[0..999]	Amplifier nominal power: example "300"=>300W
TX.PFWD	R	[0..9999]	Measure of direct power. examples: "20" or "300" => 300W
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" .. "9999"
TX.RFPRESENT	R	"PRES" or "NOT PRES"	Indicates if the single transmitter output power is present
TX.SBY	R/W	"ON" or "OFF"	Enables/disables the standby mode
TX.TYPE	R	xxx x=[A..Z;0..9]	System type: example "1000-NT" For a 1000 W transmitter with Nephtys central unit
TX.VSWR	R	XX.X X=[0..9]	VSWR measure "01.0" or "20.0"
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
TX.WARNING	R	"ON" or "OFF"	Single transmitter. Warning state of single transmitter

6.2.9. Status 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.ALARMS	R	XXXXXXXX x=[0,1...F]	Returns a 32 bit value indicating current alarms
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.DCOK2	R	"ON" or "OFF"	Indicates if the PSU 2 of the amplifier is "ON" or "OFF"
STAT.DCOK3	R	"ON" or "OFF"	Indicates if the PSU 3 of the amplifier is "ON" or "OFF"
STAT.DCOK4	R	"ON" or "OFF"	Indicates if the PSU 4 of the amplifier is "ON" or "OFF"
STAT.INTERLOCK.ANTENNA	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.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 is enabled
STAT.SECTEMP	R	"ON" or "OFF"	State of the temperature safety
STAT.SWRF	R	"ON" or "OFF"	State of the RF switch

6.2.10. 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.

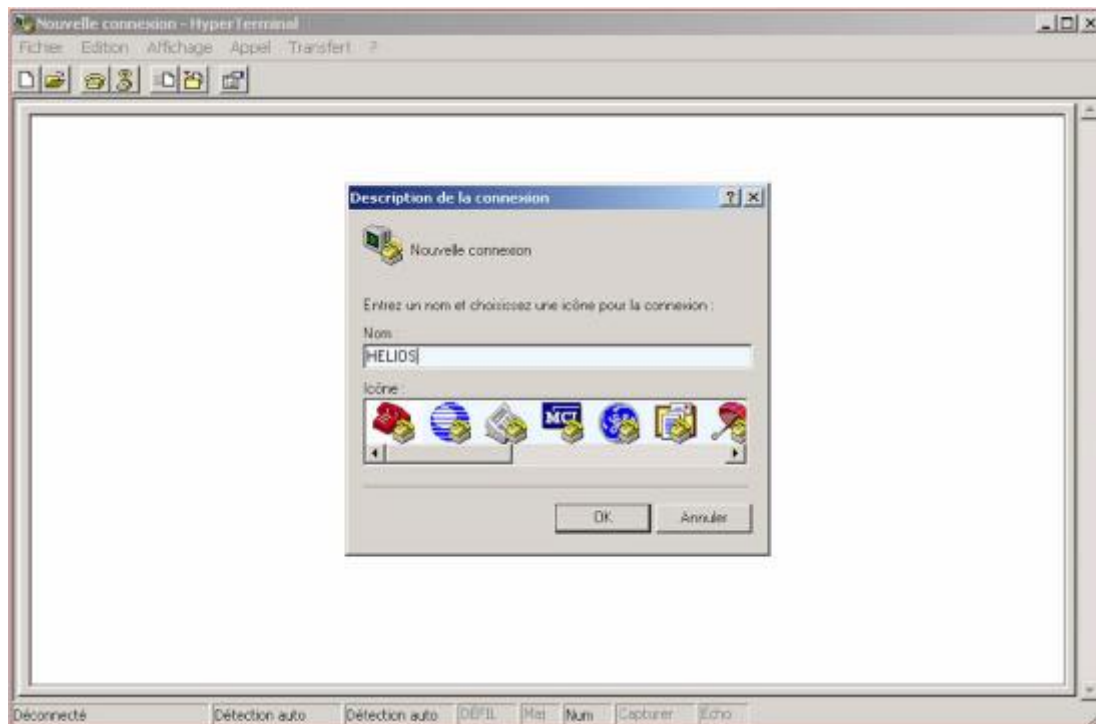
6.3. HyperTerminal connection

With Windows 95/98/2000/XP/Vista/7, launch the HyperTerminal:

Start > Programs > Accessories > Communication > HyperTerminal.

The following window appears:

Connection description

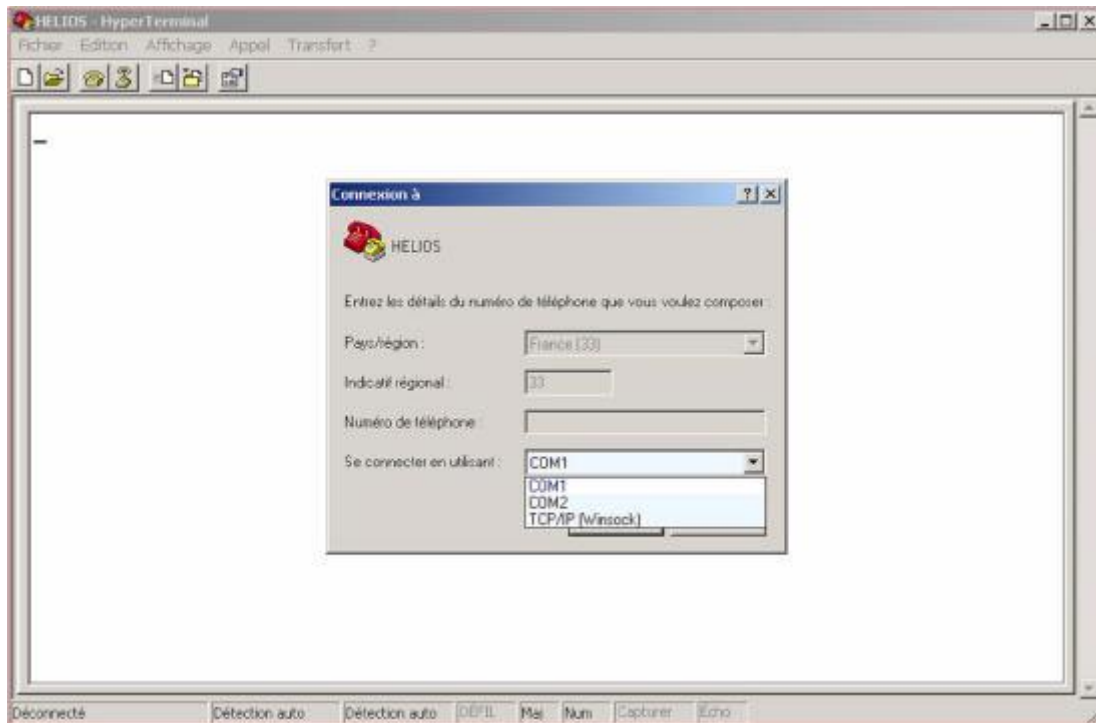


Enter the connection name and click OK.

It is recommended to enter the device name you want to contact.

The next window appears:

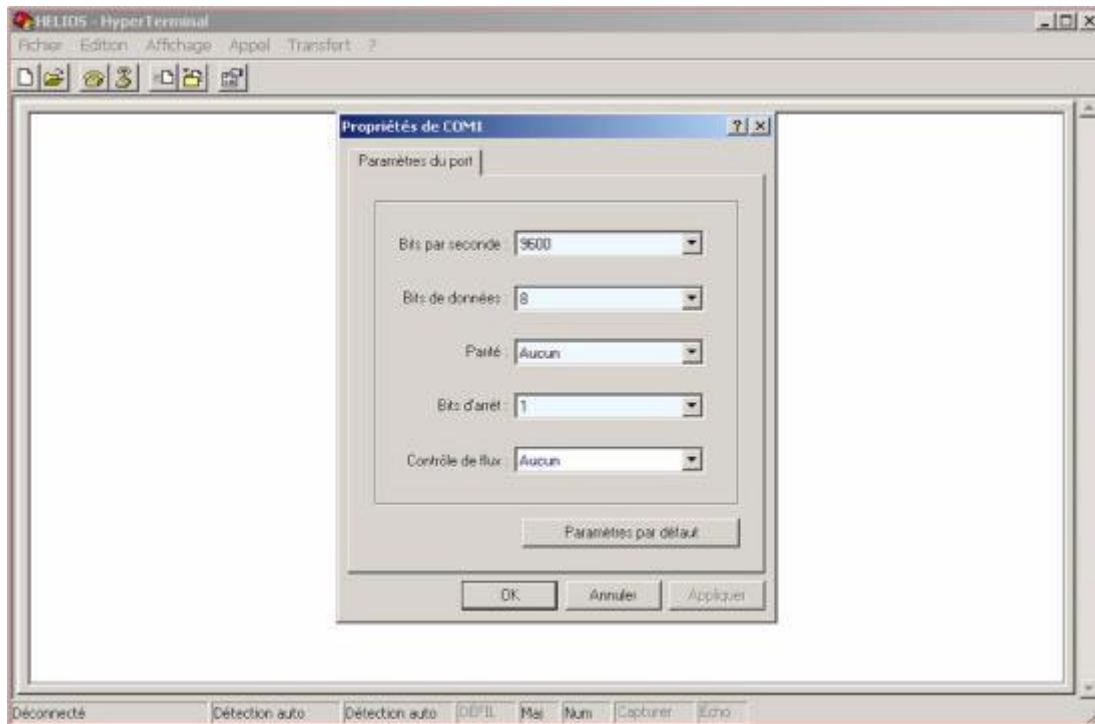
Connection



Select the serial port with which you want to connect to the equipment, then click OK.

Enter the port parameters as indicated, and click OK.

Port settings



You connection has been established, you can directly communicate with the device connected to the serial port of your computer.

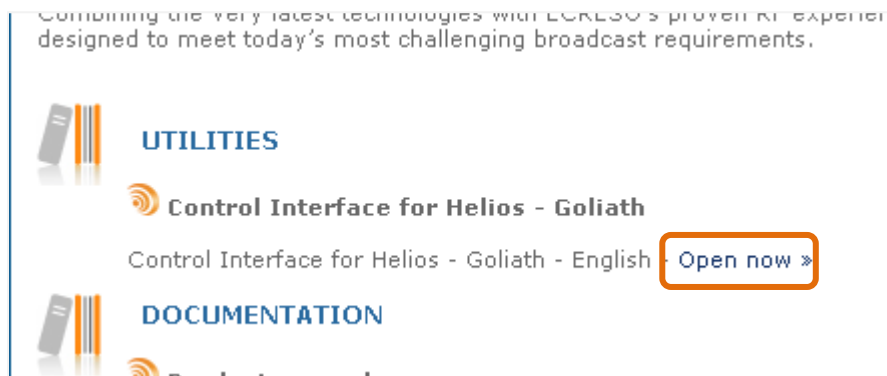
You can launch the commands described in this chapter. Typing the INFO command, the device must display the following information (connected to a Goliath in this example).

7. CONFIGURATION WITH THE PC APPLICATION

7.1. Overview

The Ecreso CD includes the Engi application which enables the transmitter's configuration with a simple serial connection to a PC.

On the transmitter's page, click the control interface link to download the zipped file to your PC.



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 Helios 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 with the IP optional board is present on the Helios, connect both the transmitter and the PC to the network.

7.2. Using the application

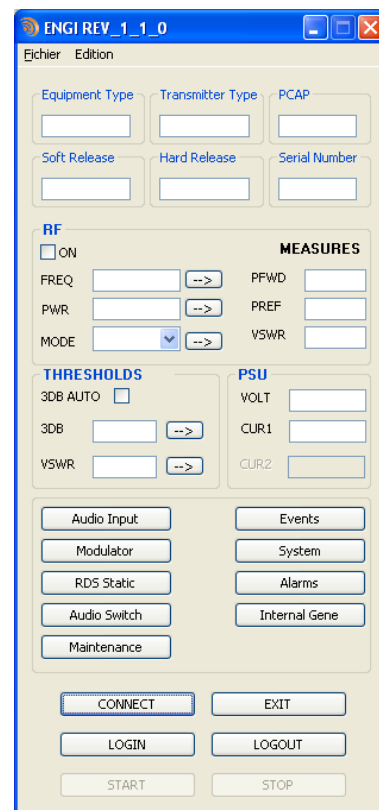
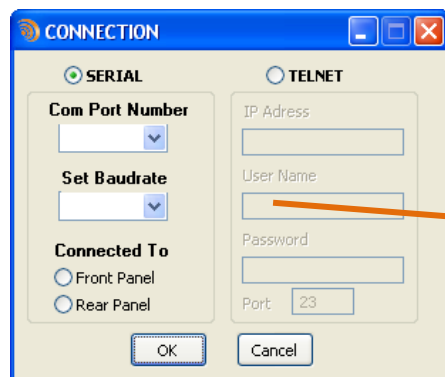
7.2.1. Connection

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.

For a remote connection, select TELNET and enter the Helios IP address, user name and password.

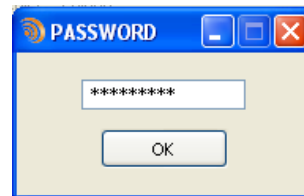
Click the "OK" button.



When connected, the unit information is automatically updated.

Equipment Type H02	Transmitter Type H02	PCAP 20
Soft Release 0111	Hard Release 01	Serial Number 00000212

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


 A small dialog box titled "PASSWORD" with a text input field containing "*****" and an "OK" button.

7.2.2. Configuration

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

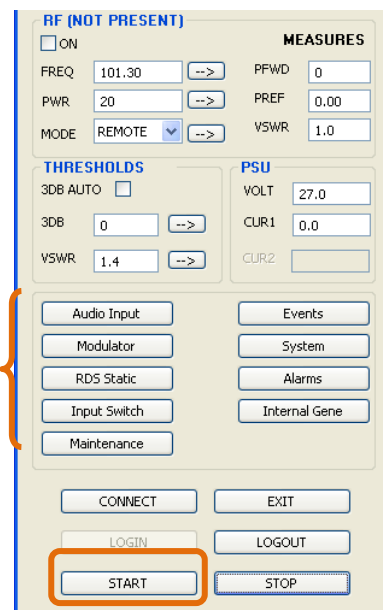
These values are also available with the TX Parameters front panel menu or with the TX and CONF serial commands.

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.

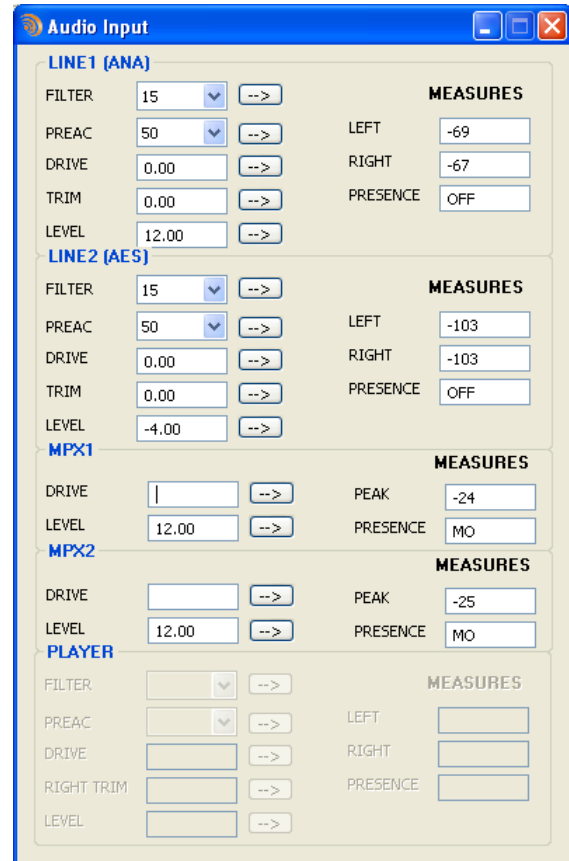
Clicking “Stop” prevents retrieval of data; however, sending data to the module remains possible.


 The main configuration window is divided into several sections:

- RF (NOT PRESENT)**: Includes checkboxes for ON, and input fields for FREQ (101.30), PWR (20), and MODE (REMOTE).
- MEASURES**: Includes input fields for PFWD (0), PREF (0.00), and VSWR (1.0).
- THRESHOLDS**: Includes checkboxes for 3DB AUTO and 3DB (0), and input fields for VSWR (1.4).
- PSU**: Includes input fields for VOLT (27.0), CUR1 (0.0), and CUR2.
- Navigation Buttons**: A grid of buttons including Audio Input, Modulator, RDS Static, Input Switch, Maintenance, Events, System, Alarms, and Internal Gene.
- Control Buttons**: CONNECT, EXIT, LOGIN, LOGOUT, START (highlighted with an orange box), and STOP.

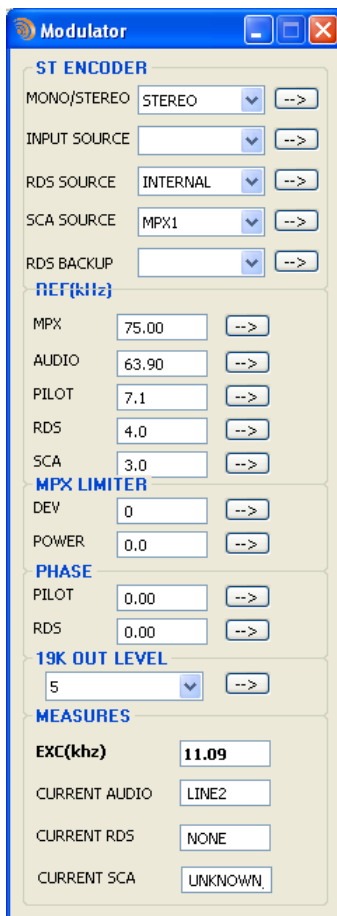
Audio input:

These values are also available with the Line 1, Line 2, MPX and Player front panel menus or with the INPUT.LINE1, INPUT.LINE2, INPUT.MPX1, INPUT.MPX2 and INPUT.PLAYER serial commands



Audio Input

LINE1 (ANA)		MEASURES	
FILTER	15	LEFT	-69
PREAC	50	RIGHT	-67
DRIVE	0.00	PRESENCE	OFF
TRIM	0.00		
LEVEL	12.00		
LINE2 (AES)		MEASURES	
FILTER	15	LEFT	-103
PREAC	50	RIGHT	-103
DRIVE	0.00	PRESENCE	OFF
TRIM	0.00		
LEVEL	-4.00		
MPX1		MEASURES	
DRIVE	1	PEAK	-24
LEVEL	12.00	PRESENCE	MO
MPX2		MEASURES	
DRIVE		PEAK	-25
LEVEL	12.00	PRESENCE	MO
PLAYER		MEASURES	
FILTER		LEFT	
PREAC		RIGHT	
DRIVE		PRESENCE	
RIGHT TRIM			
LEVEL			



Modulator

ST ENCODER

MONO/STEREO: STEREO

INPUT SOURCE:

RDS SOURCE: INTERNAL

SCA SOURCE: MPX1

RDS BACKUP:

RF(kHz)

MPX: 75.00

AUDIO: 63.90

PILOT: 7.1

RDS: 4.0

SCA: 3.0

MPX LIMITER

DEV: 0

POWER: 0.0

PHASE

PILOT: 0.00

RDS: 0.00

19K OUT LEVEL

5

MEASURES

EXC(kHz): 11.09

CURRENT AUDIO: LINE2

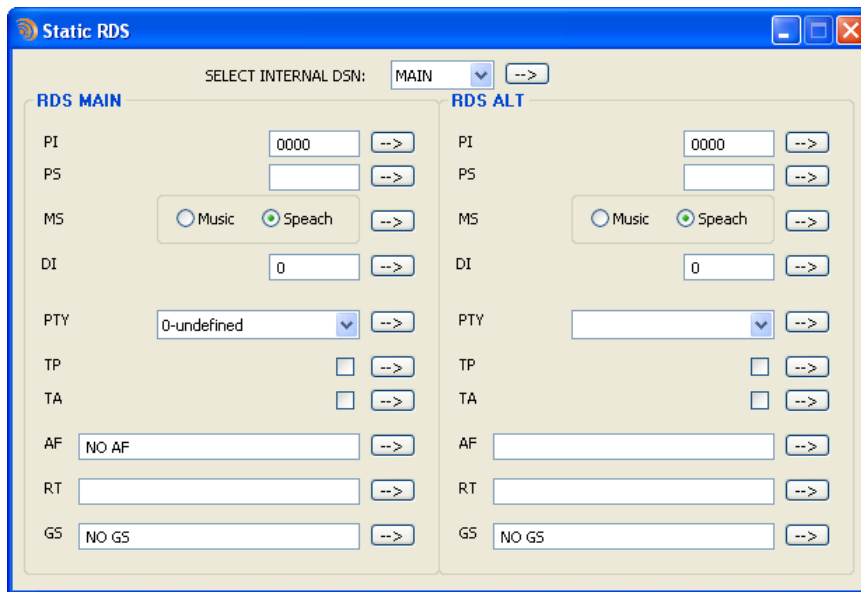
CURRENT RDS: NONE

CURRENT SCA: UNKNOWN

Modulator:

These values are also available with the Modulation front panel menu or with the MEAS.DEV and CONF serial commands.

Static RDS:

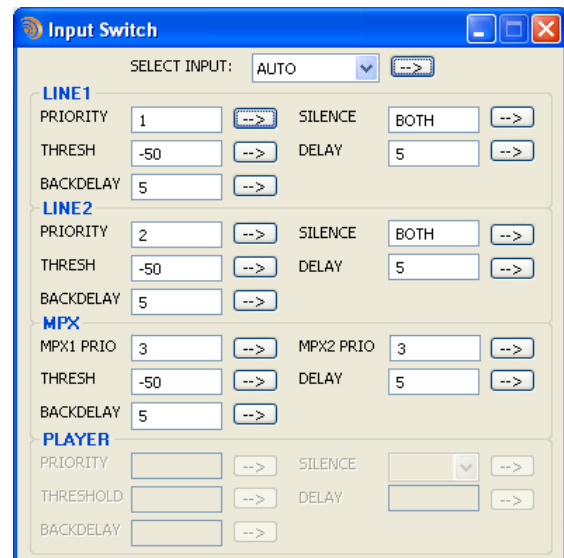


The Static RDS window is divided into two main sections: RDS MAIN and RDS ALT. At the top, there is a dropdown menu for 'SELECT INTERNAL DSN:' with 'MAIN' selected. The RDS MAIN section contains fields for PI (0000), PS, MS (Music/Speech radio buttons), DI (0), PTY (0-undefined), TP, TA, AF (NO AF), RT, and GS (NO GS). The RDS ALT section contains identical fields for PI, PS, MS, DI, PTY, TP, TA, AF, RT, and GS.

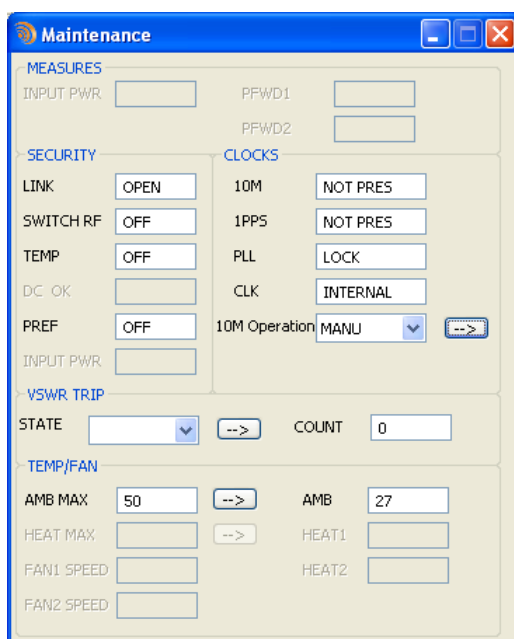
These values are also available with the RDS front panel menu or with the RDS serial commands.

Input Switch:

These values are also available with the Select and Input Switch front panel menus or with the INPUT and CONF serial commands.



The Input Switch window features a 'SELECT INPUT:' dropdown menu set to 'AUTO'. It is organized into four sections: LINE1, LINE2, MPX, and PLAYER. Each section has fields for PRIORITY, THRESH, BACKDELAY, SILENCE, and DELAY. LINE1 and LINE2 have values of 1, -50, 5, BOTH, and 5 respectively. MPX has values of 3, -50, 5, 3, and 5. The PLAYER section has empty fields for PRIORITY, THRESHOLD, BACKDELAY, SILENCE, and DELAY.



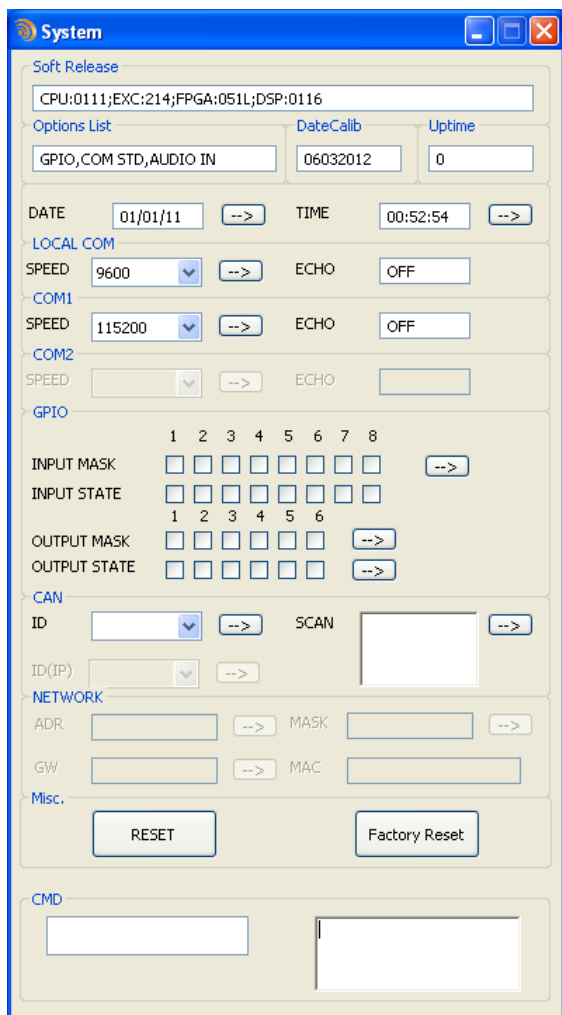
The Maintenance window is divided into several sections: MEASURES (INPUT PWR, PFWD1, PFWD2), SECURITY (LINK, SWITCH RF, TEMP, DC OK, PREF), CLOCKS (10M, 1PPS, PLL, CLK, 10M Operation), VSWR TRIP (STATE, COUNT), and TEMP/FAN (AMB MAX, AMB, HEAT MAX, HEAT1, HEAT2, FAN1 SPEED, FAN2 SPEED). The 10M Operation dropdown is set to 'MANU'.

Maintenance:

These values are also available with the TX Parameters and Temperature/Fan front panel menus or with the STATUS, TX, MEAS and CONF serial commands.

Events:

Logs are also available with **SYS.LOG** serial commands.



System

Soft Release
 CPU:0111;EXC:214;FPGA:051L;DSP:0116

Options List
 GPIO, COM STD, AUDIO IN

DateCalib
 06032012

Uptime
 0

DATE 01/01/11 --> TIME 00:52:54 -->

LOCAL COM
 SPEED 9600 --> ECHO OFF

COM1
 SPEED 115200 --> ECHO OFF

COM2
 SPEED --> ECHO -->

GPIO

	1	2	3	4	5	6	7	8
INPUT MASK	☐	☐	☐	☐	☐	☐	☐	☐
INPUT STATE	☐	☐	☐	☐	☐	☐	☐	☐
OUTPUT MASK	☐	☐	☐	☐	☐	☐	☐	☐
OUTPUT STATE	☐	☐	☐	☐	☐	☐	☐	☐

CAN
 ID --> SCAN -->

ID(IP) -->

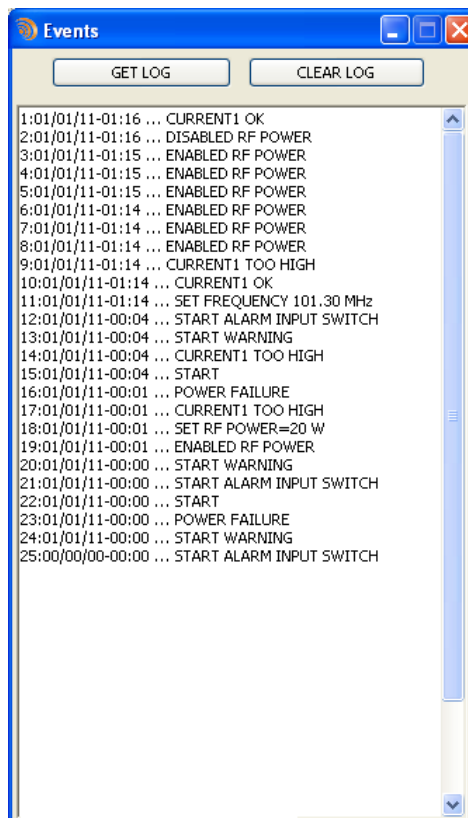
NETWORK
 ADR --> MASK -->
 GW --> MAC -->

Misc.
 RESET Factory Reset

CMD

Alarms:

These values are also available with the **Alarms** front panel menu or with the **ALARM** serial commands.



Events

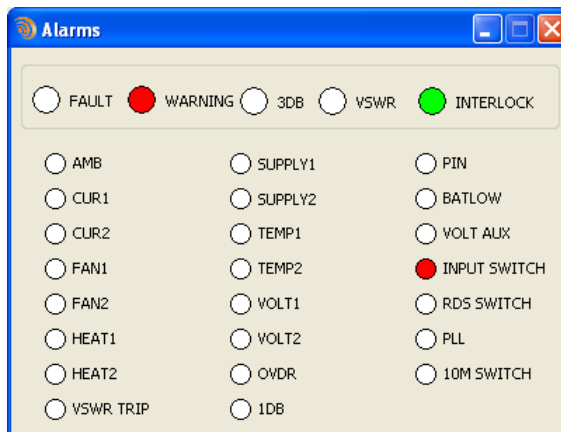
GET LOG CLEAR LOG

```

1:01/01/11-01:16 ... CURRENT1 OK
2:01/01/11-01:16 ... DISABLED RF POWER
3:01/01/11-01:15 ... ENABLED RF POWER
4:01/01/11-01:15 ... ENABLED RF POWER
5:01/01/11-01:15 ... ENABLED RF POWER
6:01/01/11-01:14 ... ENABLED RF POWER
7:01/01/11-01:14 ... ENABLED RF POWER
8:01/01/11-01:14 ... ENABLED RF POWER
9:01/01/11-01:14 ... CURRENT1 TOO HIGH
10:01/01/11-01:14 ... CURRENT1 OK
11:01/01/11-01:14 ... SET FREQUENCY 101.30 MHz
12:01/01/11-00:04 ... START ALARM INPUT SWITCH
13:01/01/11-00:04 ... START WARNING
14:01/01/11-00:04 ... CURRENT1 TOO HIGH
15:01/01/11-00:04 ... START
16:01/01/11-00:01 ... POWER FAILURE
17:01/01/11-00:01 ... CURRENT1 TOO HIGH
18:01/01/11-00:01 ... SET RF POWER=20 W
19:01/01/11-00:01 ... ENABLED RF POWER
20:01/01/11-00:00 ... START WARNING
21:01/01/11-00:00 ... START ALARM INPUT SWITCH
22:01/01/11-00:00 ... START
23:01/01/11-00:00 ... POWER FAILURE
24:01/01/11-00:00 ... START WARNING
25:00/00/00-00:00 ... START ALARM INPUT SWITCH
  
```

System:

These values are also available with the **COM Port**, **Time/Date** and **System** front panel menus or with the **SYS** serial commands.

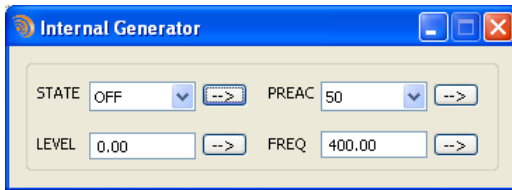


Alarms

☐ FAULT
 ☒ WARNING
 ☐ 3DB
 ☐ VSWR
 ☒ INTERLOCK

☐ AMB	☐ SUPPLY1	☐ PIN
☐ CUR1	☐ SUPPLY2	☐ BATLOW
☐ CUR2	☐ TEMP1	☐ VOLT AUX
☐ FAN1	☐ TEMP2	☒ INPUT SWITCH
☐ FAN2	☐ VOLT1	☐ RDS SWITCH
☐ HEAT1	☐ VOLT2	☐ PLL
☐ HEAT2	☐ OVDR	☐ 10M SWITCH
☐ VSWR. TRIP	☐ 1DB	

Internal Generator:



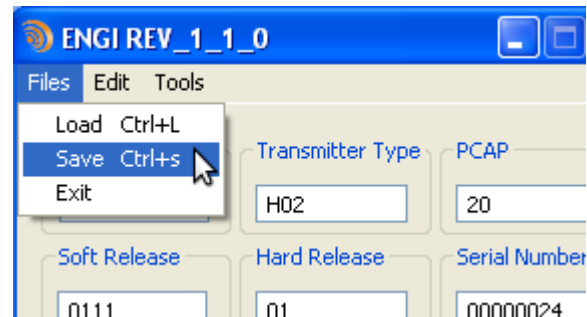
These values are also available with the Audio Generator front panel menu or with the INPUT.AUDIOGEN serial commands.

7.2.3. 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.



8. REMOTE CONTROL AND MONITORING WITH THE GPIO BOARD

8.1. Introduction

This function is available when the optional 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.

8.2. Description of control and monitoring functions

Control commands work when an impulsion longer than 100 ms is sent to the corresponding input.

There are 8 control functions:

- Standby off: turns on the transmitter
- Standby on: 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)

Outputs are relays that include a normally closed or normally open contact. When an event occurs in the unit, the corresponding relay is activated.

Six monitoring functions are associated with relays:

- Local: indicates if the unit is in local mode
- Default: indicates a transmitter default
- 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

8.3. Remote control function pinout

Function	Remote Control	Input name	Common
STANDBY OFF	RC1	OPT1A(20)	RC_COMMUN(24)
STANDBY ON	RC2	OPT2A(8)	RC_COMMUN(24)
RF ON	RC3	CONF1(21)	RC_COMMUN(24)
RF OFF	RC4	CONF2(9)	RC_COMMUN(24)
TA ON	RC5	CONF3(22)	RC_COMMUN(24)
TA OFF	RC6	CONF4(10)	RC_COMMUN(24)
DSN MAIN	RC7	CONF5(23)	RC_COMMUN(24)
DSN ALT	RC8	CONF6(11)	RC_COMMUN(24)

Numbers in parenthesis indicated the pin number on the DB25 connector.

8.4. Remote monitoring function pinout

Event	Remote Monitoring	Output name	Common
LOCAL	RM1	REL_1RT	REL1_C(14)
FAULT	RM2	REL2_RT	REL2_C(15)
WARNING	RM3	REL3_RT	REL3_C(16)
RF (ON/OFF)	RM4	REL4_RT	REL4_C(17)
ON	RM5	REL5_T	REL5_C(6)
OFF	RM6	REL5_R	REL5_C(6)
VSWR	RM7	REL6_RT	REL6_C(7)

Numbers in parenthesis indicated the pin number on the DB25 connector.

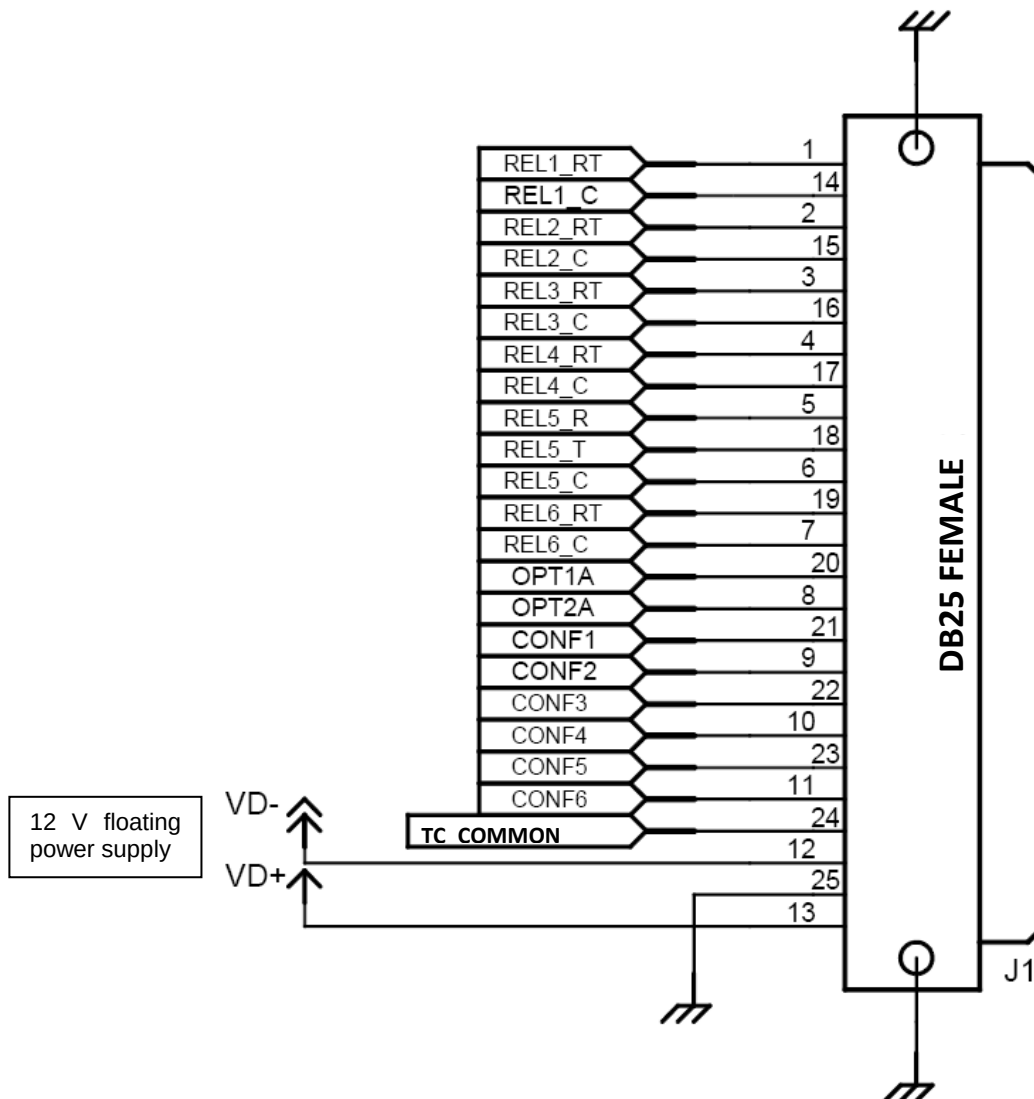
A closed link indicates valid information when configuration is as in the following table.

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.

8.5. Physical representation of the GPIOs



8.6. Management using serial commands

A set of commands makes it possible to override the control board to modify specific RC outputs and read specific RM 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 managed manually (see SYS.GPIO.IN.MASK)
SYS.GPIO.OUT.ACT	R/W	XX X=[A..F;0..9]	Enables the corresponding RM when managed manually (see SYS.GPIO.OUT.MASK)
SYS.GPIO.IN.MASK	R/W	XX X=[A..F;0..9]	Sets the RC control either by the control board or manually. Hexadecimal code: each bit corresponds to an input. Ex: A1 (10100001) indicates the RC 1, 6 and 8 are managed manually
SYS.GPIO.OUT.MASK	R/W	XX X=[A..F;0..9]	Sets the RM control either by the control board or manually. Hexadecimal code: each bit corresponds to an input. Ex: 21 (00100001) indicates RM 1 and 6 are managed manually.

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
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
```

9. THE EMBEDDED WEBSITE

9.1. Introduction

This function is available with the IP/IO version when the optional TCP/IP board is installed on the transmitter.

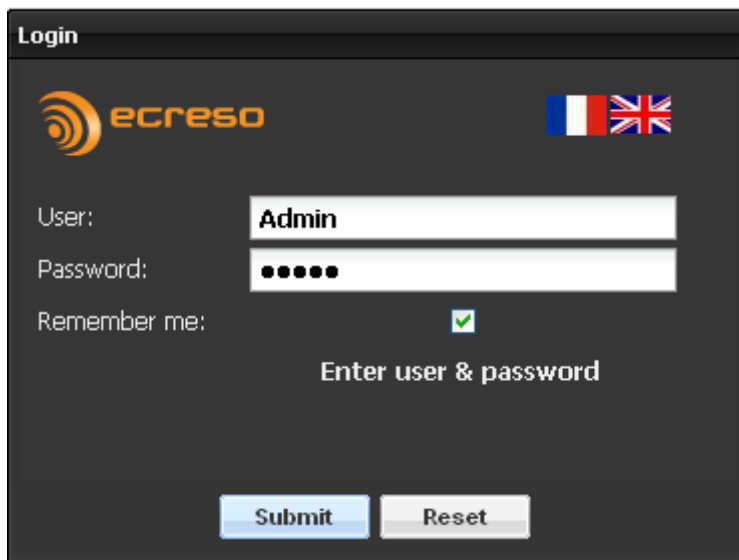
9.2. Connecting to the embedded web site

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 (default: **192.168.12.103**).

i Though the web application is compatible with most browsers, performances vary greatly from one browser to another. For this reason, we recommend you use Google Chrome, Mozilla Firefox or install the Chrome Frame plug-in for Microsoft Internet Explorer

Select the language if necessary.

Enter the user name and password:



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.



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 and system configuration.

Data can be both viewed and modified.

The indicator on the right enables all connected users to know about current notifications:

-  No current notification
-  A notification has been sent
-  A notification has been processed

9.3. Viewing the Status

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



Egreso FM Transmitter 192.168.16.220

Save Status Conf. System About

Status

Transmitter		Alarms	
Name:	NONE	Fault:	
Frequency (MHz):	98.00	Warning:	
Forward power (W):	0	3dB Alarm:	
Reflected power (W):	0.0	VSWR:	
Power setting (W):	10	Input Switch:	
VSWR:	1.0		

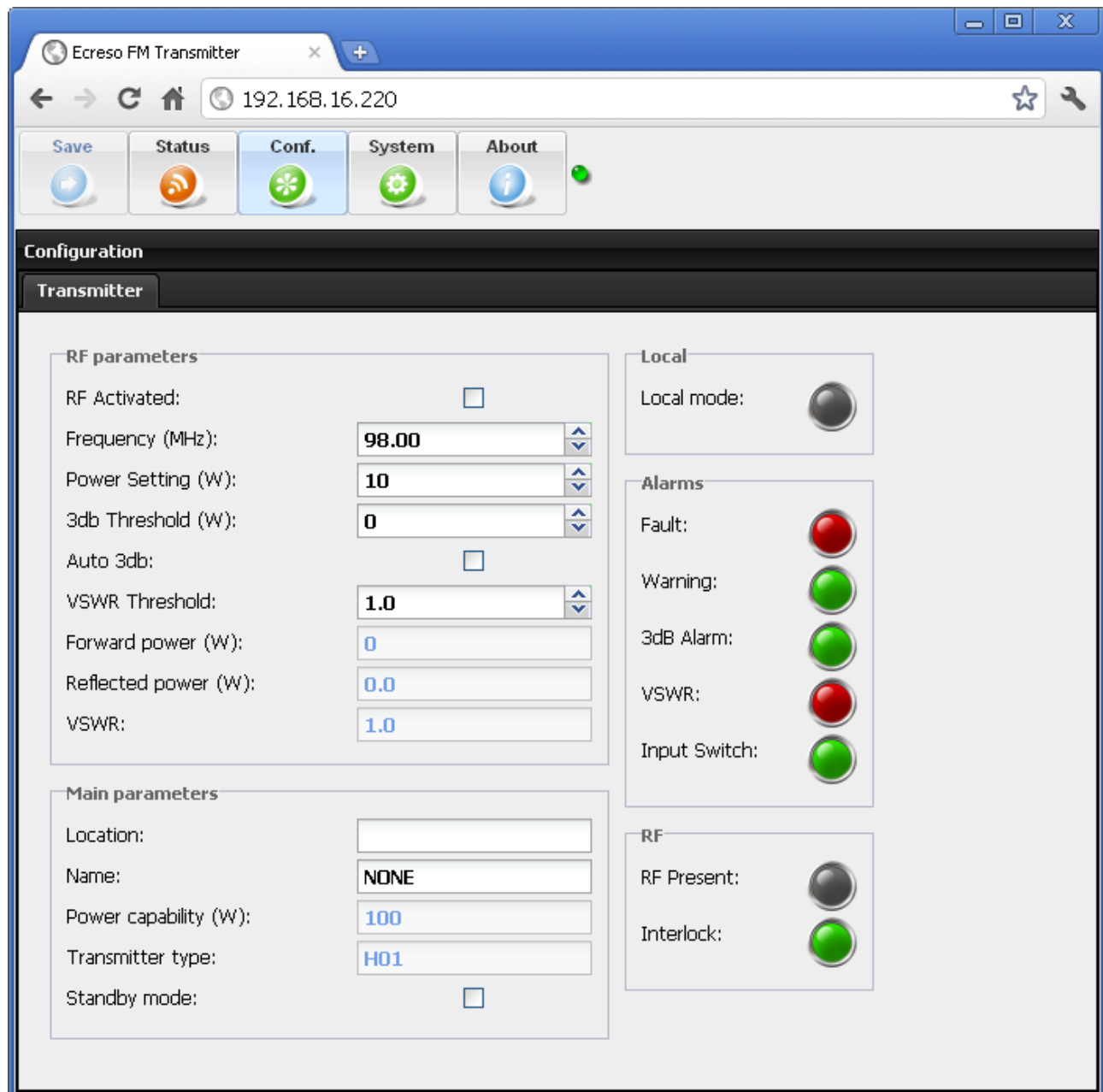
Measurements		RF	
Peak Deviation (kHz):	7.1	Standby:	
Coder:	Stereo	RF Present:	
Current Audio:	Line2	RF Activated:	
Current RDS:	None	Interlock:	
RDS Operation:	Auto		

LEDs give the status of the alarms:

-  No alarm
-  Alarm
-  Unknown status, or element not monitored

9.4. Configuration

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




When values have been changed, click the button  to save the new settings.

If the transmitter is in local mode (green LED), check the Local LED before making changes or you may not be able to save:

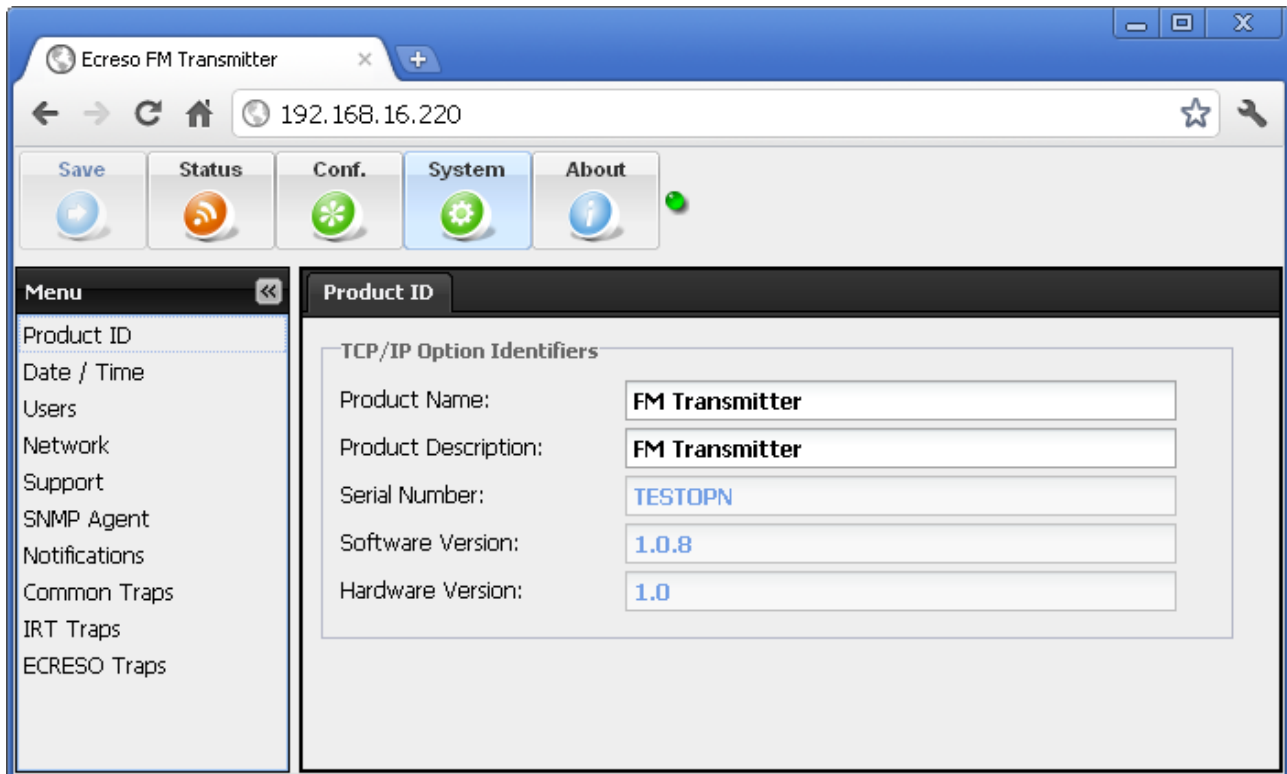
-  Local mode, modifications cannot be saved.
-  Standard mode, modifications can be saved.

9.5. System



i Click the Save button to lock in your changes; this is true for every page of the system configuration.

9.5.1. Product ID



The screenshot shows a web browser window titled "Ecreso FM Transmitter" with the address bar displaying "192.168.16.220". The interface has a top navigation bar with buttons for "Save", "Status", "Conf.", "System" (selected), and "About". A left sidebar menu lists various configuration options, with "Product ID" selected. The main content area, titled "Product ID", contains a section for "TCP/IP Option Identifiers" with the following fields:

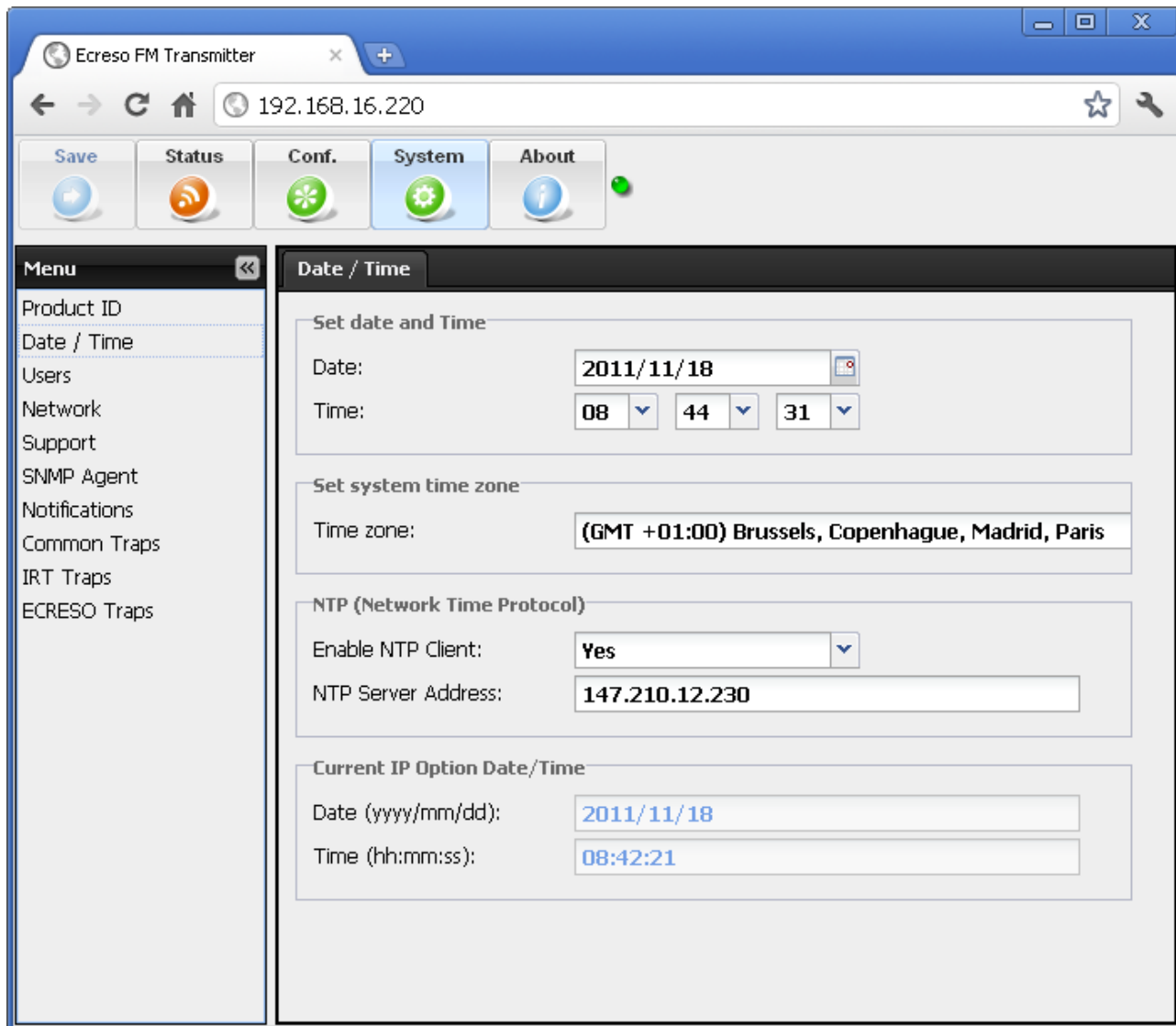
Product Name:	FM Transmitter
Product Description:	FM Transmitter
Serial Number:	TESTOPN
Software Version:	1.0.8
Hardware Version:	1.0

General information regarding the product: 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.

9.5.2. Date / Time



The screenshot shows the 'Ecreso FM Transmitter' web interface. The browser address bar displays '192.168.16.220'. The interface has a top navigation bar with buttons for 'Save', 'Status', 'Conf.', 'System' (highlighted), and 'About'. A left sidebar menu lists various settings: Product ID, Date / Time (highlighted), Users, Network, Support, SNMP Agent, Notifications, Common Traps, IRT Traps, and ECRESO Traps. The main content area is titled 'Date / Time' and contains four sections:

- Set date and Time:** Includes a 'Date:' field with the value '2011/11/18' and a 'Time:' field with values '08', '44', and '31' in separate dropdowns.
- Set system time zone:** Includes a 'Time zone:' field with the value '(GMT +01:00) Brussels, Copenhagen, Madrid, Paris'.
- NTP (Network Time Protocol):** Includes an 'Enable NTP Client:' dropdown set to 'Yes' and an 'NTP Server Address:' field with the value '147.210.12.230'.
- Current IP Option Date/Time:** Includes a 'Date (yyyy/mm/dd):' field with the value '2011/11/18' and a 'Time (hh:mm:ss):' field with the value '08:42:21'.

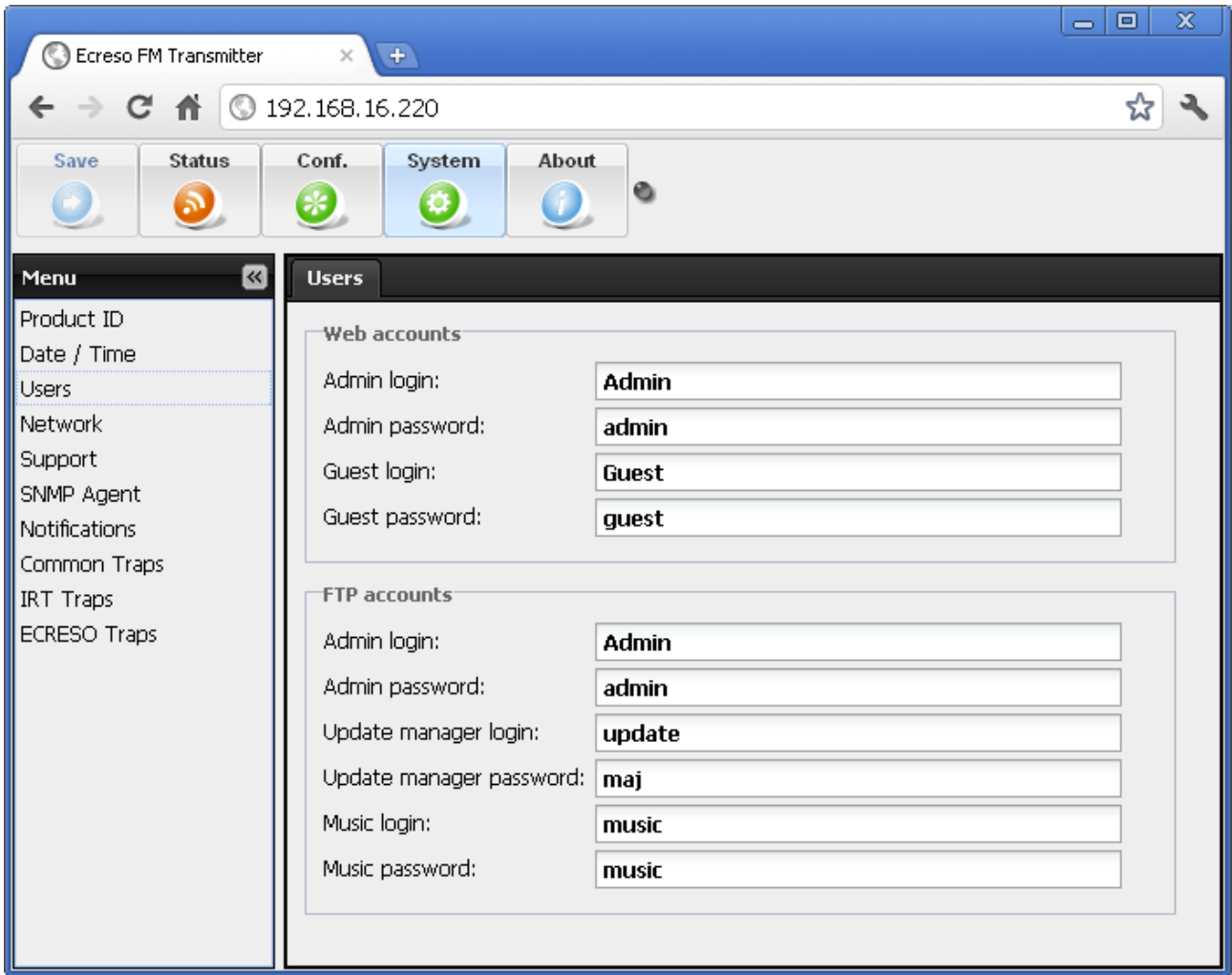
- **Set system date:** the user may update both date (year/month/day) and time (hour/minute/second).

- **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 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!*

9.5.3. Users



The screenshot shows the 'Users' configuration page in the Ecreso FM Transmitter web interface. The browser window title is 'Ecreso FM Transmitter' and the address bar shows '192.168.16.220'. The top navigation bar includes buttons for 'Save', 'Status', 'Conf.', 'System' (which is highlighted), and 'About'. A left sidebar menu lists various settings: 'Product ID', 'Date / Time', 'Users' (which is highlighted), 'Network', 'Support', 'SNMP Agent', 'Notifications', 'Common Traps', 'IRT Traps', and 'ECRESO Traps'. The main content area is titled 'Users' and contains two sections: 'Web accounts' and 'FTP accounts'. Each section has input fields for 'Admin login', 'Admin password', 'Guest login', 'Guest password', 'Update manager login', 'Update manager password', 'Music login', and 'Music password'. The default values are 'Admin', 'admin', 'Guest', 'guest', 'update', 'maj', 'music', and 'music' respectively.

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.

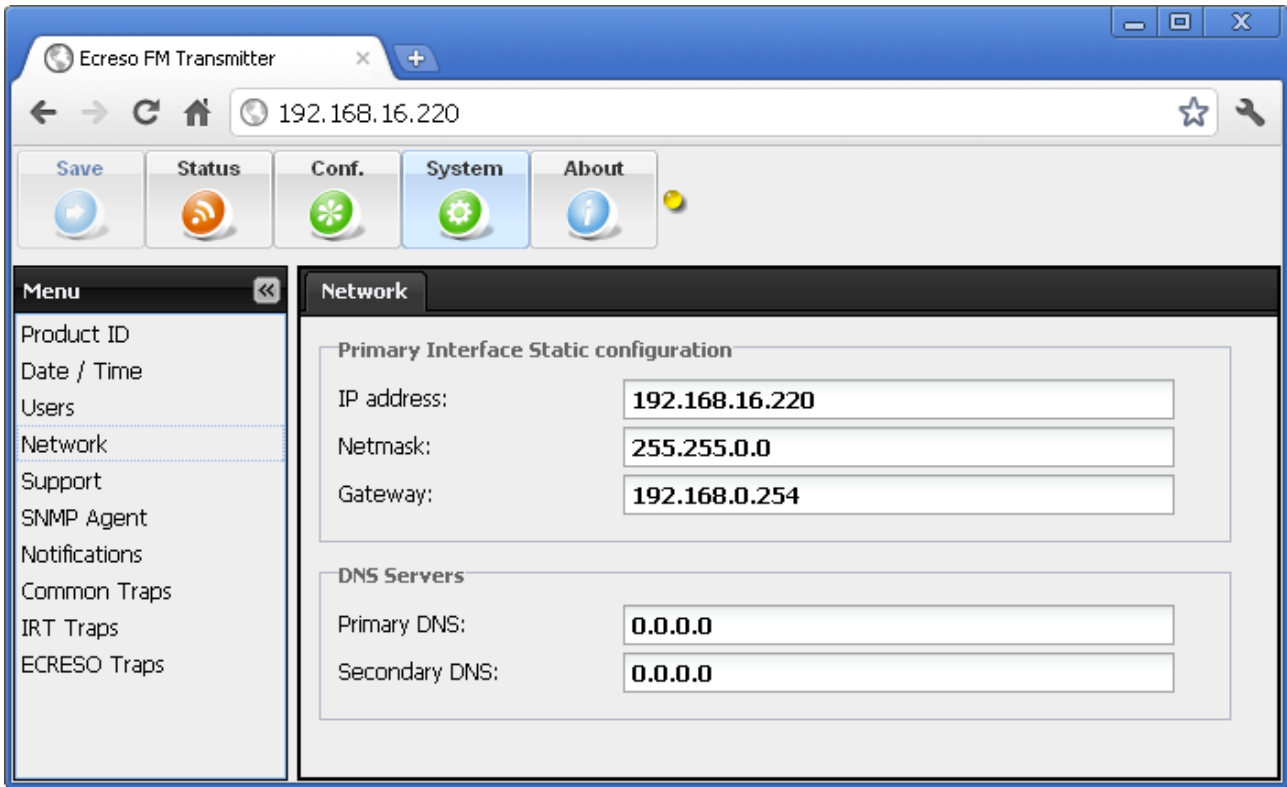
Three FTP accounts are available:

- 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 (music / music by default). This account is used to manage audio backup files.

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

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

9.5.4. Network



The screenshot shows a web browser window titled "Ecreso FM Transmitter" with the address bar displaying "192.168.16.220". The interface has a top navigation bar with buttons for "Save", "Status", "Conf.", "System" (highlighted), and "About". Below this is a "Menu" sidebar with links: "Product ID", "Date / Time", "Users", "Network" (highlighted), "Support", "SNMP Agent", "Notifications", "Common Traps", "IRT Traps", and "ECRESO Traps". The main content area is titled "Network" and contains two sections: "Primary Interface Static configuration" with fields for "IP address:" (192.168.16.220), "Netmask:" (255.255.0.0), and "Gateway:" (192.168.0.254); and "DNS Servers" with fields for "Primary DNS:" (0.0.0.0) and "Secondary DNS:" (0.0.0.0).

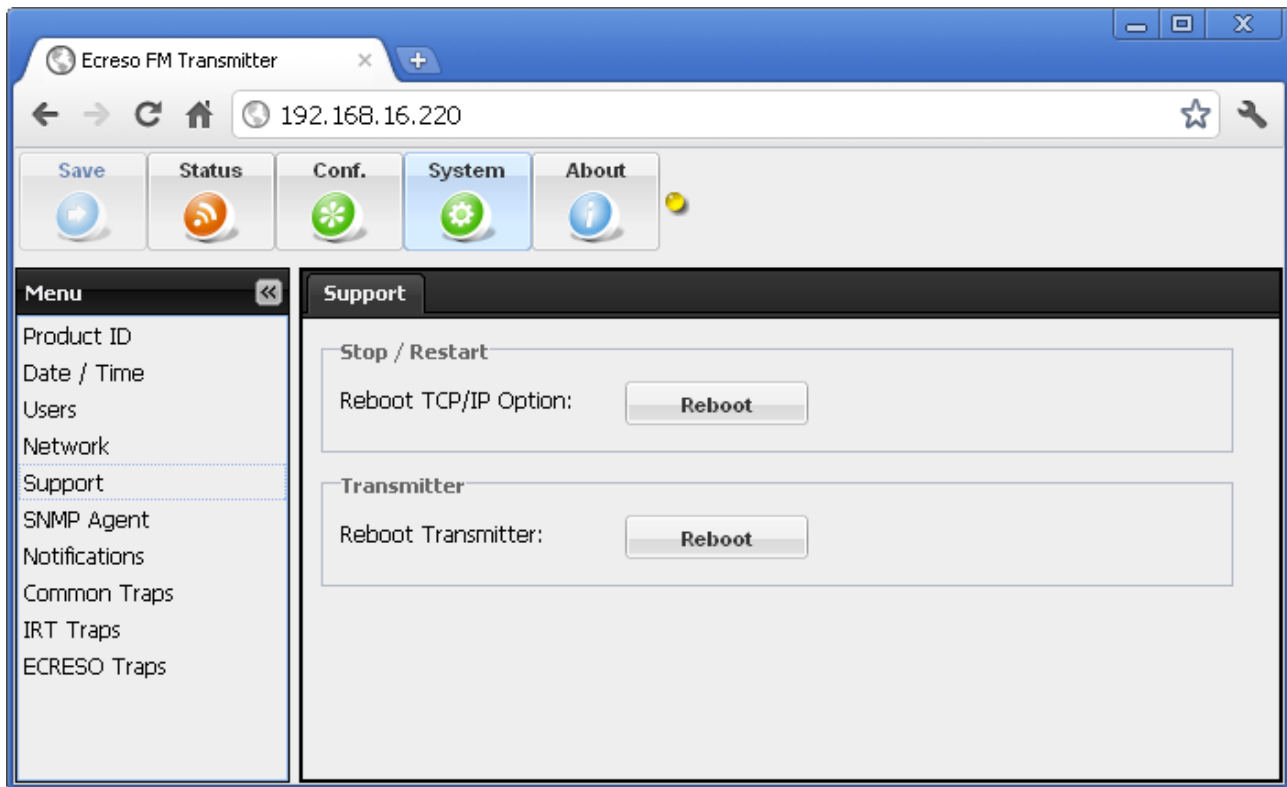
IP Configuration:

➤ Static Ethernet configuration

Set the parameters for the network interface.

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

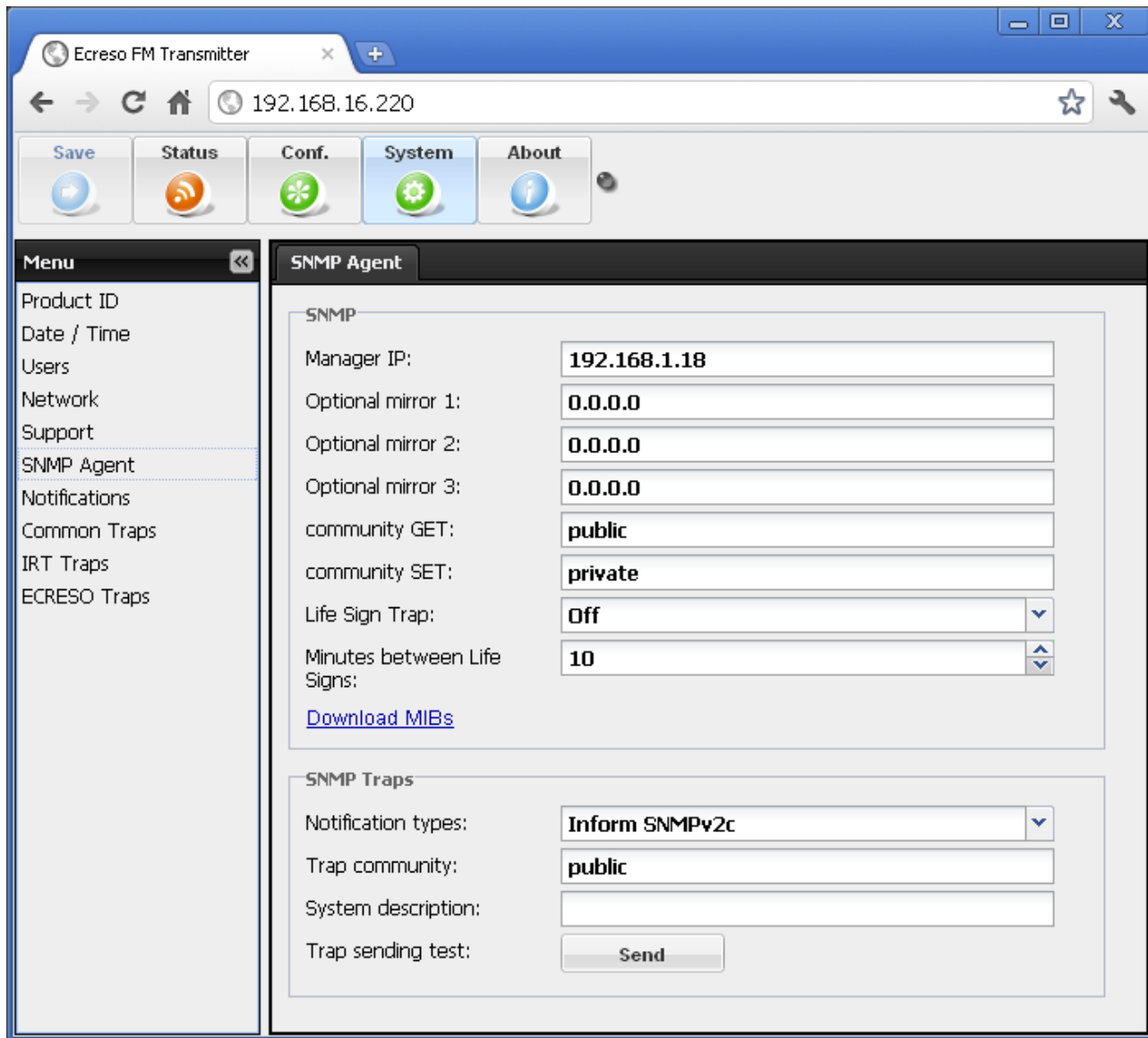
9.5.5. Support



With the 'Reboot TCP/IP option' button, restart the TCP/IP board.

With the 'Reboot Transmitter' button, restart the transmitter's front panel.

9.5.6. SNMP Agent



The screenshot shows a web browser window titled "Ecreso FM Transmitter" with the address bar displaying "192.168.16.220". The interface has a top navigation bar with buttons for "Save", "Status", "Conf.", "System" (selected), and "About". On the left is a "Menu" sidebar with links: Product ID, Date / Time, Users, Network, Support, **SNMP Agent**, Notifications, Common Traps, IRT Traps, and ECRESO Traps. The main content area is titled "SNMP Agent" and contains two sections:

- SNMP**:
 - Manager IP: 192.168.1.18
 - Optional mirror 1: 0.0.0.0
 - Optional mirror 2: 0.0.0.0
 - Optional mirror 3: 0.0.0.0
 - community GET: public
 - community SET: private
 - Life Sign Trap: Off (dropdown)
 - Minutes between Life Signs: 10 (spinner)
 - [Download MIBs](#)
- SNMP Traps**:
 - Notification types: Inform SNMPv2c (dropdown)
 - Trap community: public
 - System description: (empty text field)
 - Trap sending test: Send (button)

➤ SNMP configuration

The equipment enables multiple addresses to be configured for SNMP notifications. However, only the Main Manager has the authority to acknowledge notifications. With "INFORMS" messages, automatic answers from secondary managers are ignored by the unit.

➤ **MIB:** to download the MIB right click on the link and select "Save link as"

➤ SNMP Traps configuration

- SNMP Notification Type / Trap Community / System Description: trap settings
- Life Sign Trap / Minutes between Life Signs: sends life signs every X minutes. This trap makes it possible to check that the unit is connected to the network.

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

9.5.6.1 Supported SNMP versions

The unit implements an SNMP agent conforming to SNMPv1 and SNMPv2c versions. GET and SET commands are supported, as well as GETBULK in SNMPv2c. Notifications can be transmitted in TRAP V1 or V2c form or with an INFORM V2c type.

9.5.6.2 Notification mode

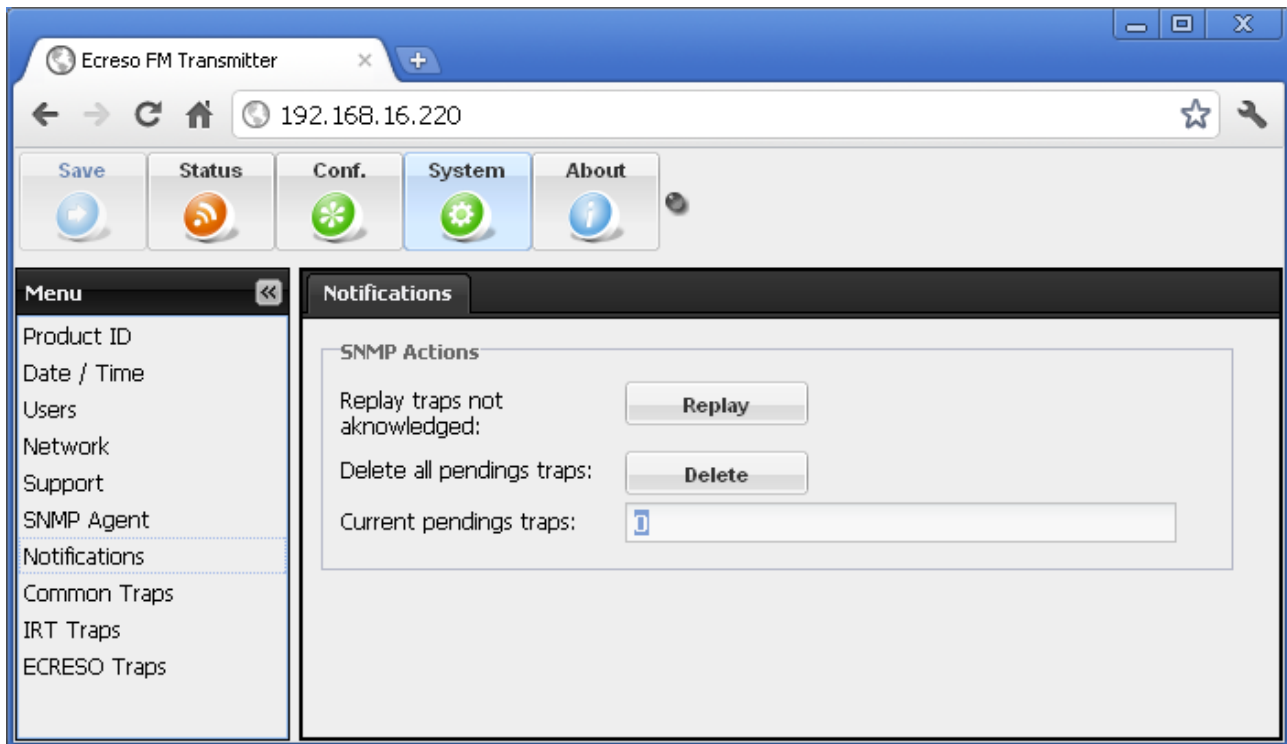
To make sure traps are received by the main recipient, the unit offers 2 methods. With both methods, traps are sent until they are acknowledged.

- **Automatic acknowledgement** for sending with INFORM. These notifications are only available with the version 2c of the protocol. This protocol checks that the manager sends the notification to the transmitter. This process is simple and reliable, no specific configuration is required for the manager.
- **Manual acknowledgement** for Traps V1 and Traps V2c. A specific OID ("alarmPendingAlarmsalarmAck") is extracted and its variables are sent with the trap. The manager must then execute a SET command. This method is more complex but is the only one that can work with the version 1 of the protocol.

The acknowledgment mode (Trap V1, Trap V2c or Inform) is identical for all alarms. See the next section "**Notifications**" for additional settings.

-  *With "SNMPv2c traps" notifications, it not possible to acknowledge traps. In the same way, traps which do not require acknowledgment cannot be sent with the "Inform SNMPv2c" format, even when this format is selected. This is the case with the 'test' trap as well as with equipment information traps such as the 'Equipment On' trap.*

9.5.7. Notifications

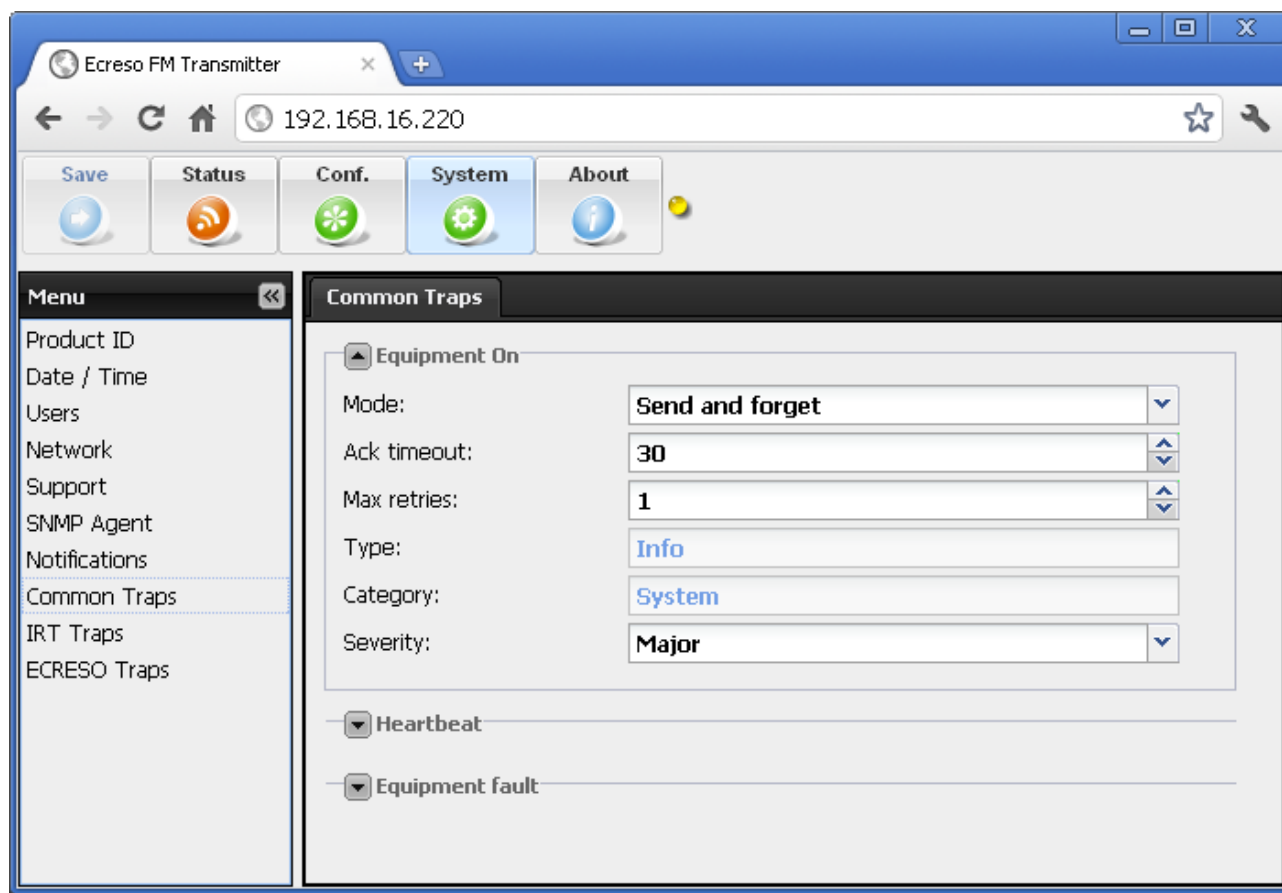


➤ SNMP Actions

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

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

9.5.8. Common traps



The screenshot shows a web browser window titled "Egreso FM Transmitter" with the address bar displaying "192.168.16.220". The interface includes a navigation bar with buttons for "Save", "Status", "Conf.", "System" (selected), and "About". A left-hand menu lists various system components, with "Common Traps" highlighted. The main content area, titled "Common Traps", displays configuration options for "Equipment On". These options include:

- Mode:** A dropdown menu set to "Send and forget".
- Ack timeout:** A text input field containing "30".
- Max retries:** A text input field containing "1".
- Type:** A text input field containing "Info".
- Category:** A text input field containing "System".
- Severity:** A dropdown menu set to "Major".

Below these settings, there are two expandable sections: "Heartbeat" and "Equipment fault", each with a minus sign icon to its left.

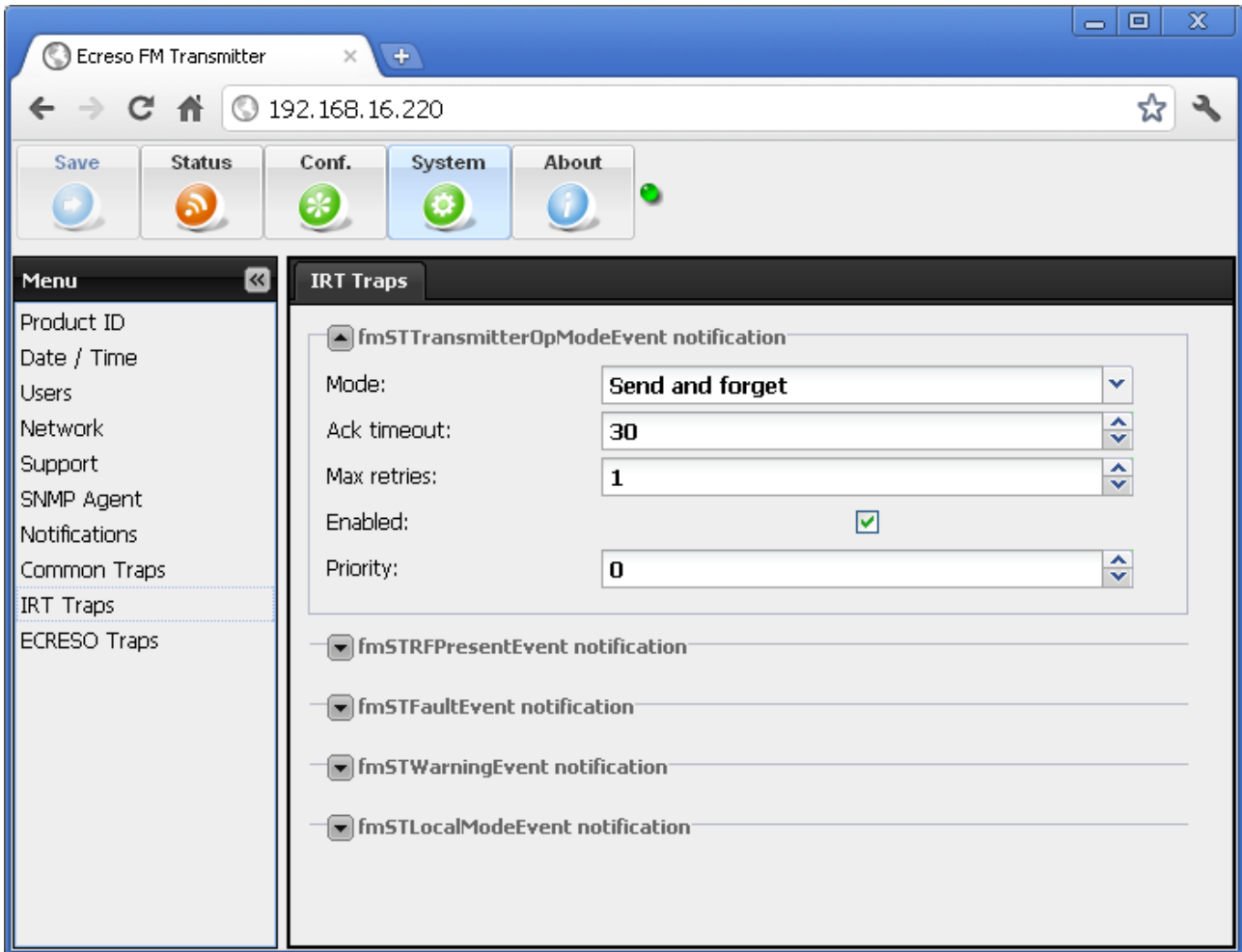
Click the arrow next to the trap name to display its parameters.

Set the mode:

- Resend until acknowledgement: the trap is regularly sent until acknowledgement.
- Send and forget: the trap is sent once, no follow-up is expected.

If "Resend until acknowledgement" is selected, set the time to wait for acknowledgement before resending the trap (Ack timeout) and the maximum number of times the trap will be resent (Max retries).

9.5.9. IRT Traps

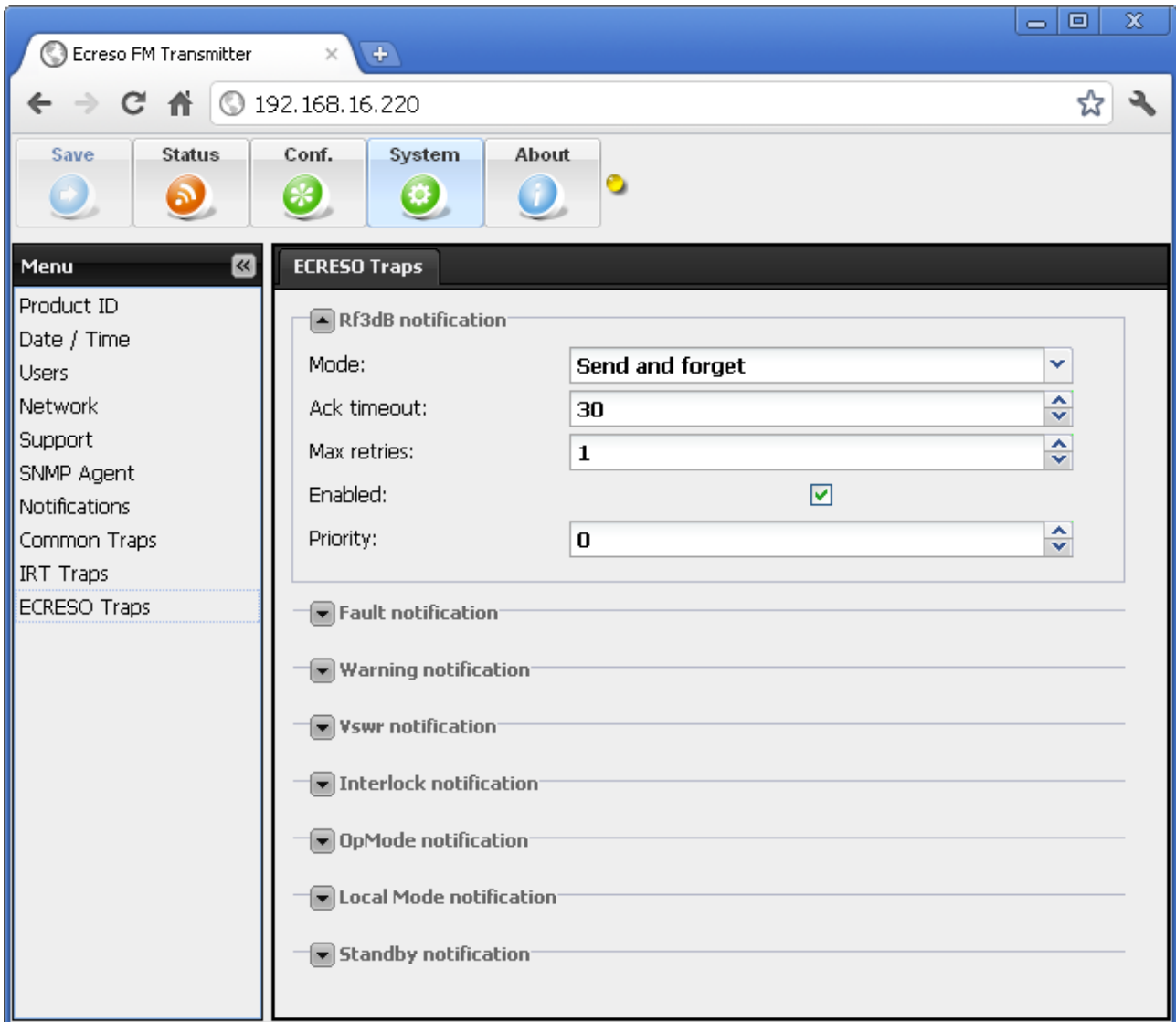


The screenshot shows the 'Egreso FM Transmitter' web interface in a browser window. The address bar shows '192.168.16.220'. The interface has a top navigation bar with buttons for 'Save', 'Status', 'Conf.', 'System' (selected), and 'About'. A left sidebar menu lists various configuration options, with 'IRT Traps' selected. The main content area is titled 'IRT Traps' and contains a list of notification types. The first notification, 'fmSTTransmitterOpModeEvent notification', is expanded, showing configuration fields: 'Mode' (set to 'Send and forget'), 'Ack timeout' (set to '30'), 'Max retries' (set to '1'), 'Enabled' (checked), and 'Priority' (set to '0'). Below this, four other notification types are listed with expandable arrows: 'fmSTRFPresentEvent notification', 'fmSTFaultEvent notification', 'fmSTWarningEvent notification', and 'fmSTLocalModeEvent notification'.

IRT traps are configured like common traps (see previous section), with 2 additional parameters:

- To enable the trap, check "Enabled".
- Set the priority; this information which is sent with the traps can be used by an SNMP Manager as filter criteria for instance.

9.5.10. Egreso Traps



The screenshot shows a web browser window titled "Egreso FM Transmitter" with the address bar displaying "192.168.16.220". The interface includes a navigation bar with buttons for "Save", "Status", "Conf.", "System" (selected), and "About". A left-hand menu lists various system components, with "ECRESO Traps" highlighted. The main content area, titled "ECRESO Traps", contains several configuration sections:

- RF3dB notification** (expanded):
 - Mode: Send and forget (dropdown)
 - Ack timeout: 30 (spinner)
 - Max retries: 1 (spinner)
 - Enabled: ☒
 - Priority: 0 (spinner)
- Fault notification** (collapsed)
- Warning notification** (collapsed)
- Vswr notification** (collapsed)
- Interlock notification** (collapsed)
- OpMode notification** (collapsed)
- Local Mode notification** (collapsed)
- Standby notification** (collapsed)

Egreso traps are configured like common traps (see section 9.5.8).

 No trap is sent on automatic audio switch.

9.6. About

This window displays information regarding the web application



APPENDIX A: SOFTWARE OPTION MANAGEMENT

A set of options is available for Helios FM transmitters. Contact your Ecreso dealer if you wish to install one of them after the initial transmitter purchase.

You will need to retrieve the software activation key from the transmitter and forward to your Ecreso 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 front panel, the PC application or serial commands. Follow the selected procedure as described below.

A.1. Using the front panel application

Display the License menu, only visible in Expert mode (first switch to Expert mode if necessary).

```
9 8 . 0 0 M H z      1 0 0 W
-> L I C E N S E >
```

Press the “Enter” button and write down the transmitter’s serial number.

```
1 S E R I A L N U M B E R
  0 0 0 0 0 0 2 5
```

Press the “+” key until you see this screen.

```
1 E N A B L E L I C .
  -> N E W >
```

Press the “Enter” button to access the Enable License sub-menu, then press “Enter” again to generate the key for your transmitter.

```
2 G E N E R A T E K E Y
  -> G O
```

Send the serial number and the key to Ecreso.

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 E N A B L E L I C .
  -> P E N D I N G
```

Once you have received the new key, press the “Enter” button to display this screen and press Enter again to switch to edit mode.

```
2 E N T E R K E Y
-> 0 0 0 0 0 0 0 0 0 0 0
```

Using the “+” and “–” keys, adjust the value for each digit, press “Enter” to go to the next digit.

Press the “+” key until you see the Go To screen and select ‘License’ to return to the previous level of menus.

```
1 G O T O
-> L I C E N S E -> A D D .
```

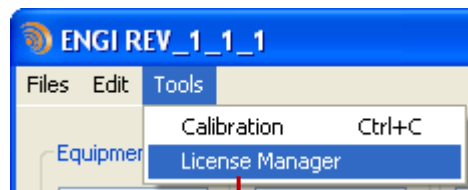
Press the “+” key to access the Current License screen. The new license should now be part of the list.

```
1 C U R R E N T L I C E N C E
-> R D S B A S I C , P L A Y E
```

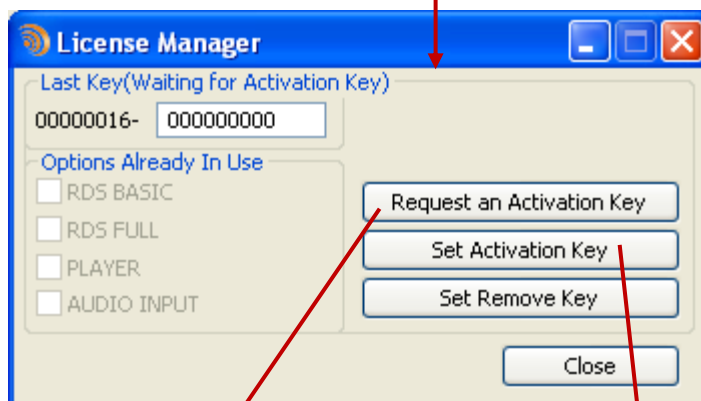
A.2. Using the PC application

License management is only available with Engi version 1.1.1 (or more recent).

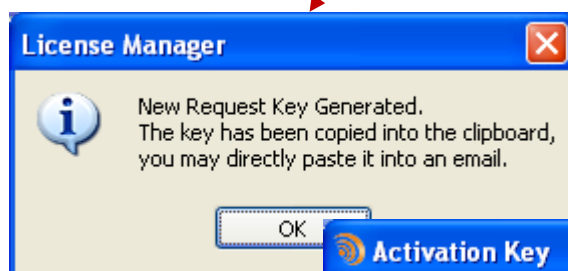
Connect to the transmitter with the Engi application, either with a direct connection or via the network (see section 7) and display the Tools/License Manager menu.



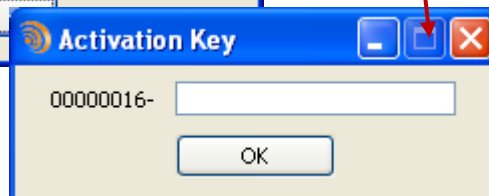
Click the 'Request an Activation Key' button: a value is generated by the transmitter and copied into the clipboard.



Send this key to Ecreso.
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.

A.3. Using serial commands

Connect a PC to the front panel serial port as described in section 6.

Send the command:

```
SYS.KEY.ADD
```

The return value will have the following format: *serial_number-key1*.

Send this key to Ecreso.

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 Ecreso.

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.

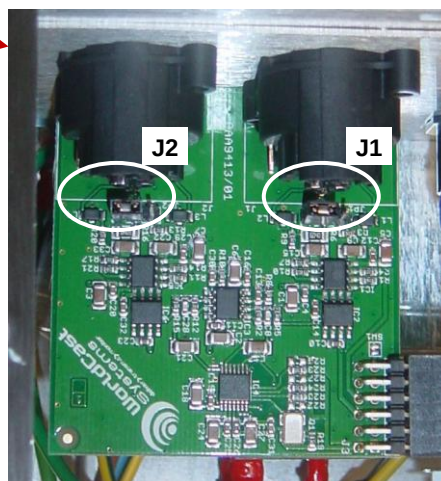
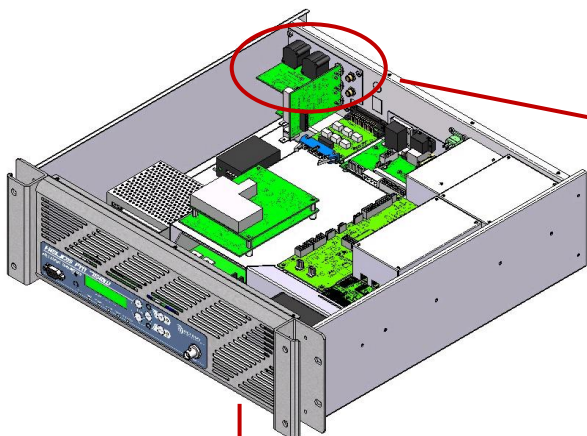
APPENDIX B: ADJUSTING THE IMPEDANCE OF ANALOG INPUTS

Default impedance of analog inputs is high.

It can be set to 600 Ω by jumpers.

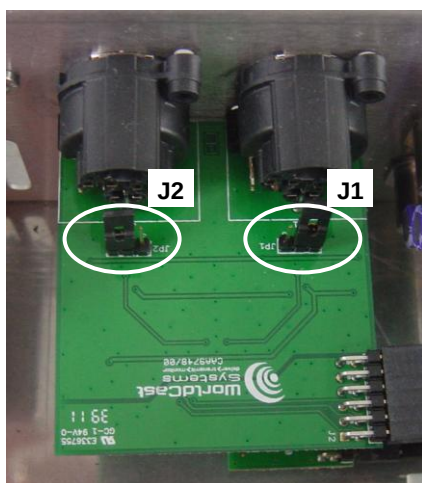
Before setting the jumpers, make sure that all cables are disconnected. Remove all the screws securing the cover.

Depending on the version of your transmitter, you may have either a type I or a type II audio board.



Jumper position on a type I carte board:

	J2	J1
High impedance		
600 Ω		



Jumper position on a type II carte board:

	J2	J1
High impedance		
600 Ω		

APPENDIX C: MAINTENANCE

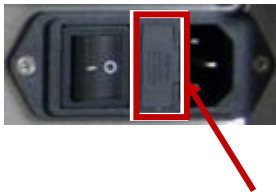
To order spare parts, please contact your Audemat dealer.

C.1. Changing the fuses

-  *If you need to change the fuses, make sure the surge protector has not been damaged (see section C3).*

Helios FM 350 W / 750 W / 1000 W:

Fuses are located in the power socket on the rear panel. Open the trap to remove them.



Helios FM 1500 W / 2000 W:

On the rear panel, the switch can En face arrière, l'interrupteur peut avoir trois positions :



The transmitter is on



The transmitter is off



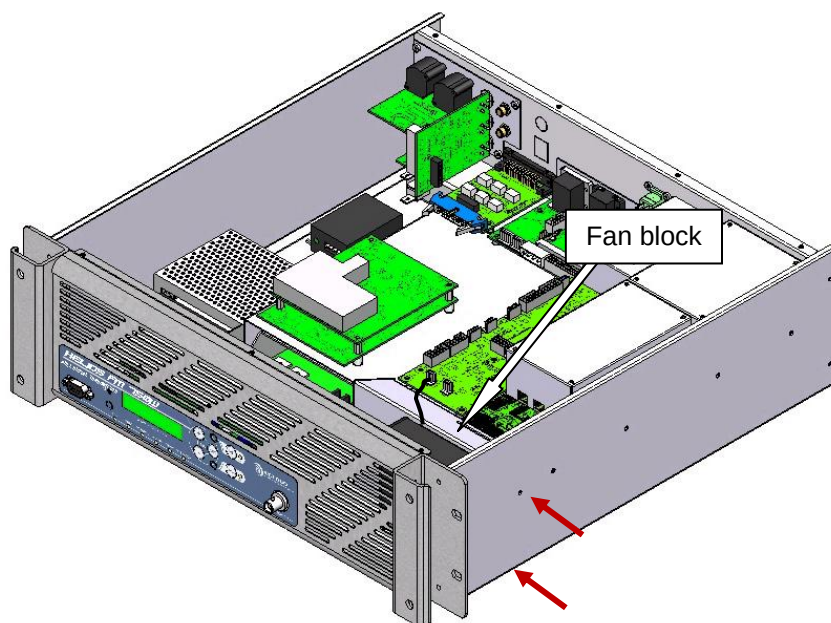
The circuit has been cut off. Turn off the module (position 0) and turn it on again (position 1) to reset it.

C.2. Changing the fan

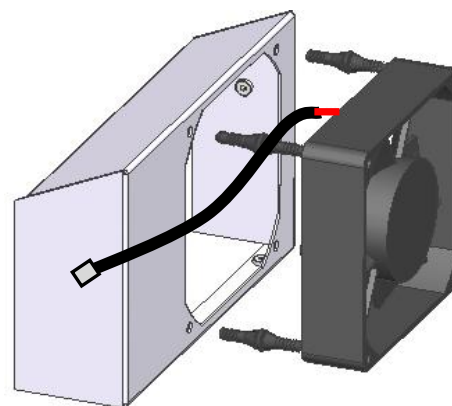
Fan reference: SP01309

Fans should be changed every 3 years.

- Turn off the module needing a new fan and pull it out of the cabinet.
- Unscrew all lid screws and remove the lid.



- Unscrew the screws that keep the fan in place: 1 on the side and 2 under the frame.
- Disconnect the cable connecting the fan to the control board.
- Pull out the fan block.
- Take out the fan from its frame by gently pulling the 4 rubber legs.
- Insert the legs of the new fan using pliers. Make sure the cable does not get stuck.
- Place the fan block back in the frame.
- Screw it back with 2 screws under the frame and one on the side.
- Connect the fan cable on the FAN1 connector of the control board.
- Screw the lid back in place.



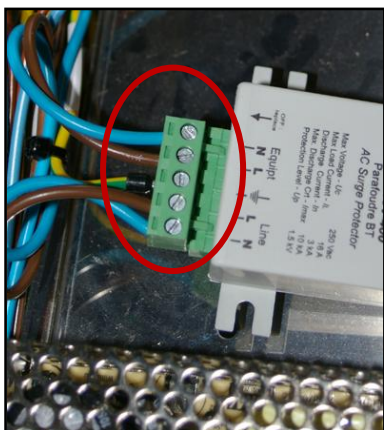
C.3. Changing the surge protector

To check whether the surge protector is damaged, remove the top cover: if the surge protector indicator LED is on, it is ok, if the LED is off, the surge protector needs to be replaced.

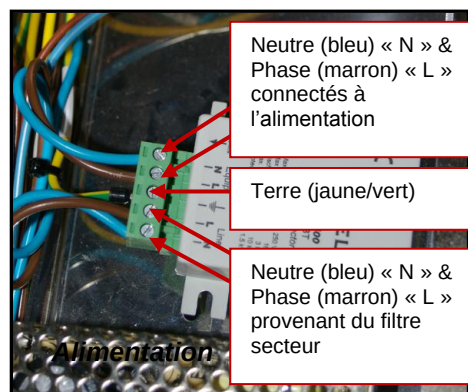
The surge protector is located between the power supply bloc and the mains filter.

Helios FM 350 W / 750 W / 1000 W:

1. Disconnect the unit.
2. Unscrew the top cover and remove it.
3. Using pliers, remove the metal washers that keep the surge protector in place on the rivets and unscrew the cables connecting it to the power bloc, to the mains filter and to the ground.



1. Replace the old surge protector with the new one.
2. Connect the 5 wires of the terminal as shown.
3. Snap the washers on the rivets to secure the surge protector in the chassis.
4. Set the cover back in place.



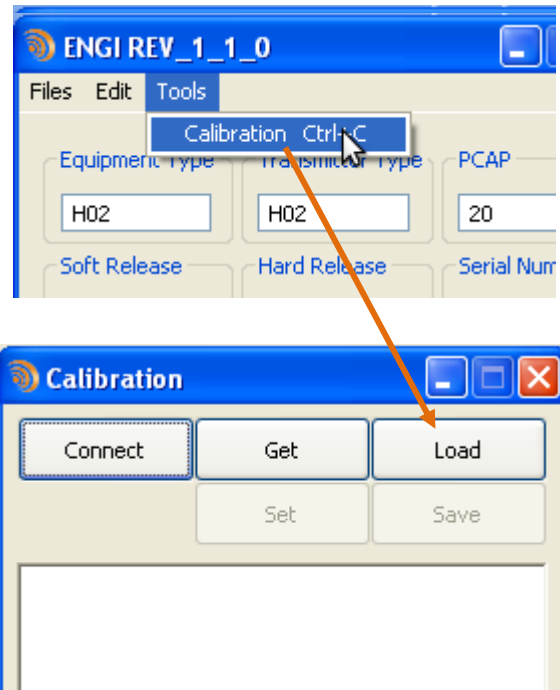
APPENDIX D: TROUBLESHOOTING

D.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 section 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 Ecreso.
- Click the “Set” button to load the calibration file into the unit.



D.2. Complete Reset of the Helios FM

! *The reset procedure erases you whole configuration; however the calibration is kept.*

Connect a PC to the front panel serial port as described in section 6.

Send the command:

```
SYS.RAZ=RAZ
```

After the module has restarted, on the front panel:

- Enter the transmitter’s nominal power (example 750 for a Helios FM 750 W)
- Set the CAN Id to 00
- Exit the Init Config menu to return to standard menus.

```
T X   P C A P
-> 7 5 0
```

```
I D   C A N
-> 0 0
```

```
I N I T   C O N F I G
E X I T
```

FOR MORE INFORMATION

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