

IDENC

DAB/DAB+ Audio Encoder

User's manual



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Section

Introduction

1

1 Introduction

The system is supplied in a steel case, the front shows the status of the machine, the rear contains all the connectors including the Gigabit LAN interfaces through which it can be connected to the multiplexers, to the internet as well as to be administered via integrated web server.

The machine integrates a DAB + encoding system that allows you to capture audio from streaming sources or analog and digital audio inputs, encode it according to the DAB or DAB + standard, add SLS and DLS into the PAD (program associated data), then create the stream TCP ready to be transferred to the multiplexers.

The encoder contains patented software parts and Digital Audio Broadcasting technology released under license from Fraunhofer IIS to ITEL, it contains also audio processing library property of ITEL, any violation, attempt of extraction or attempt to reverse engineering on software and hardware parts is sanctioned and prosecuted even criminally according to the relevant legislation in the countries of ITEL and Fraunhofer IIS.

<http://www.iis.fraunhofer.de/audio>

The configuration interface that will be presented below allows the encoder to start up in a few steps.

It is advisable to place the system in an air-conditioned and dust-free environment, the temperature range in which the server guarantees perfect and continuous operation is 5 ° C / 35 ° C.

1.1 Revisions

1.1.0	10/09/2017	First edition
1.2.0	01/11/2018	Second edition
1.3.0	01/03/2019	Third edition
1.4.0	20/02/2020	Fourth edition
1.5.0	15/07/2020	Fifth edition
1.6.0	23/11/2020	Sixth edition
1.7.0	24/05/2021	Seventh edition
2.0.0	28/10/2021	Eighth edition
2.1.0	27/01/2022	Ninth edition
2.2.0	25/07/2022	Tenth edition
2.2.1	29/11/2022	Eleventh edition
3.0.0	22/02/2023	Twelfth edition
4.0.0	12/03/2025	Thirteenth edition
4.1.0	09/10/2025	Fourteenth edition
4.1.1	10/11/2025	Fifteenth edition
4.2.1	22/07/2026	Sixteenth edition

1.2 Warnings



Before carrying out any operation, follow the safety rules contained in the following paragraph.

The manufacturer declines all responsibility in case of damage to persons or things due to non-observance, even partial, of the following indications

- Make sure that the supply voltage corresponds to what is reported on the appliance.
- Check that the electrical system is equipped with an earth socket
- Use only earthed sockets
- Disconnect the power supply before carrying out any operation inside the appliance.
- The device for disconnecting the device is the power cable, so this must be easily accessible and the socket must be placed near the device itself.
- Any operation that entails access to the internal parts of the equipment must be completed, after disconnection of this from the electrical network, exclusively by qualified technical personnel.

1.3 Front Panel

Front view



Key switch and Leds on front panel



Power switch: If pressed more than 3 seconds the device shut-down

Reset switch: Reboot system

Red led: Drive activity

Yellow led: Lan activity

Green Led: Power ON

Usb 2.0 Ports

1.4 Rear Panel

Rear view

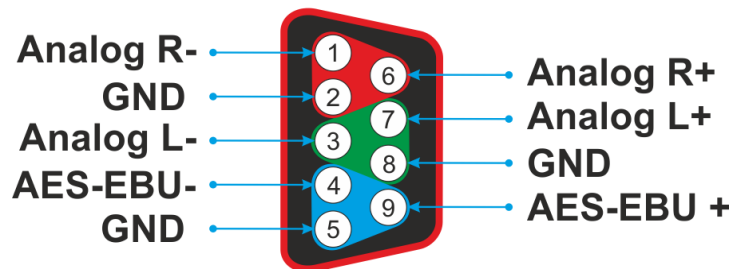


Rear connectors

- | | |
|-------------------|--|
| • AC IN | Power connector 100-240VAC 50-60Hz |
| • PS/2 | Only for Recovery function |
| • ETH | Ethernet connector RJ45 |
| • USB | Only for Recovery function |
| • USB 3.0 | Not used |
| • HDMI | Only for Recovery function |
| • COM1 | Reserved for future feature |
| • VGA | Only for Recovery function |
| • AUDIO INPUT 1/2 | Audio input connector with supplied cable DB9-M -> XLR-F |
| • GPIO | Remote control connector DB15-F |

Audio Input connector

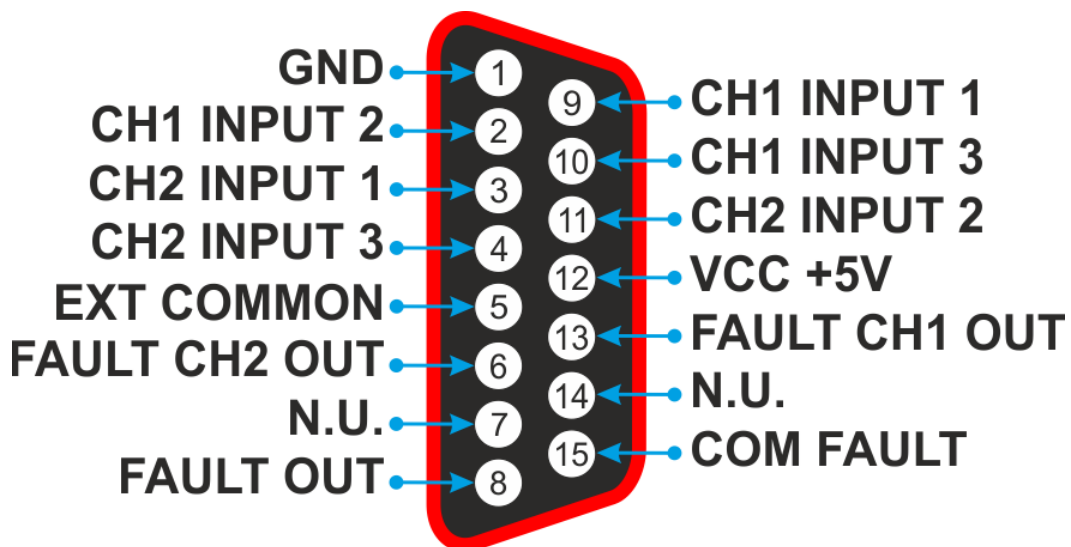
The audio inputs are connected via the cable supplied with standard female XLR connectors, on the rear panel there are two 9-pole DSUB female connector with the following connection arrangement:



PIN	Description
1	Analog input Right -
2	GND
3	Analog input Left -
4	AES EBU / Digital input -
5	GND
6	Analog input Right+
7	Analog input Left+
8	GND
9	AES EBU / Digital input +

1.5 GPIO connector

The GPIO connector allows monitoring and controlling the encoder through opto-isolated inputs and outputs. The inputs are polarized optocouplers, each input includes a 470-ohm protection resistor in series. The maximum current allowed per optocoupler is 20 mA. The outputs are solid-state relay type, referenced to the EXT COMMON contact, so the signal can be either low impedance (CLOSE) or high impedance (OPEN). The maximum applicable current is 100 mA, with a typical closed resistance of 16 Ohms. The voltage supplied between pin 12 and pin 1 is +5 VDC, with a maximum allowed current draw of 200 mA.



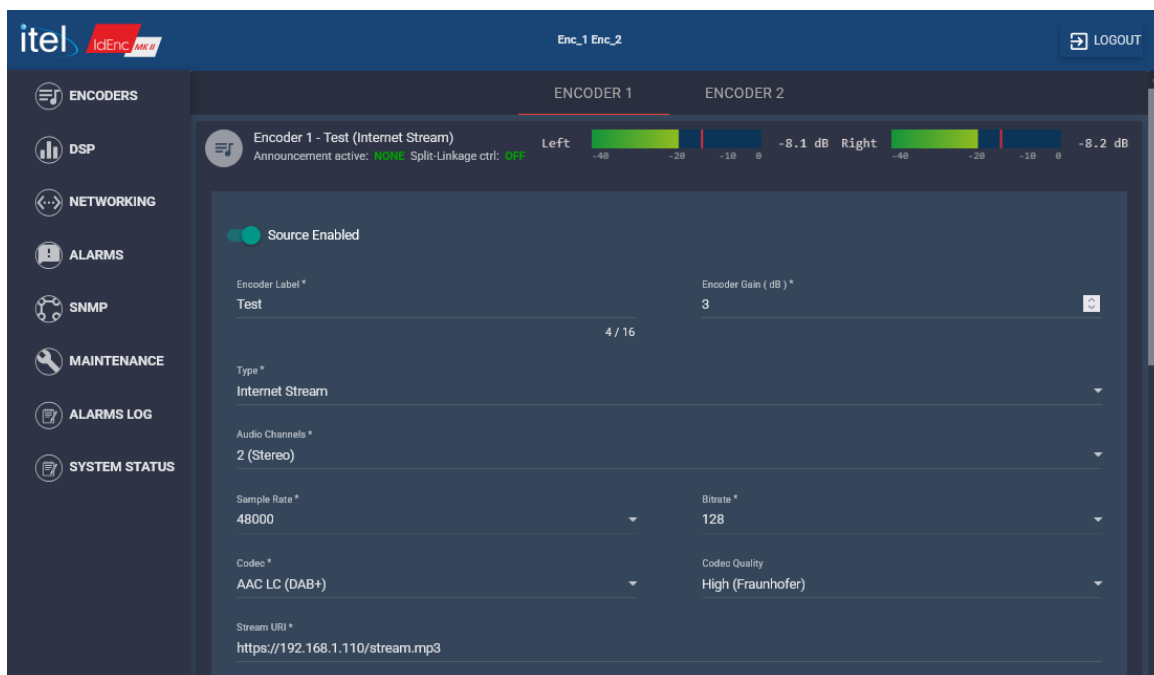
Section

Configuration

2

2 Configuration

The system configuration is completely managed by the web interface, reachable at the IP address of the device at the standard port 80.



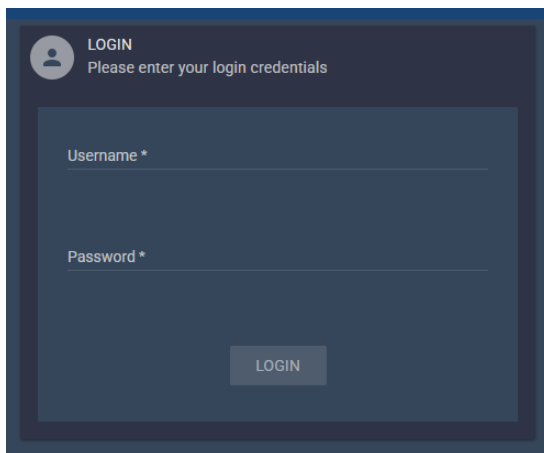
2.1 Start Up

Connect the Ethernet port of the Encoder using a LAN cable to your local network, select an IP of the computer in the 192.168.0.xxx class except value 192.168.0.10, then open the browser and type 192.168.0.10, at this point the login request will be displayed.

If you want to change the IP from the [Recovery](#) menu, please read this chapter at the end of the manual.

From the networking menu it is possible to modify the network addresses of the interfaces.

2.2 Login

A login form with a dark blue background. At the top left is a user icon. To its right, the text 'LOGIN' is displayed in white, followed by 'Please enter your login credentials' in a smaller white font. Below this, there are two input fields: 'Username *' and 'Password *', both with white text. At the bottom center, there is a 'LOGIN' button with white text on a dark blue background.

At the first start the credentials to access are:

Username: admin

Password: admin

By clicking on LOGIN you access the home page where you can configure the device.

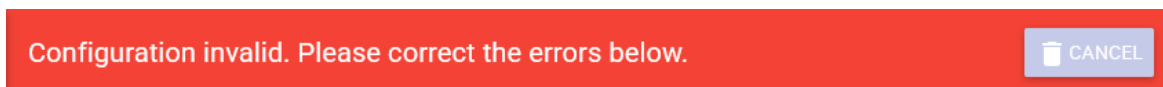
In the left column we find the menu icons for the configuration, in the top right the LOGOUT button to exit the session.

2.3 Edit And Save Parameters

Every time a parameter is modified at the top you will notice the message "Configuration changes detected", clicking APPLY will save as previously set, by clicking cancel it is possible to cancel the modification.

A red horizontal bar containing the text 'Configuration changes detected.' in white. To the right of the text are two buttons: a green button with a white checkmark and the text 'APPLY', and a light blue button with a white trash icon and the text 'CANCEL'.

If the message above is "Configuration invalid. Please correct the errors below" will be necessary to correct the errors in the configuration highlighted in red before proceeding. An invalid configuration is not accepted.

A red horizontal bar containing the text 'Configuration invalid. Please correct the errors below.' in white. To the right of the text is a light blue button with a white trash icon and the text 'CANCEL'.

2.4 Encoders



In the Encoders section the coding sources are shown, depending on the license's type , one or two sources will be available, each one can encode the audio coming from the analogue, digital input or from a streaming source.



Clicking on the two labels Encoder1 and Encoder2 accesses the menu with the encoder configuration parameters.

For each encoding process, two RMS/PEAK level indicators are displayed with a coloured scale starting from green for the lowest values near -40 dB, moving through yellow to red near 0 dB. To the right of this scale, the peak audio level is shown numerically.

The red line within the coloured scale represents the peak value itself.

The values shown do not refer to the audio input to the machine, but rather refer to the left and right channel levels at the encoder input.

Changes to the "Encoder Gain" value or activation/deactivation/modifications to the DSP process will affect the displayed value.

To the right of the audio bars are two indicators: one relating to any active announcements; if none are active, **NONE** is displayed. The other relates to the command to activate or deactivate the channel's linkages. These control whether or not the channel can be exchanged with FM and DAB subnets.

The announcement and split-linkage control commands are sent along with the data stream containing the channel's audio and are automatically managed by the multiplexer.

For each Encoding process there are three configuration sections: **Encoder**, **Pad** and **Announcements**.

2.4.1 Encoders Configuration

The following configuration parameters are present for each Encoder:

Source enabled: allows you to activate or deactivate the selected encoder.

Encoder Label: Channel label (this label is not the name of the channel in the Multiplexer)

Type: allows you to choose the type of source between **direct input** as analogue or digital input, **internet streaming** and **AES67**:

DIRECT INPUT:

If the **Type Direct Input** has been selected, on the right will be show:

Select input: it allows the choice between the two analog inputs Analog 1 and Analog 2 and the two digital inputs AES-EBU Digital 1 and Digital 2. If the digital input has been selected, the encoder will be able to receive an AES-EBU stream with samplerate from 32000Hz up to 192000Hz, an internal resample will adapt the input sampling frequency to the samplerate of the encoder.

If the analog input is chosen, the Reference level field will be shown, this allows you to vary the reference level of the input from -12 to + 12 dBu in steps of 1dB.

If the digital input is selected, the Reference level field will be shown below, this you to set the reference level of the AES-EBU input from 0 to -12 dBFS.

INTERNET STREAM:

Encoder Label *	Encoder Gain (dB) *
Enc_1	0
5 / 16	
Type *	
Internet Stream	
Audio Channels *	
2 (Stereo)	
Sample Rate *	Bitrate *
48000	128
Codec *	Codec Quality
AAC LC (DAB+)	Default
Stream URI *	
https://192.168.1.1:5600/stream.mp3	

If the **Internet Stream Type** has been selected, the Stream URI field will be displayed further down where you can enter the streaming source address and, at the top right, the **Encoder Gain** parameter which is useful for correcting the audio level in a range between -12 and + 12 dB with 0.1 dB steps.

AES67:

Encoder Label *	Encoder Gain (dB) *
Enc_1	0
5 / 16	
Type *	AES67 Input Interface *
AES67	eth1
AES67 Multicast IP Address *	AES67 Port *
239.69.231.72	5004
AES67 Input Sample Rate *	AES67 Input Bit Resolution *
48000	32
AES67 Input Channels *	AES67 Payload *
2 (Stereo)	96

If the **Type AES67** is selected the following fields will be shown:

- **Encoder Gain:** allows you to correct the audio level in a range between -12 and +12 dB in 0.1dB steps.
- **AES67 input interface:** allows you to select from which ethernet interface you want to receive the AES67 multicast stream.
- **AES67 Multicast IP Address:** here you must specify the multicast address from which you receive the AES67 stream.
- **AES67 input sample rate:** here you must select is the sampling frequency of the AES67 stream to be received (32, 44.1, 48, 64, 96 KHz).
- **AES67 input Bit Resolution:** here you must select the number of resolution bits of the AES67 stream to be received (16, 24 ,32 bit).
- **AES67 input channels:** here you have to choose if the AES67 stream you are receiving is mono or stereo.
- **AES67 Payload:** choice of the payload applied to the data stream, the values range is from 0 to 127, the values normally used for Livewire, Dante, etc. are 96 and 97.

Regardless of the input type, the following configuration parameters are always present:

Audio channels: allows you to select the number of channels, the choice is between mono and stereo, in the case of AAC-HE v2 SBR + PS encoding the use of mono is not allowed, in the case of AAC-HE v1 SBR encoding with mono audio is recommended a maximum bitrate of 64 Kbit/s, all bitrates are available for mono-coded AACLC.

Sample rate: is the choice of the sampling frequency with which the signal is coded, if we have chosen the DAB coding the available frequencies are 24KHz and 48KHz, in the case of DAB + 32KHz and 48KHz.

Bitrate: is the amount of bits per second with which the source will be coded, the choice of this parameter is conditioned by the codec type selected previously (for AAC-LC encoding possible bitrates between 16Kbit/s and 192Kbit/s, for AAC-HE v1 encoding SBR possible bitrate between 16Kbit/s and 128Kbit/s, for AAC-HE v2 code SBR + PS possible bitrate between 16Kbit/s and 96Kbit/s). In the case of DAB coding, the bitrate can vary from 32 to 256Kbit/s.

Codec: allows you to choose the encoding mode between the DAB and DAB + standard:

In case of DAB + coding it will be possible to choose between AAC-LC or AAC + low complex, or AAC-HE v1 or SBR side band replication, or AAC-HE v2 or SBR + PS side band replication + parametric stereo, in particular this last choice allows you to work with maximum bitrate of 96Kbit/s. In general the AAC-HE v2 codec is recommended for smaller bitrates equal to 72Kbit/s.

In the only case of Codec Quality "Default" is it also possible to choose 8Kbps.

In case of DAB + coding you can find the **Codec Quality** choice, if you have Fraunhofer license enabled you can choose the High quality or standard quality codec.

In case of DAB encoding, the **Audio mode** and **Psychoacoustic model for MP2 coding** fields will be shown

Audio mode: if previously the DAB standard has been selected, the choice for MP2 encoding between: Stereo, Dual, Joint stereo and mono will be shown.

Psychoacoustic model for MP2 coding: if previously the DAB standard has been selected, the choice for the psychoacoustic model of the MP2 will be shown.

2.4.2 Destination

The Destination section concerns the configuration for the connection to the destination Multiplexers, there are 5 editable fields where you can specify the address and port for sending the stream to the respective Multiplexers

The screenshot displays the 'Destination' configuration section of the IDENC interface. It contains five destination entries, each with a status indicator and a refresh button. The settings for each destination are as follows:

Destination #	Status	Dest. Enabled	Dest. Type *	IP Address *	Port *	MUX Label	Interface
Destination #1	CONNECTED	☒	EDI (TCP)	192.168.1.144	8128	main	All interfaces
Destination #2		☐	EDI (TCP)	192.168.1.144	8228		All interfaces
Destination #3	CONNECTED	☒	EDI (TCP)	192.168.1.144	8014	standalone	All interfaces
Destination #4		☐	EDI (TCP)	0.0.0.0	1		All interfaces
Destination #5		☐	EDI (TCP)	0.0.0.0	1		All interfaces

Below the destination list, there are additional settings:

- EDI TS Enabled (all EDI dest.):** ☐ (disabled)
- EDI TS Delay (all EDI dest.):** 0
- UTC Offset Mode:** TAI Download
- UTC Offset:** 0

Destination Enabled: Destination Enabled/Disable

Destination Type: It defines the type of protocol used to transfer the encoded stream from the encoder to the multiplexer, you can choose between Tcp, Edi Tcp standard EDI protocol on Tcp, Edi Udp protocol standard EDI on Udp, the last one is not recommended if the data stream go through public networks (internet).

Destination IP Address: Multiplexer IP Address.

Destination Port: Multiplexer Port

Mux Label: In this field you can enter the name of the multiplexer that we are going to feed, the label has no effect on the configuration.

Interface: Specify the physical interface to be used to connect the destination

For each destination, the connection status is shown on the right of "STATUS" label: if connected, **CONNECTED** will be displayed in green, if disconnected **DISCONNECTED** in red. These conditions, in addition to being displayed, are logged, are reported in the snmp MIB and produce, if configured, an snmp trap.

EDI TS Enabled: Enables the sending of the time stamp in the EDI blocks.

EDI TS Delay: Shift value inserted in EDI blocks, this produces a similar delay in inserting the content into the multiplexer stream.

UTC Offset mode: Allows you to choose how to manage the UTCO field present in the timestamp, in TAI Download mode the multiplexer will download the table containing the bulletin where the change of the leap second is announced as well as the current value, in manual mode it will be possible to insert in the next field UTC Offset the value of the seconds.

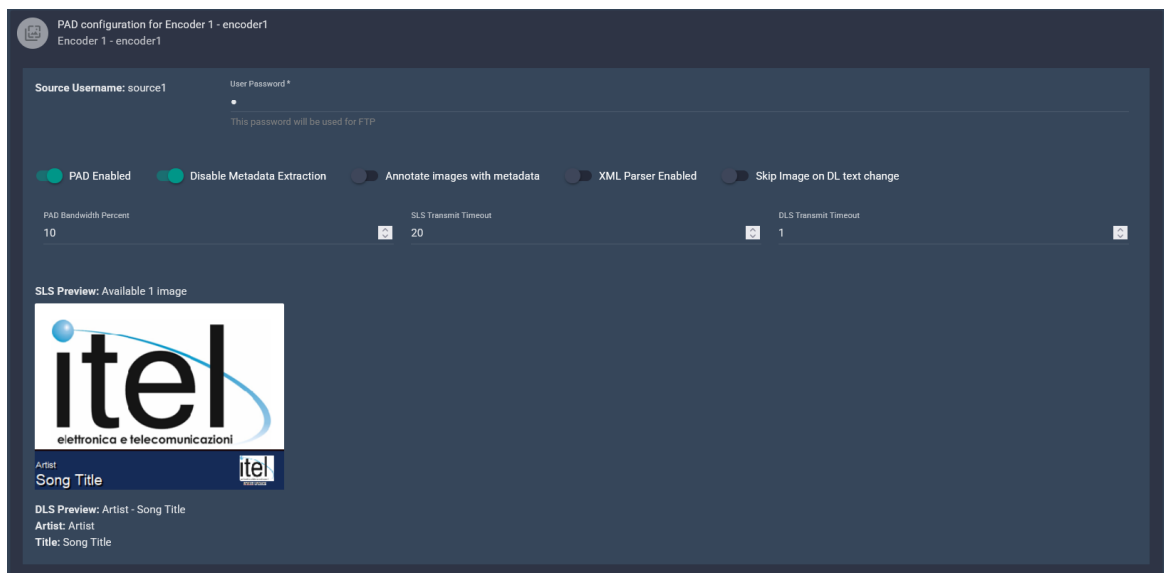
UTC Offset: is the value of the UTCO inserted in manual mode in the timestamp currently the value is equal to 5 seconds or Leap seconds 37 - TAI GPS offset 32.

For more information on the Timestamp, please refer to ETSI TS 102 693 V1.1.2

https://www.etsi.org/deliver/etsi_ts/102600_102699/102693/01.01.02_60/ts_102693v010102p.pdf

2.4.3 Pads

The Pads section shows the parameters that allow you to control the sending of data containing images and text, this data is transmitted by dynamically subtracting bitrate from the audio.



Each channel has its own PAD control and a space in the encoder memory where you can insert the text and images you want to transmit, this is accessible via ftp protocol using the value shown next to Source Username as a user name, this will be source1 or source2 depending on the encoding process where we are, next to the user it is possible to set a Password to control access. After you have made the login to the encoder address via ftp, a dl.txt file is shown, in this file you can insert the text you want to transmit, together with this there is a pictures folder where you can insert one or more images that will be transmitted in rotation.

The text file is read and transmitted by the encoder as a DL dynamic label or if formatted appropriately as DL+, text with tags, the images inserted in the pictures folder will be transmitted as a Slideshow, one or more files in the typical formats jpg, png, bmp, are accepted, the files will be reduced to the standard 320x240 pixel Slideshow format, the size will be reduced to a value that does not exceed 13KB to ensure a consistent transmission time.

To make the encoder interfaced with the various radio automation models easier, the RD Link software has been developed, this is capable of automatically managing the acquisition of the song's

author title and any cover so it is able to create an artwork containing the title, author, cover and broadcaster's brand, for the RD Link configuration, please refer to the specific manual.

PAD Enabled: Allows you to enable or disable sending PAD data.

Disable metadata extraction: if you choose No it allows the extraction of the streaming metadata that will then be transmitted in the Dynamic Labels, if you choose Yes the extraction from the metadata is disabled, via ftp it is always be possible to write in the text file the data to be transmitted in the DLs.

Annotate images with metadata: allows you to superimpose the DL data and the current date and time on the transmitted Slideshows using two banners placed on the top and bottom of the image.

XML Parser enabled: Allows you to enable the XML parser capable of acquiring the appropriately tagged data from a dl.xml file formatted according to the ETSI TS 102 980 standard and stored in the same folder where the dl.txt text file is present. Once the parser has decoded the dl.xml file, it will write the result in the dl.txt file, which will then be read and transmitted with the appropriate PAD data tags. The dl.xml file is reread every 3 seconds. If the file contains more than 4 tags, these are sent in maximum blocks of 4 every 4 seconds.

Skip Image on DL text change: Allows you to force the loading and immediate transmission of the image in the pictures folder if the text in the dl.txt file has changed. This allows, if the broadcaster wants to transmit artwork containing the cover of the song on air, to send the new cover as quickly as possible when the song changes on air. If this parameter is enabled, it is necessary to have only one image in the pictures folder.

PAD Bandwidth Percent: is the percentage of maximum bandwidth that will be subtracted from the audio during the transmission of PAD (program associated data), the minimum value is 5%, the maximum is 30%.

SLS Transmit Timeout: is the time that elapses between one transmission and the next of the Slideshows contained in the pictures folder, the minimum value is 20 seconds, the maximum is 120 seconds, the transmission of an image involves the commitment of the maximum percentage of bandwidth previously defined for a time that can vary from a few seconds up to 20 or more seconds, this depends on the transmission bitrate of the channel, the percentage reserved for PADs and the size of the image.

DLS Transmit Timeout: is the time that elapses between one transmission and the next of the text contained in the dl.txt file, therefore the retransmission of the text can occur with times that vary from 1 second to 10 seconds, the bandwidth commitment for this is low.

The encoder then manages the sending of text and images according to this method: the text is sent with a waiting time between one repetition and the next that varies depending on what is set in DLS Transmission Timeout, the image is retransmitted cyclically at intervals equal to the value set in SLS Transmit Timeout.

Below the configuration parameters there is a "SLS and DLS preview" window where the image and text that are currently being transmitted are shown.

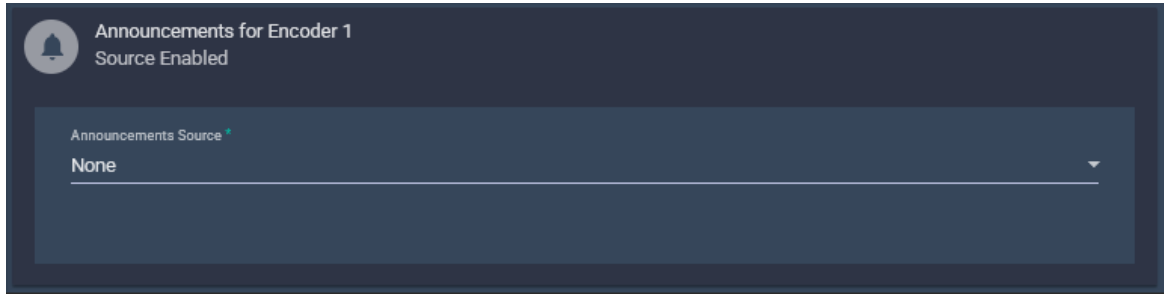
2.4.4 Announcements

In this menu it is possible to configure the announcement signalling parameters and the Linkage activation control.

These control messages are transmitted together with the audio from the encoder to the multiplexer. The multiplexer then signals announcements to receivers using ETSI Announcement Support (FIG

0/18) and Announcement Switching Information (FIG 0/19), while the Linkage control modifies the Linkage activation value transmitted in FIG 0/6.

Clicking the arrow on the right opens a drop-down menu that allows selecting the control source.



Announcements for Encoder 1
Source Enabled

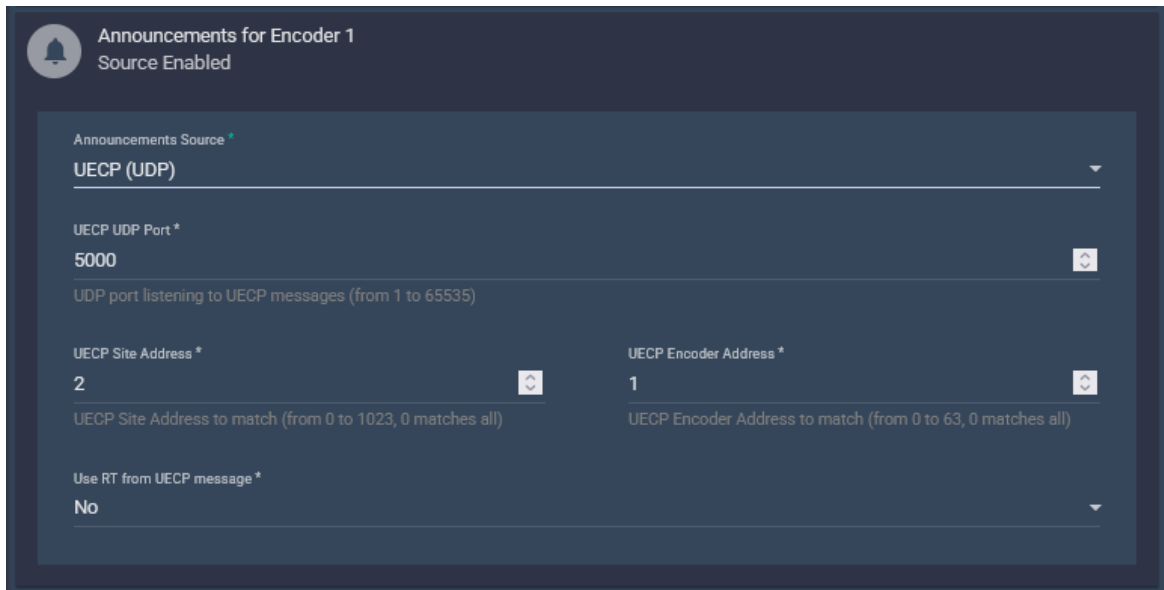
Announcements Source *

None

Announcements source: Multiple choice:

- **None:** No announcement signalling is transmitted.
- **UECP UDP:** UECP protocol via UDP socket.
- **UECP RS232:** UECP protocol via RS232 serial interface.
- **GPIO:** Uses the opto-isolated GPIO contact port on the rear of the encoder.
- **TEST:** Allows manual announcement signalling from the web interface.
- **FTP:** Uses the "Annctrl.txt" file located in the FTP root of the channel.

SOURCE UECP UDP



Announcements for Encoder 1
Source Enabled

Announcements Source *

UECP (UDP)

UECP UDP Port *

5000

UDP port listening to UECP messages (from 1 to 65535)

UECP Site Address *

2

UECP Site Address to match (from 0 to 1023, 0 matches all)

UECP Encoder Address *

1

UECP Encoder Address to match (from 0 to 63, 0 matches all)

Use RT from UECP message *

No

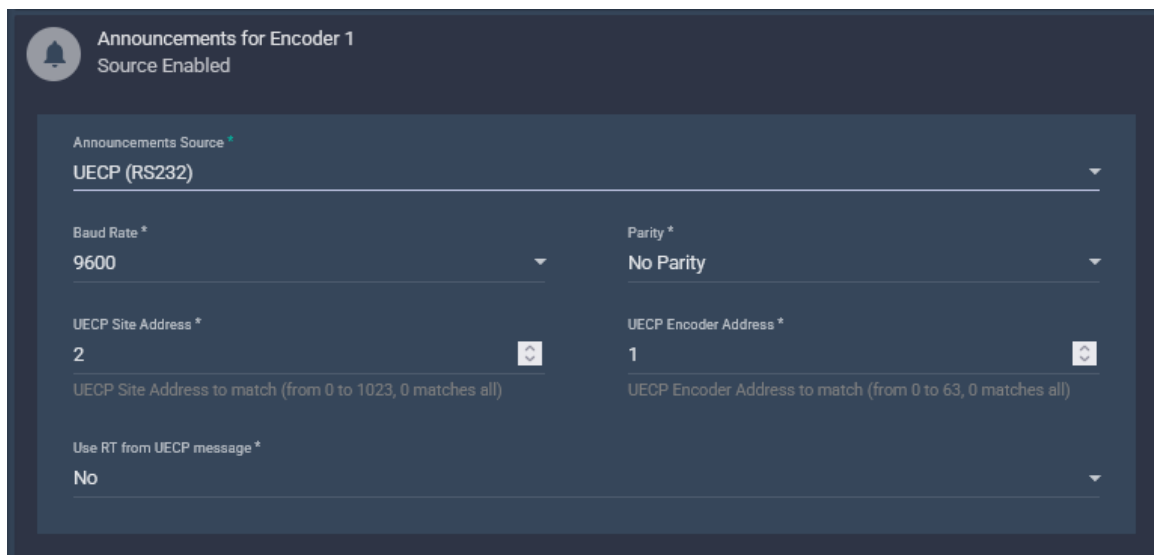
This page allows configuration of announcement signalling and Radio Text received via UECP over UDP.

UECP UDP Port: UDP port used to receive UECP messages.

UECP Site Address / UECP Encoder Address: Identifier values used for UECP source recognition.

Use RT from UECP Message: Enables extraction of RadioText from UECP messages.

SOURCE UECP RS232



Announcements for Encoder 1
Source Enabled

Announcements Source *
UECP (RS232)

Baud Rate *
9600

Parity *
No Parity

UECP Site Address *
2

UECP Encoder Address *
1

UECP Site Address to match (from 0 to 1023, 0 matches all)

UECP Encoder Address to match (from 0 to 63, 0 matches all)

Use RT from UECP message *
No

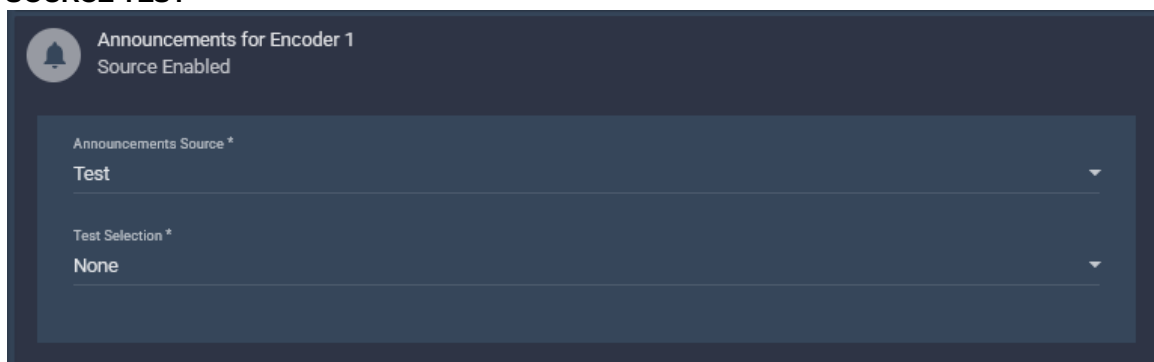
This page allows configuration of announcement signalling and Radio Text received via UECP over RS232.

Baud Rate / Parity: Baud rate and parity settings (8 data bits fixed) when using UECP over RS232.

UECP Site Address / UECP Encoder Address: Identifier values used for UECP source recognition.

Use RT from UECP Message: Enables extraction of RadioText from UECP messages.

SOURCE TEST



Announcements for Encoder 1
Source Enabled

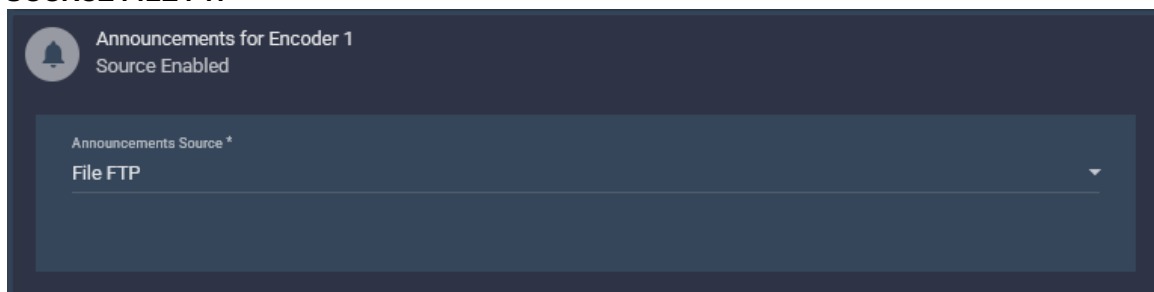
Announcements Source *
Test

Test Selection *
None

Selecting Test mode allows simulation of announcements (Alarm, Traffic, Transport, Warning, News, Weather, Event, Special Event, Programme Info, Sport, Financial) and Linkage/Split commands. These remain active until "none" is selected again.

Test Selection: Select the announcement or Linkage/Split command to simulate.

SOURCE FILE FTP



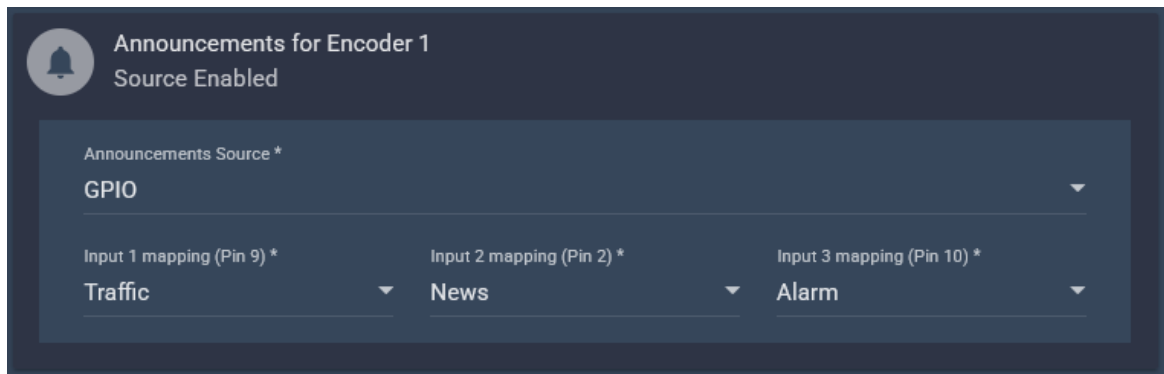
Announcements for Encoder 1
Source Enabled

Announcements Source *
File FTP

Selecting File FTP mode allows announcement signalling commands to be read from the numeric value stored in the "Annctrl.txt" file located in the FTP-accessible memory area for the channel. FTP credentials are the same used for the PAD section.

The following is the mapping between numeric values and announcement / Linkage commands:

0 ? None
1 ? Alarm
2 ? Traffic
4 ? Transport
8 ? Warning
16 ? News
32 ? Weather
64 ? Event
128 ? Special Event
256 ? Programme Info
512 ? Sport
1024 ? Financial
4096 ? Null output stream
32768 ? Linkage control / Split

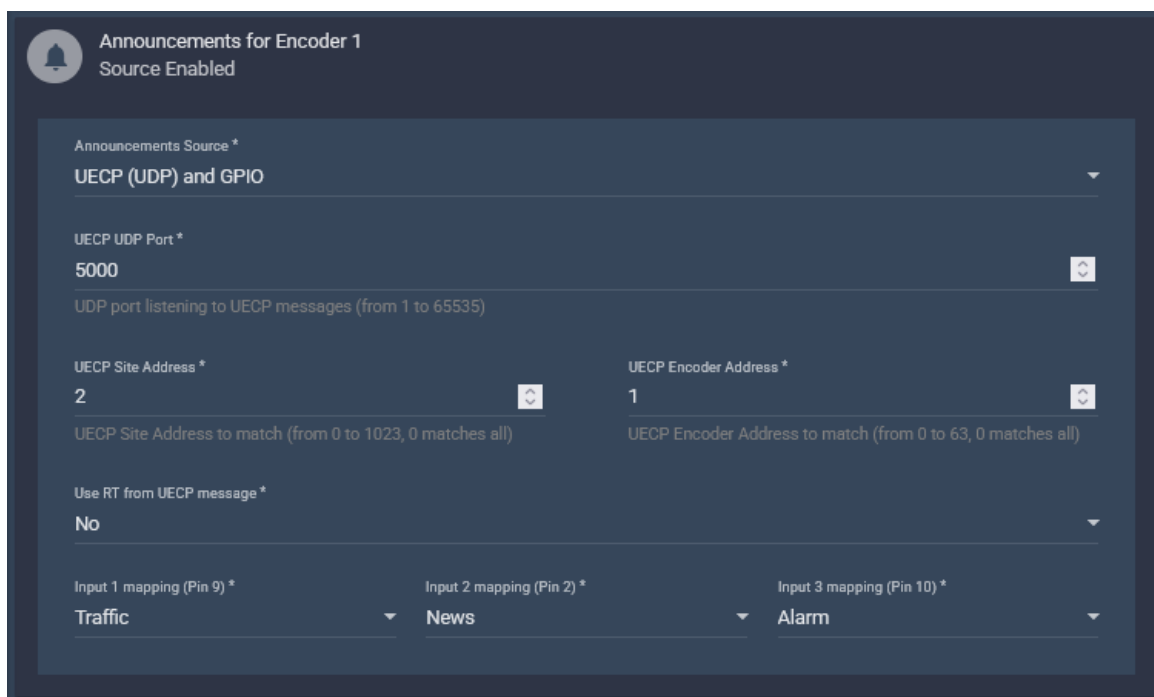


Allows using the GPIO port on the rear panel to select the announcement to transmit for the selected channel.

Each input pin can be assigned to a specific announcement or Linkage command.

The corresponding connector pin number is shown in parentheses.

See related article for the GPIO pinout.



Announcements for Encoder 1
Source Enabled

Announcements Source *
UECP (UDP) and GPIO

UECP UDP Port *
5000

UDP port listening to UECP messages (from 1 to 65535)

UECP Site Address *
2

UECP Encoder Address *
1

UECP Site Address to match (from 0 to 1023, 0 matches all)

UECP Encoder Address to match (from 0 to 63, 0 matches all)

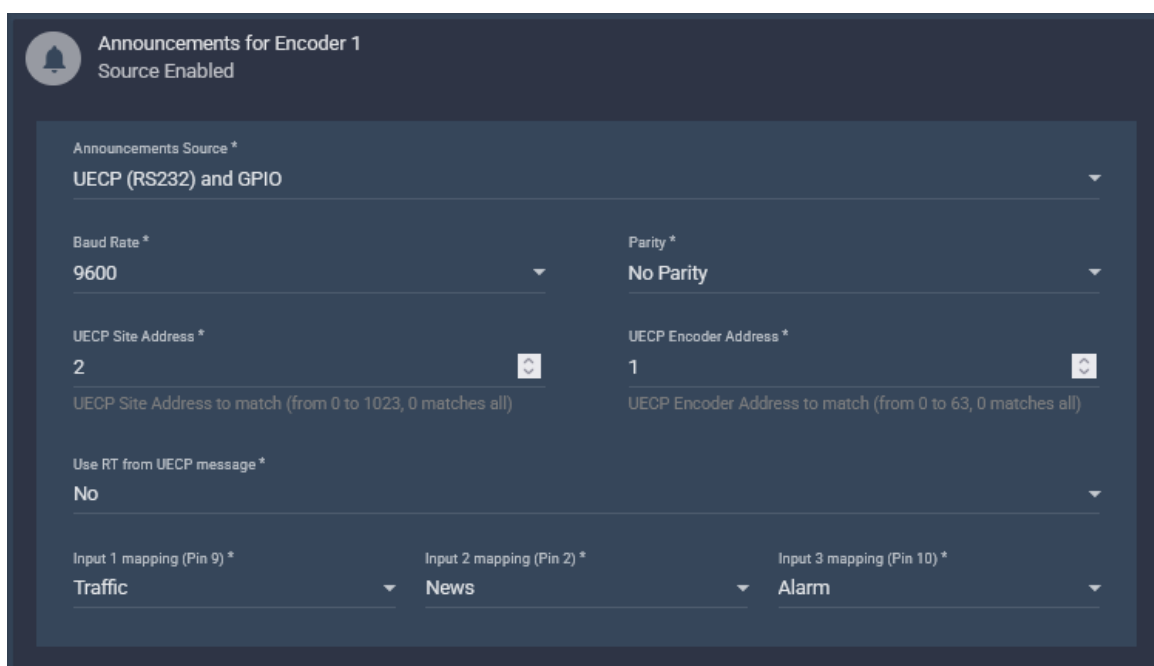
Use RT from UECP message *
No

Input 1 mapping (Pin 9) *
Traffic

Input 2 mapping (Pin 2) *
News

Input 3 mapping (Pin 10) *
Alarm

Allows simultaneous use of GPIO input signalling and UECP signalling over UDP.
Each input pin can be assigned to a specific announcement or Linkage command.
The connector pin number is shown in parentheses.
See related article for the GPIO pinout.



Announcements for Encoder 1
Source Enabled

Announcements Source *
UECP (RS232) and GPIO

Baud Rate *
9600

Parity *
No Parity

UECP Site Address *
2

UECP Encoder Address *
1

UECP Site Address to match (from 0 to 1023, 0 matches all)

UECP Encoder Address to match (from 0 to 63, 0 matches all)

Use RT from UECP message *
No

Input 1 mapping (Pin 9) *
Traffic

Input 2 mapping (Pin 2) *
News

Input 3 mapping (Pin 10) *
Alarm

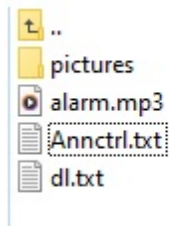
Allows simultaneous use of GPIO input signalling and UECP signalling over RS232.
Each input pin can be assigned to a specific announcement or Linkage command.
The connector pin number is shown in parentheses.
See related article for the GPIO pinout.

2.4.5 Alarm signaling management

This function allows an MP3 file to be played continuously (looped) during the transmission of the alarm announcement.

When the 'ALARM' announcement is enabled (via FTP, test or any other method), the machine can broadcast an MP3 audio file called 'alarm.mp3' if it has been previously uploaded to the FTP of the channel of interest. If the channel responsible for transmitting the alarm signal is managed via encoder 1, the corresponding audio file must be uploaded to the FTP server associated with encoder 1.

The file must be placed in the FTP ROOT, as shown in the figure:



If the file is present, it will be played in a loop for the entire duration of the ALARM signal, replacing the audio normally transmitted.

If the file is not present, the audio of the service itself will be transmitted.

When the alarm announcement is disabled, the encoder will automatically switch to the regular audio of the service in question.

2.5 Audio Processor



By clicking on the audio processor configuration icon the corresponding configuration menu will open.

The audio processor consists of a two-band AGC, one dedicated to frequencies below 200Hz, the other for the remaining audio components, a 6-band limiter, a clipper with distortion cancellation. At the end of the audio process there is Loudness limiter according to the ITU1770 standard, recommended for digital transmissions, this allows to harmonize the audio level perceived, by the user, making the channels of the multiplexer uniform listening



If there are two encoding processes in the encoder and therefore two audio processors, by clicking ENCODER1 or ENCODER2 at the top it is possible to switch from the setting parameters of the audio processor of the first encoder to that of the second and vice versa.

The top panel contains the audio processor operation indicators.

INPUT: Input Level

AGC: It displays the reduction level imposed by the two AGC, left band is the audio band from 0 to 200Hz, right band over the 200Hz

LIMITERS: 6 bands limiter values. Left bar is related to the lowest frequencies, right band the highest frequencies

ITU: Loudness limiter ITU1770 level.

OUTPUT: Process Output level.

In the menu on the top left it is possible to enable the encoder, activate or not the ITU limiter, load or save presets.

DSP Enabled: Audio Processor Enable/Disable

ITU Enabled: Enable Loudness Limiter ITU1770.

Preset on air: Shows the name of the preset on air.

Previous Preset: Shows the name of the previous preset if one parameter is changed.

Load preset: Allows you to load a previously stored preset or a factory preset.

Save preset: Allows you to save a preset.

Revert preset: Allows you to undo the changes made to an unsaved preset.

The configuration of a preset can be made by user changing the parameters in the menu: AGC, MULTIBAND, BASS EQUALIZER, ITU LIMITER.

AGC



This window contains the settings for the dual band automatic gain control (AGC) block, placed at the head of audio processing chain.

The automatic gain control performs a pre-levelling of the signal applied to the following compressors/limiters, keeping their working point almost constant.

Gate level: Gate level threshold. Below this level, the AGC and multiband limiter release is slowed down, range -50..0 dB..

Drive: indicates the AGC input driving level, thus determining the AGC maximum gain, range 0..20 dB..

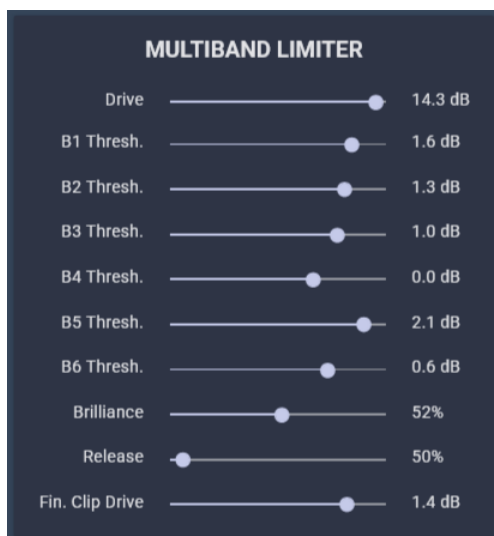
Release: AGC release time setting (40% fastest, 200% slowest).

Band Link: set the maximum compression difference between the bass and middle/highs band.

Setting this value to zero, the bass compression level will be totally independent and this will cause also a mild auto-equalization.

Setting this value to 100%, it will force the bass compressor to have a gain never greater than the middle/highs band giving a sound very close to the original.

MULTIBAND



This window contains the parameters of multiband limiter which elaborate the audio.

Drive: Multiband limiter drive level, increasing the drive the multiband increases its work increasing the loudness, range 0..15 dB.

Band Threshold: All six-bands limiters thresholds are adjustable in order to apply a dynamic equalization according to the user's taste. Lowering the limiting threshold of any band will result in attenuating the level of that band, while raising the threshold, will amplify its level, the range is -6..+3dB.

The six bands cutoff frequencies are :

B1: 100Hz and below

B2: 400Hz

B3: 800Hz

B4: 1600Hz

B5: 3200Hz

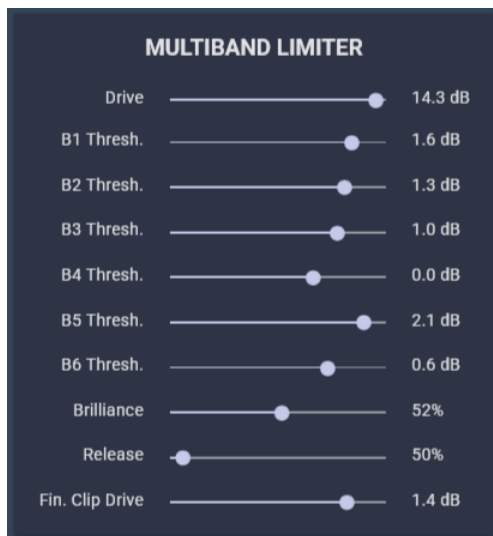
B6: 6400Hz and above

Brilliance: Set the amount of high frequency controlling the band 6, at 100% the amount of high frequency is the same, reducing this value till 0 the amount increases.

Release: Multiband limiter release time, (40..200) lower values reduce the release time increasing the loudness.

FinalClip Drive: Set the wideband final clipper driving level. Higher driving level corresponds to higher loudness, but will cause higher distortion, to reduce distortion we have introduced a particular new algorithm of distortion cancelling.

BASS EQUALIZER



In this menu it is possible to process the low frequencies, highlighting particular frequencies and extending their duration over time.

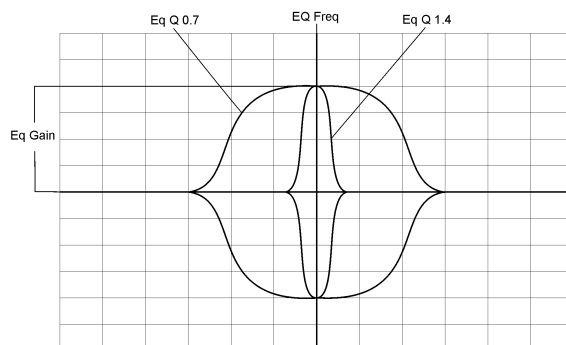
Frequency: Parametric equalizer center frequency, this frequency can be attenuated or amplified, range 20..150 Hz.

Gain: Gain (boost) of parametric equalizer, range -6..+6 dB..

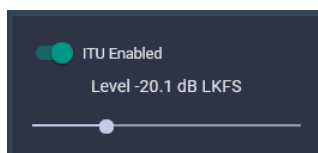
Qfact: Q-factor (bandwidth) of parametric equalizer.

Punch (0..2): Punch enhancer (0 off, 2 max). Give some nice "analog-style" bass enhancing.

Clip Thresh: Bass clipper threshold. Increasing the value the bass frequency will be controlled make by clipping, reducing the value the control will be made by compressor.



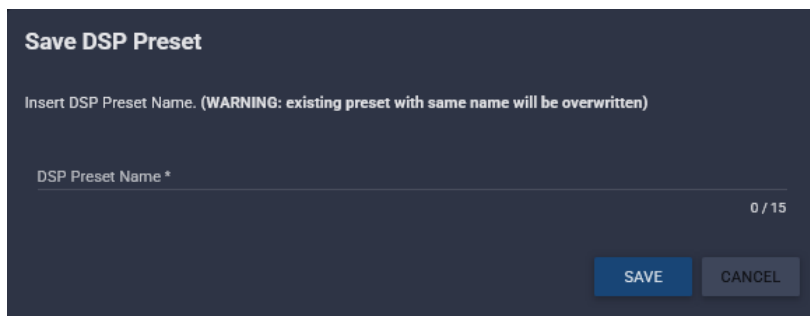
ITU LIMITER



In this menu it is possible to set the loudness limiter, this allows to harmonize the loudness of the various programs present in the multiplexer so as to have a passage from one content to another without significant volume jumps, normally we recommends a value between - 15 and -10 dB LKFS

The changes on the values will be applied automatically in a time less of one second, it's important remember if we are listening the on air signal that there is a latency of 2 seconds due to encoding, multiplexing and GPS synchronization, so when we change a parameter on audio processor the effect on audio will be heard after 3 seconds.

Once our preset has been created by clicking SAVE PRESET a window will appear where you can enter the name of our new preset, then clicking save will close the window and the preset will be saved.



Save DSP Preset

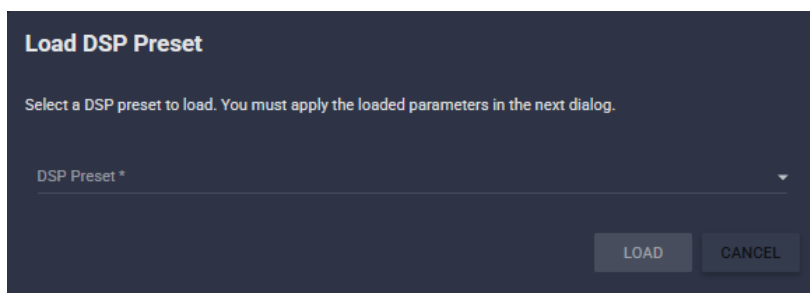
Insert DSP Preset Name. (WARNING: existing preset with same name will be overwritten)

DSP Preset Name *

0 / 15

SAVE CANCEL

If we want load a preset, is necessary click LOAD PRESET. a new window will open and here we can select the name of the preset.



Load DSP Preset

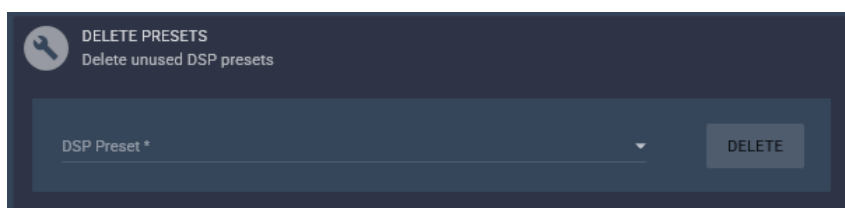
Select a DSP preset to load. You must apply the loaded parameters in the next dialog.

DSP Preset *

LOAD CANCEL

Selected the preset click LOAD and this window will close.

If is necessary delete a preset is possible to make it going in the [Maintenance Menu](#).



DELETE PRESETS

Delete unused DSP presets

DSP Preset *

DELETE

Select the preset name to delete and click DELETE, the preset will be removed permanently.

2.6 Networking



This menu allows you to modify the data of the network interface using the following parameters:

NETWORK CONFIGURATION
IPv4 Network parameters - eth0

IP Address *

192.168.1.61

Insert a valid IP address

Netmask *

255.255.255.0

Insert the network mask

Gateway IP Address

192.168.1.254

Insert the gateway IP address

DNS CONFIGURATION
Name Servers Configuration

Primary DNS IP address *

8.8.8.8

Insert a valid IP address

Secondary DNS IP address

8.8.4.4

Insert a valid IP address

NTP CONFIGURATION
Network Time Configuration

☐ NTP Default Servers

NTP Server #1 *

ntp1.inrim.it

Insert a valid IP address or domain name

NTP Server #2

ntp2.inrim.it

Insert a valid IP address or domain name

NTP Server #3

time.inrim.it

Insert a valid IP address or domain name

NTP Server #4

Insert a valid IP address or domain name

NTP STATUS
Network Time Peers Status

remote	refid	st	t	when	poll	reach	delay	offset	jitter
*193.204.114.232 .CTD.		1	u	1046	1024	377	23.830	0.817	2.166
+193.204.114.233 .CTD.		1	u	1000	1024	367	23.831	0.833	1.350
+193.204.114.105 34.152.228.32		2	u	699	1024	377	23.616	0.954	5.186

NETWORK CONFIGURATION

IP Address eth0: IP address

Netmask eth0: Netmask

Gateway eth0: Gateway

DNS CONFIGURATION

Primary DNS IP Address: Primary DNS.

Secondary DNS IP Address: Secondary DNS.

NTP CONFIGURATION

This menu offer you the possibility to specify the addresses of the NTP servers necessary to the Encoder to synchronize the time and the clock, changing the NTP Default Servers from Yes to No you can specify up to four addresses, if you leave the choice in Yes the system search automatically the 4 NTP servers.

In the **NTP STATUS** menu is shown the actual status of the NTP servers contacted, the asterisk character " * " present before the name of the server denotes the server currently in use, it's important to verify, particularly the first time you start the Encoder, the presence of the servers in this page and the presence of the asterisk before one of these.

If in this page the server will not be showed after 5 minutes from Encoder startup, is necessary verify the network configuration and in particular the access to internet to the port 123 in Udp protocol.

2.7 Alarms



ALARMS

In this menu it is possible to configure the parameters required for sending alarm emails and to define the system conditions that generate alarms.

ALARMS CONFIGURATION
 Service Alarms Settings

☒ Enable System Alarms via Email

ALARMS CONFIGURATION
 Level Check Alarms Settings

☒ Enable Level Check

Level Threshold (dB) *
 -50
From 0 to -90dB, audio below this level generates warnings

Level Check Interval (seconds) *
 20
Interval in seconds to measure audio average level

ALARMS CONFIGURATION
 SMTP Settings

Encoder Description *
 DAB Encoder
Encoder description shown on alarm Emails

11 / 128

SMTP Port *
 465
SMTP Server TCP port (from 1 to 65535)

SMTP Username
 mail@example.com
Username for SMTP authentication

16 / 128

SMTP requires SSL *
 Yes

SMTP Server *
 smtps.aruba.it
SMTP Mail Server, IP Address or hostname.

14 / 256

SMTP Authentication *
 Yes

SMTP Password

Password for SMTP authentication

11 / 128

Sender Email Address *
 mail@example.com
SMTP sender Email Address

16 / 256

TEST SMTP SERVER

Recipient #0
 Email destination address

Destination Email Address *
 destination@domain.com
Destination Email Address

22 / 256

In case of an input fault, if "Enable System Alarms via Email" is set to Yes, an alarm email is generated and sent to all configured recipients. The same notification is also sent if the fan stops or if the internal temperature of the unit exceeds 65 degrees Celsius.

Fan, temperature, or power supply faults are also logged in the system logs, managed through

SNMP, and indicated visually on the front panel by the red ALARM LED.

Enable System Alarms via Email: enables or disables the sending of alarm emails related to the two encoded channels.

Level Check Alarm Settings

If the encoding process uses an analog, digital, or streaming audio source, and the audio level of one of the two channels falls below the threshold defined in **Level Threshold** for a period longer than the value set in **Level Threshold Interval**, an email will be sent indicating which channel experienced the audio loss. The event will also be indicated by the yellow LED on the front panel corresponding to the encoder process in alarm, as well as through email, SNMP, and log notifications.

Encoder Description: the name of the DAB encoder that will appear in the alarm email.

SMTP Server: the address of the SMTP server used for sending emails.

SMTP Port: the TCP port used by the SMTP server.

SMTP Authentication: enables or disables authentication with Username and password on the SMTP server.

SMTP Username: the Username required for authentication.

SMTP Password: the password required for authentication.

SMTP Requires SSL: enables or disables SSL encryption for the SMTP connection.

Sender Email Address: the email address used as the sender when sending alarm messages.

TEST SMTP SERVER: by pressing this button, a test email is sent to all configured addresses to verify correct operation.



By pressing the red "+" button, new email recipients can be added.

Destination Email Address: specifies the email address to which alarm notifications are sent.

2.8 Snmp



In this menu it is possible to configure the device's SNMP agent.

In the Maintenance menu it is possible to download the MIB file containing all available parameters for SNMP monitoring, such as the status of NTP servers used for synchronization, encoder configuration, audio level of each channel and process, fan speed, temperature and CPU load, and connection socket status.

Enable SNMP agent: enables or disables the device's SNMP agent service.

SNMP Community: This is the community string that an SNMP manager must use to access the device.

SNMP Port: This is the UDP port used by the device to serve SNMP requests. Port 161 is typically used.

By clicking the "+" button, you can define one or more SNMP Trap destinations:



Enable TRAP destination: enables or disables the transmission of traps to the specified destination.

Host: the IP address or hostname of the Trap receiver (SNMP manager) configured to receive traps from the encoder.

Community: This is the community string the encoder uses when sending a trap. It must match the one expected by the Trap receiver.

SNMP Trap Dest. Port: This is the UDP port on the SNMP manager where alarm traps are sent (typically port 162).

Send SNMP Test Trap: By clicking this button, a test SNMP trap is sent to all configured destinations.

Traps are sent in the following cases:

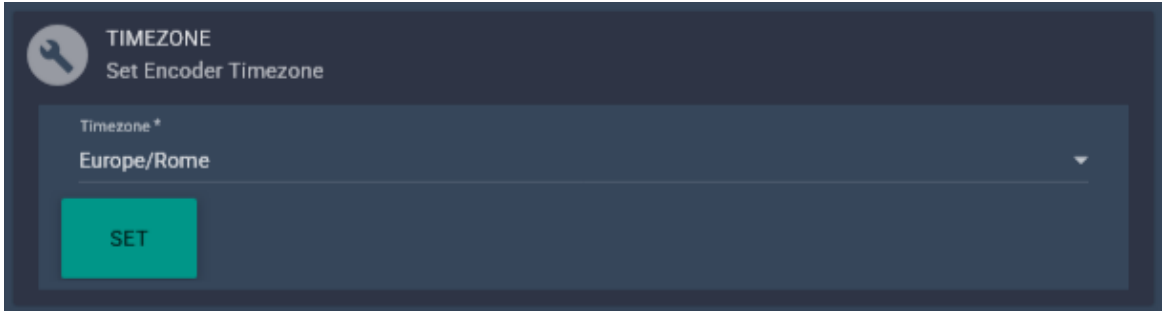
- Generic system error.
- The audio level of one channel falls below the configured threshold for longer than the selected time period.
- A destination socket of the EDI stream is disconnected.
- Fan malfunction detected.
- CPU temperature exceeds 65°C.

2.9 Maintenance

MAINTENANCE

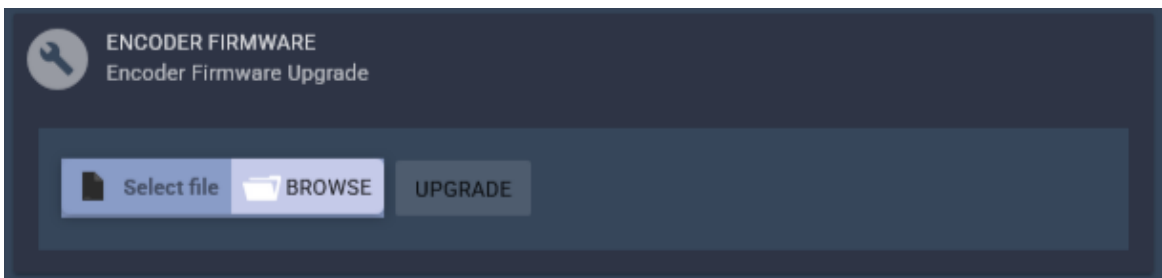
The maintenance menu provides the following features:

Time zone: time zone selection.



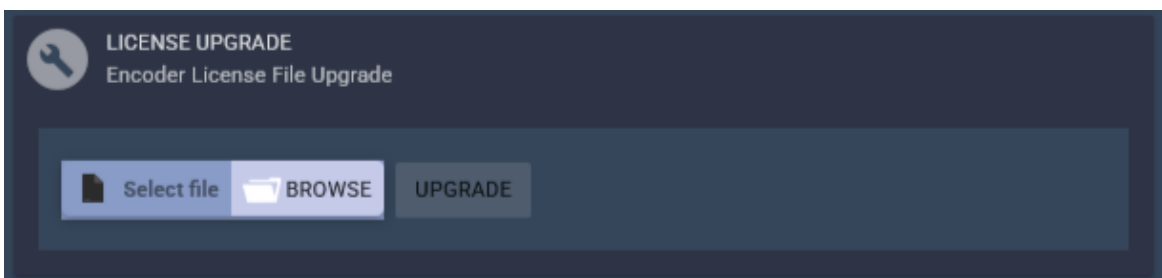
The screenshot shows the 'TIMEZONE' configuration page with the subtitle 'Set Encoder Timezone'. It features a dropdown menu labeled 'Timezone *' with 'Europe/Rome' selected. A green 'SET' button is located below the dropdown.

Encoder Firmware: allows you to update the system firmware. By clicking “Browse”, a window opens where you can search for the file containing the new firmware. Once selected, click “Update” and wait for the system to reboot.



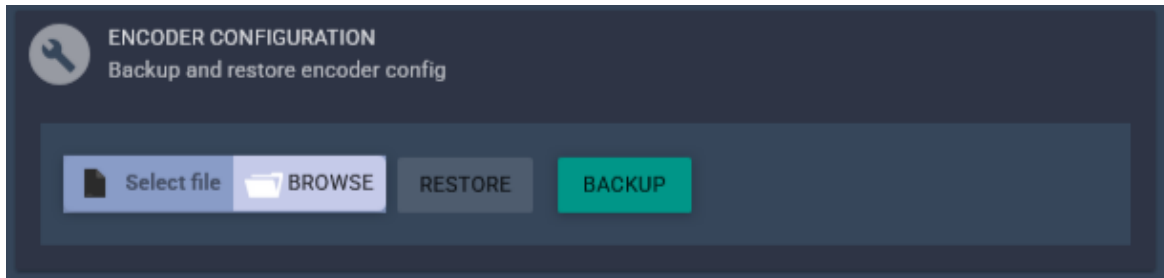
The screenshot shows the 'ENCODER FIRMWARE' configuration page with the subtitle 'Encoder Firmware Upgrade'. It contains three buttons: 'Select file' (with a document icon), 'BROWSE' (with a folder icon), and 'UPGRADE'.

License Upgrade: allows you to upgrade the license, enabling up to two channels, the audio processor, and high-quality encoding.



The screenshot shows the 'LICENSE UPGRADE' configuration page with the subtitle 'Encoder License File Upgrade'. It contains three buttons: 'Select file' (with a document icon), 'BROWSE' (with a folder icon), and 'UPGRADE'.

Encoder configuration: allows you to save the encoder configuration to a file by clicking the “Backup” button and to load a configuration file using the “Restore” button. When saving or restoring parameters, the network configuration addresses will also be updated.

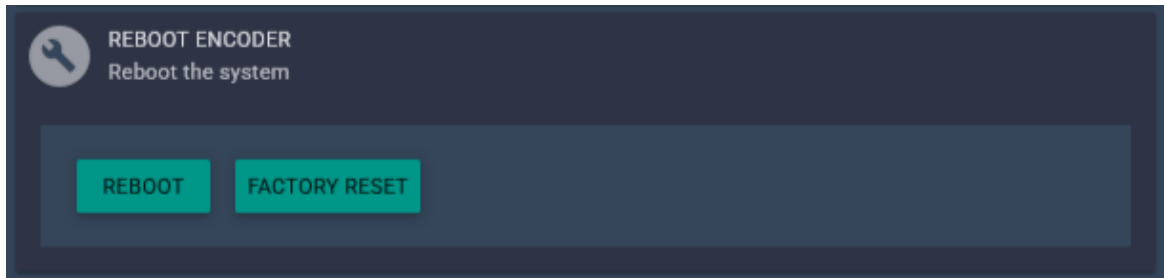


ENCODER CONFIGURATION
Backup and restore encoder config

Select file BROWSE RESTORE BACKUP

Reboot: allows you to reboot the machine.

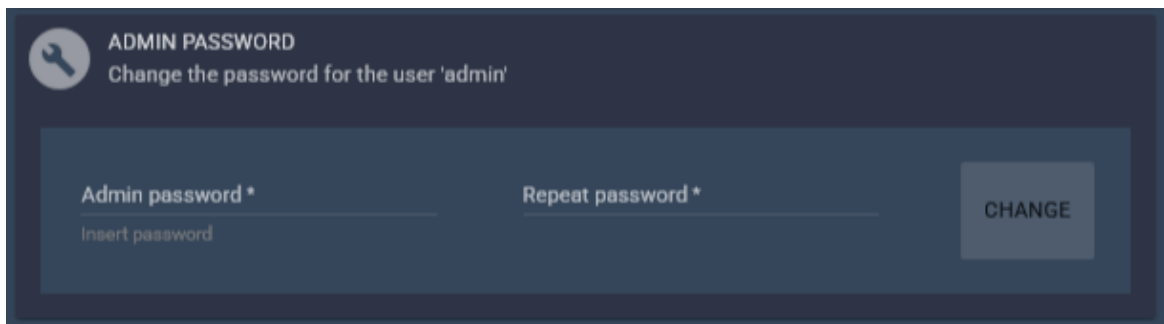
Factory Reset: resets the encoder to factory settings while keeping the configured network address.



REBOOT ENCODER
Reboot the system

REBOOT FACTORY RESET

Admin password: allows you to change the system administrator password.



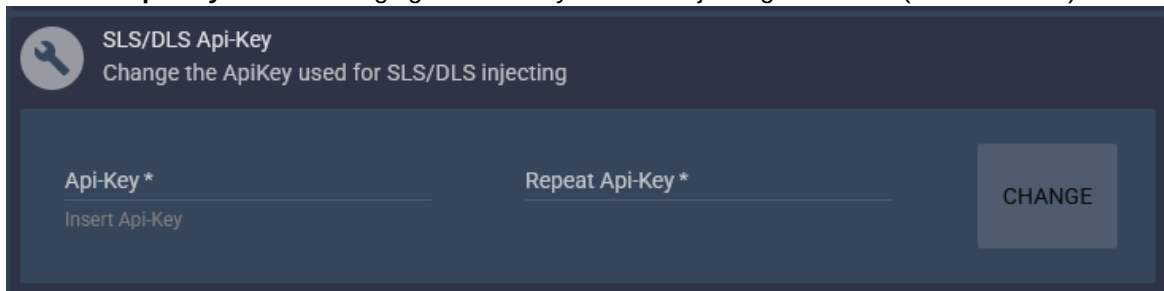
ADMIN PASSWORD
Change the password for the user 'admin'

Admin password * Repeat password *

Insert password

CHANGE

SLS/DLS Api-Key: allows changing the API Key used for injecting PAD data (SLS and DLS)



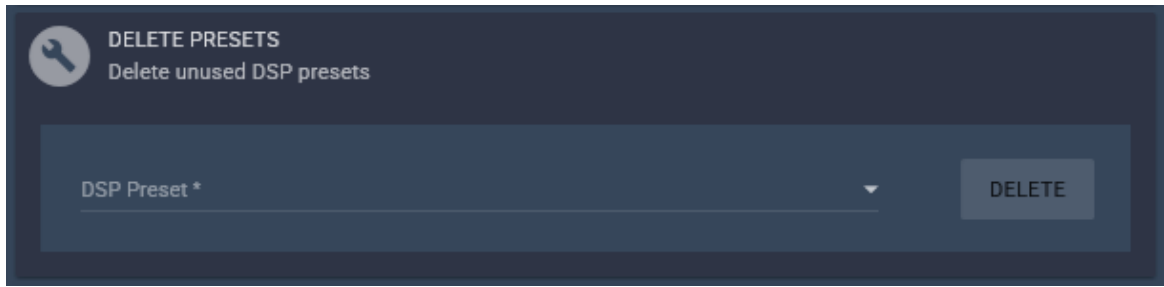
SLS/DLS Api-Key
Change the ApiKey used for SLS/DLS injecting

Api-Key * Repeat Api-Key *

Insert Api-Key

CHANGE

Delete Presets: allows you to delete the audio processor presets.



DELETE PRESETS
Delete unused DSP presets

DSP Preset * ▼ DELETE

License: contains the information related to the license installed on the product:

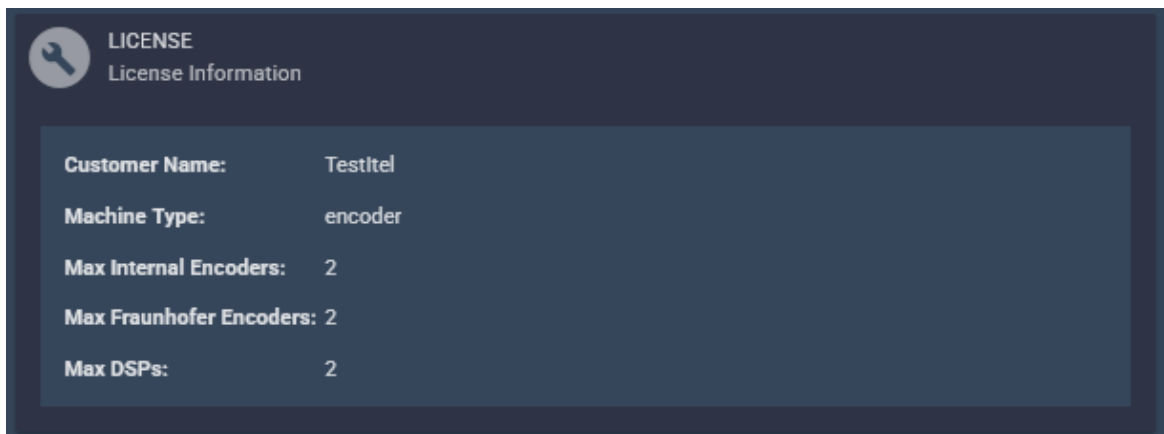
Customer Name: name to which the license is registered

Machine Type: the product type

Max Internal Encoders maximum number of available encoders

Max Fraunhofer Encoders maximum number of encoders that can use high-quality Fraunhofer encoding

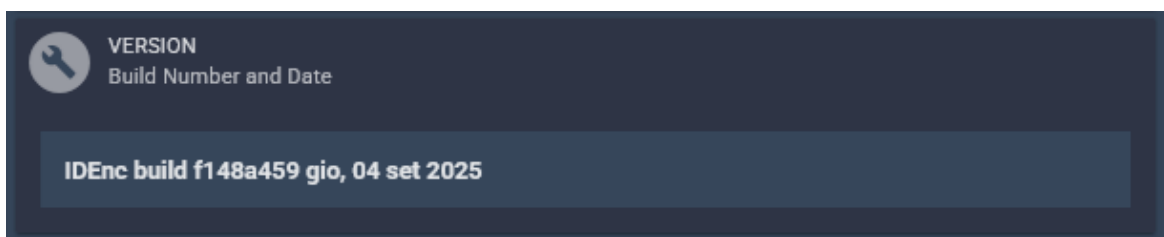
MAX DSPs: maximum number of available audio processors.



LICENSE
License Information

Customer Name:	Testitel
Machine Type:	encoder
Max Internal Encoders:	2
Max Fraunhofer Encoders:	2
Max DSPs:	2

Version: is the version of the build installed on the encoder and its creation date.



VERSION
Build Number and Date

IDEnc build f148a459 gio, 04 set 2025

Serial number: encoder serial number



SERIAL NUMBER
Encoder Serial Number

25-ENC-1235

Snmp mib and documentation: by clicking the link below, a page opens from which you can download the SNMP MIB, the manual in Italian and English, and other documentation related to the encoder.



SNMP MIB AND DOCUMENTATION
Link to SNMP MIB and Documentation

[Click Here](#)

2.10 Alarms Log



This section presents a list of all alarms recorded during the operational lifecycle of the encoder. The alarm log is retained in internal memory for diagnostic and maintenance purposes.

Alarms History

[DOWNLOAD CSV](#)
[CLEAR HISTORY](#)

Name	Alarm Start	Alarm End
Redundant PSU	2025-08-26 12:29:17	2025-08-26 17:56:24
Audio Levels	2025-08-26 17:59:34	2025-08-26 18:00:29
Audio Levels	2025-08-26 18:01:19	2025-08-26 18:01:44
Fan	2025-08-26 18:26:32	2025-08-26 18:27:09
Redundant PSU	2025-08-26 18:28:08	2025-08-26 18:28:43
Audio Levels	2025-08-26 18:29:54	2025-08-26 18:31:28
Destinations	2025-08-26 18:35:13	2025-08-26 18:36:10
Destinations	2025-08-26 18:41:14	2025-08-26 18:47:06
Destinations	2025-08-26 18:47:51	2025-08-26 18:49:12
Destinations	2025-08-26 19:00:57	2025-08-26 19:01:04

Alarms Active

Audio Levels	OK	
Fan	OK	
Redundant PSU	OK	
Temperature	OK	
Destinations	Out 2 disconnect on source 1	
NTP Client	OK	

Alarm History

In the following table, each alarm entry shows its identifying name, start time, and end time.

At the top right, there are two buttons with the following functions:

Download CSV: allows you to download the alarm list in CSV format.

Clear History: allows you to clear the list of stored alarms.

Alarm Active

Displays, through an indicator (green = no alarm, red = alarm), the alarm status of the following components:

Audio Levels: Alarm triggered when the audio level remains below the set threshold for longer than the configured time. These parameters can be configured in the Alarms Mail menu.

Fan: Indicates whether the fan is operating or not.

Redundant PSU: Shows the redundancy status of the two power supplies. If redundancy is unavailable, a fault is declared.

Temperature: Alarm triggered when the internal temperature exceeds 60°C.

Destinations: Alarm triggered when a destination is disconnected. The disconnected destination is shown along with the encoding channel it belongs to.

NTP Client: Alarm triggered when no validated and synchronized NTP server is available, indicating a lack of time reference.

2.11 System status



The system status menu displays parameters relating to the hardware platform and encoding processes, as well as an Event Log window showing a list of events with time references, event types and severity.

Events Log

Date	Message	Type	Severity
2025-09-16 10:42:20	PAD Process 1 started	PAD	OK
2025-09-16 10:42:20	PAD Process 2 started	PAD	OK
2025-09-16 10:42:32	Encoder 1 has started	ENC	OK
2025-09-16 10:42:32	Encoder 2 has started	ENC	OK
2025-09-16 10:42:58	Encoder 2 (virgin), EDI TCP socket disconnected 192.168.1.144:80...	NETWORK	WARNING
2025-09-16 10:47:16	NTP sync ok	NETWORK	OK
2025-09-16 10:54:13	Encoder 2 (virgin), EDI TCP socket connected 192.168.1.144:8001 ...	NETWORK	OK
2025-09-16 10:54:13	Encoder 2 (virgin), EDI TCP socket disconnected 192.168.1.144:80...	NETWORK	WARNING
2025-09-16 12:51:39	Encoder 2 (virgin), EDI TCP socket connected 192.168.1.144:8001 ...	NETWORK	OK
2025-09-16 12:51:39	Encoder 2 (virgin), EDI TCP socket disconnected 192.168.1.144:80...	NETWORK	WARNING

System status

Fan speed (RPM)	8490
CPU Temperature (°C)	52
PSU Status	PSU status OK
System uptime	13 days, 6:56:16
Encoder 1 uptime	0:10:40
Encoder 2 uptime	0:11:35

Fan Speed: indicates the rotation speed of the internal fan. If the CPU temperature exceeds 55 degrees, the speed is increased until the temperature drops.

CPU Temp: CPU temperature. When it exceeds 65°C, an alarm is generated both via SNMP trap and email. The alarm is also reported in the log menu.

PSU Status: Shows the redundancy status of the two power supplies. If redundancy is unavailable, a fault is declared. The event is notified via trap, email, and event log.

Sys Uptime: indicates the time elapsed since the encoder was powered on.

Encoder 1 Uptime: indicates the time elapsed since the first encoding process was started.

Encoder 2 Uptime: indicates the time elapsed since the second encoding process was started.

Section

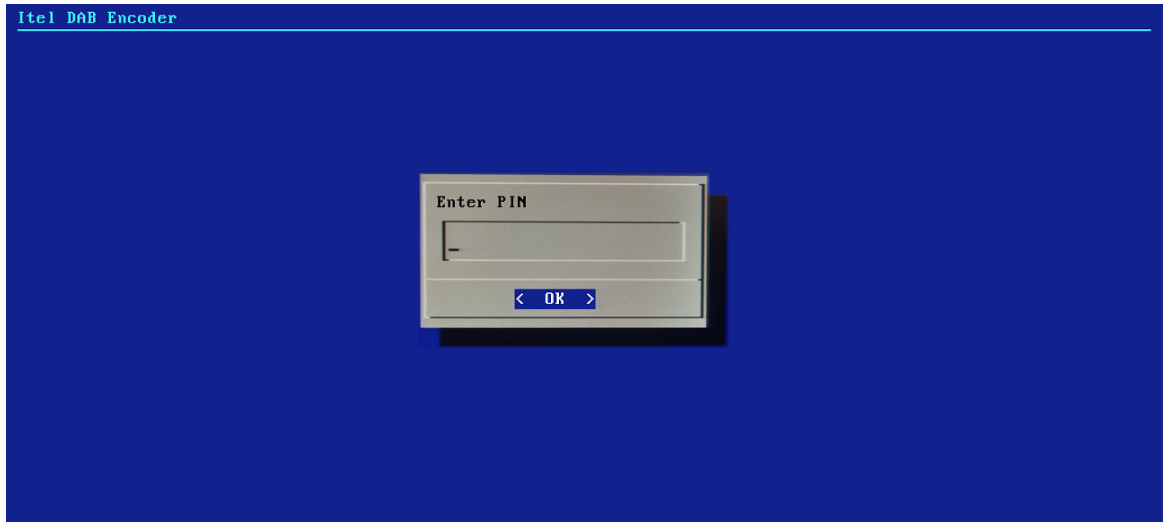
Recovery

3

3 Recovery

The recovery function is a system user interface reachable through the use of a monitor and a keyboard connected to the rear connectors, USB/PS2 for the keyboard and VGA / HDMI for the monitor.

If the administrator password is lost or if the IP address of the Ethernet interface is forgotten, it is possible to access the system parameters via this menu and then proceed to reset the password.



3.1 Menu and factory reset

At startup, the Recovery page requires a PIN code. Enter the default value 1234 (or the one modified through the "Change PIN" option, if changed) and press Enter. Then, a window will appear showing the following available options. To select one, use the arrow keys and press Enter:

Platform information: provides the system license data.

Services status: shows the status of the running services, that is, the enabled encoders.

Networking setup: allows modification of the IP addresses of the two Ethernet interfaces and the DNS settings.

Issues escalation setup: allows configuration of the alarm email sending parameters.

Admin password set: allows changing the administrator password for web access.

Change PIN: allows changing the PIN code required to access the Recovery interface (if this code is lost, access to the Recovery interface will no longer be possible).

Factory reset: resets the system to its default parameters.

Section

API Control Interface

4

4 API Control Interface

It is possible to control some encoder functions using HTTP APIs, protected by the use of an API Key.

Supported APIs:

- SLS Injection
- DLS Injection

4.1 SLS Injection

This endpoint allows for the sending, dynamic updating, and removal of Slideshow (SLS) images

Endpoint: /dlssls/pushSls

Method: POST

Content-Type: application/json

Authentication (API Key):

Requests must be authenticated by including the valid security key configured on the encoder in the HTTP header:

- **Required HTTP Header:** DlsSls-API-Key

- **Default API Key:** R7X9M4W2B1P8F5K3N6J9V0

Note: The security key can be customized by the user within the "Maintenance" menu.

JSON Payload Structure:

channelNumber (*Number*): indicates the numeric index of the destination channel (allowed range from 1 to 2).

slsFileName (*String*): defines the image file name including the extension to be loaded into the encoder (e.g., "myRadio.bmp").

slsDataB64 (*String*): contains the binary image data (e.g., bitmap), encoded in Base64 string format.

delete (*Boolean*): logical control flag. If set to **true**, it instructs the system to delete the image with the name specified in *slsFileName*; in this scenario, the *slsDataB64* field is ignored ("don't care").

Automatic Overwrite Logic:

By sending multiple consecutive requests containing the same value in the *slsFileName* field on the same channel, the system will automatically overwrite the old image with the new binary data received, without the need for prior deletion.

API Responses:

- **HTTP 200 (OK):** the request was processed successfully. A JSON confirmation object is returned: {"result": "OK"}.

- **HTTP 400 (Bad Request):** if the request does not contain a valid JSON payload, the API responds with the error "Must submit json".

4.2 DLS Injection

This endpoint allows for the sending and dynamic updating of DLS (Dynamic Label Segment - scrolling text on the radio display) texts

Endpoint: /dlssls/pushDls

Method: POST

Content-Type: application/json

Authentication (API Key):

Requests must be authenticated by including the valid security key configured on the encoder in the HTTP header:

- **Required HTTP Header:** DlsSls-Api-Key

- **Default API Key:** R7X9M4W2B1P8F5K3N6J9V0

Note: The security key can be customized by the user within the "Maintenance" menu.

JSON Payload Structure:

channelNumber (*Number*): indicates the numeric index of the destination channel (allowed range from 1 to 2).

dlsString (*String*): contains the plain-text string to be transmitted as a DLS message (e.g., "Artist - Song Title"). The system processes and internally writes the text using UTF-8 character encoding.

API Responses:

- **HTTP 200 (OK):** the request was processed successfully. A JSON confirmation object is returned: {"result": "OK"}.

- **HTTP 400 (Bad Request):** if the request does not contain a valid JSON payload, the API responds with the error "Must submit json".

