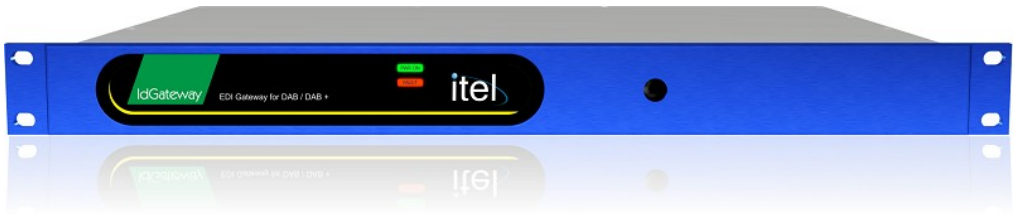
IdGateway

DAB/DAB+ EDI Gateway

User's manual



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Section 1

Introduction

1 Introduction

The system is supplied in a one rack unit steel container, equipped with two Gigabit LAN interfaces through which it can be connected to the Internet, administered via an integrated webserver and connected to the DAB transmitter.
The machine integrates an EDI stream transcoding and buffering system which allows the transport in Tcp format on public networks and the reconstruction of the EDI stream in Udp format ready to feed the DAB transmitter. During the transcoding operation, the Time Stamp associated with the frames and their numbering are kept unchanged, this allows the creation of isofrequency networks where the transmitters can either be connected directly to the multiplexer via radio links, or powered via a gateway and therefore the internet.
The configuration interface that will be presented below allows the gateway to be started in just a few steps.
It is advisable to place the system in an environment free from dust and humidity so as to guarantee maximum duration, the temperature range which guarantees perfect and continuous operation is between 5°C and 45°C.

1.1 Revisions

1.1.0	10/09/2017	First edition
1.2.0	14/03/2021	Second edition
2.0.0	22/11/2022	Third edition
2.1.0	28/06/2023	Fourth edition
3.0.0	22/10/2024	Fifth 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

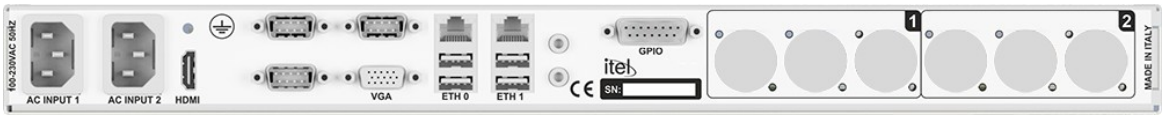
Leds on front panel

PWR ON — Power On: The gateway is powered and is working.

FAULT — Fault: Alarm active if one power supply is not working or the recepton EDI process is not working.

1.4 Rear Panel

Rear view

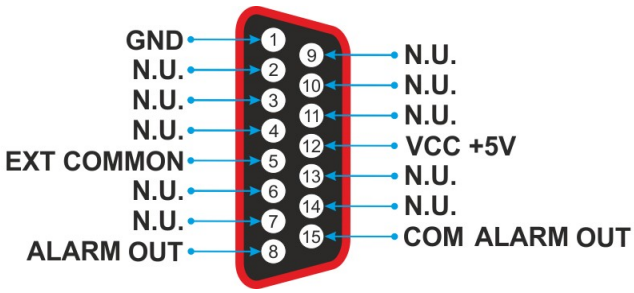


Rear connectors

- AC INPUT 1 Power connector 100-240VAC 50-60Hz
- AC INPUT 2 Power connector 100-240VAC 50-60Hz
- HDMI Only for Recovery function
- VGA Only for Recovery function
- USB Only for Recovery function
- ETH 0 Ethernet connector RJ45
- ETH 1 Ethernet connector RJ45
- GPIO Remote control connector DB15-F

1.5 GPIO connector

The GPIO connector allows to monitor and control the gateway through contacts



PIN	Description
1	GND
2	NOT USED
3	NOT USED
4	NOT USED
5	EXTERNAL COMMON
6	NOT USED
7	NOT USED
8	ALARM OUT
9	NOT USED
10	NOT USED
11	NOT USED
12	VCC +5V
13	NOT USED
14	NOT USED
15	COMMON ALARM

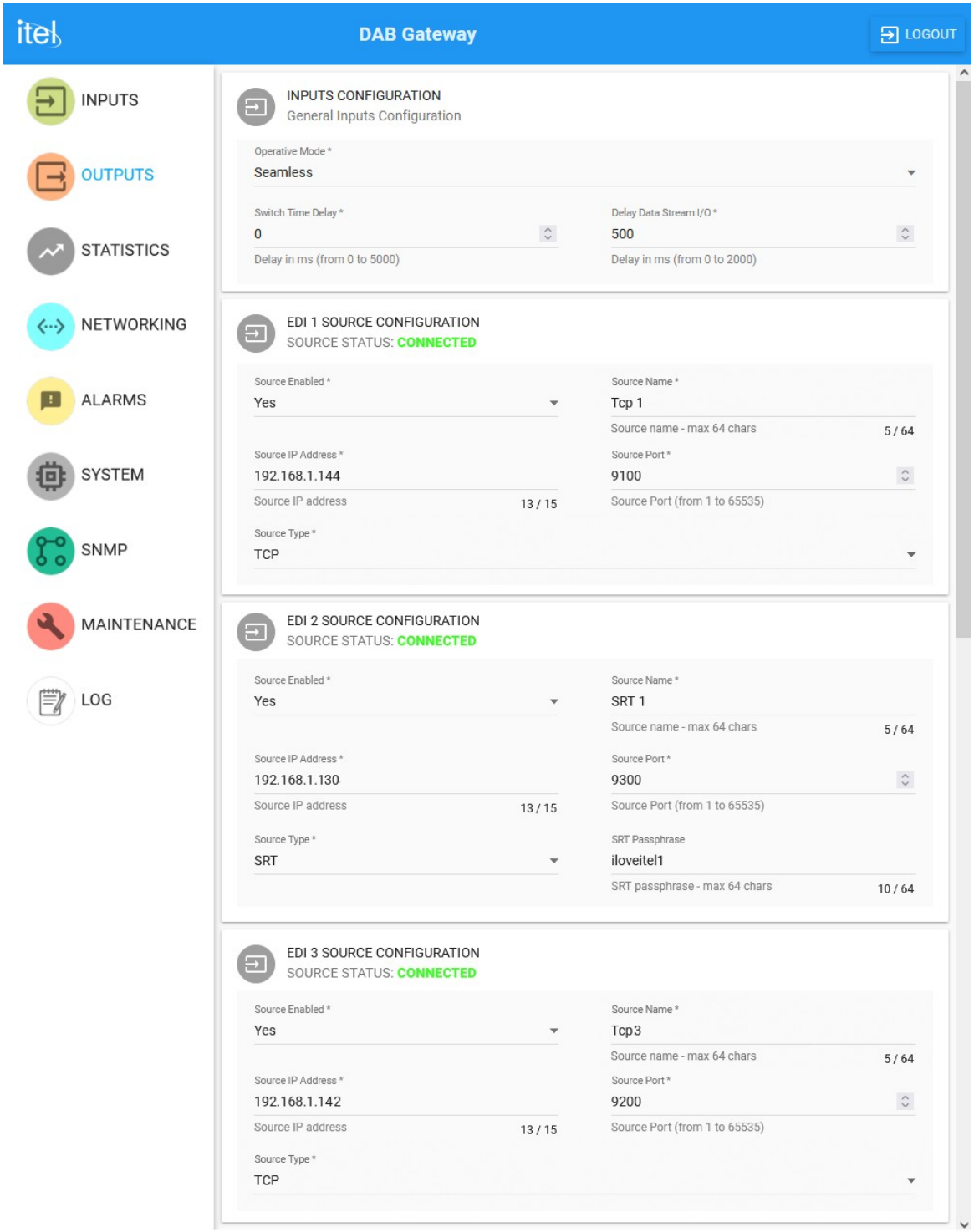
The common alarm and alarm out contact is closed in the event of an active alarm.

Section 2

Configuration

2 Configuration

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

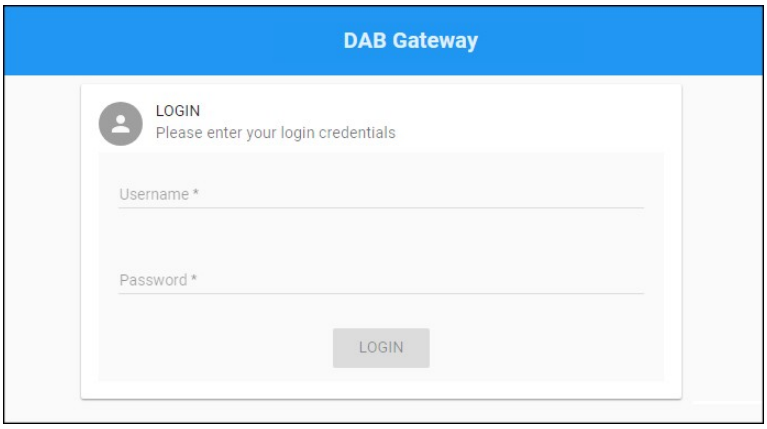


2.1 Start Up

Connect the Ethernet port of the IdGateway using a LAN cable to your local network, select an IP address 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.

Alternatively, if you want to configure the Gateway address without a network connection, refer to the Recovery section.

2.2 Login



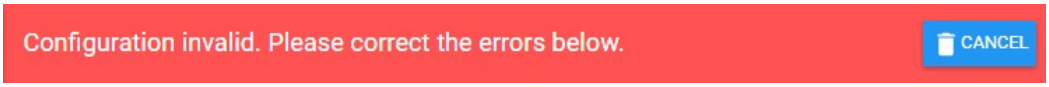
At the first start the credentials to access are:
Username: admin
Password: admin

Once inserted, click with the left mouse button on the LOGIN key, the configuration interface will shortly be loaded and we will be in the Input section.
The configuration interface consists of a menu on the left of your screen from which you can select the various topics to edit, in the other on the right there is the button to log out in order to exit the configuration.

2.3 Edit And Save Parameters

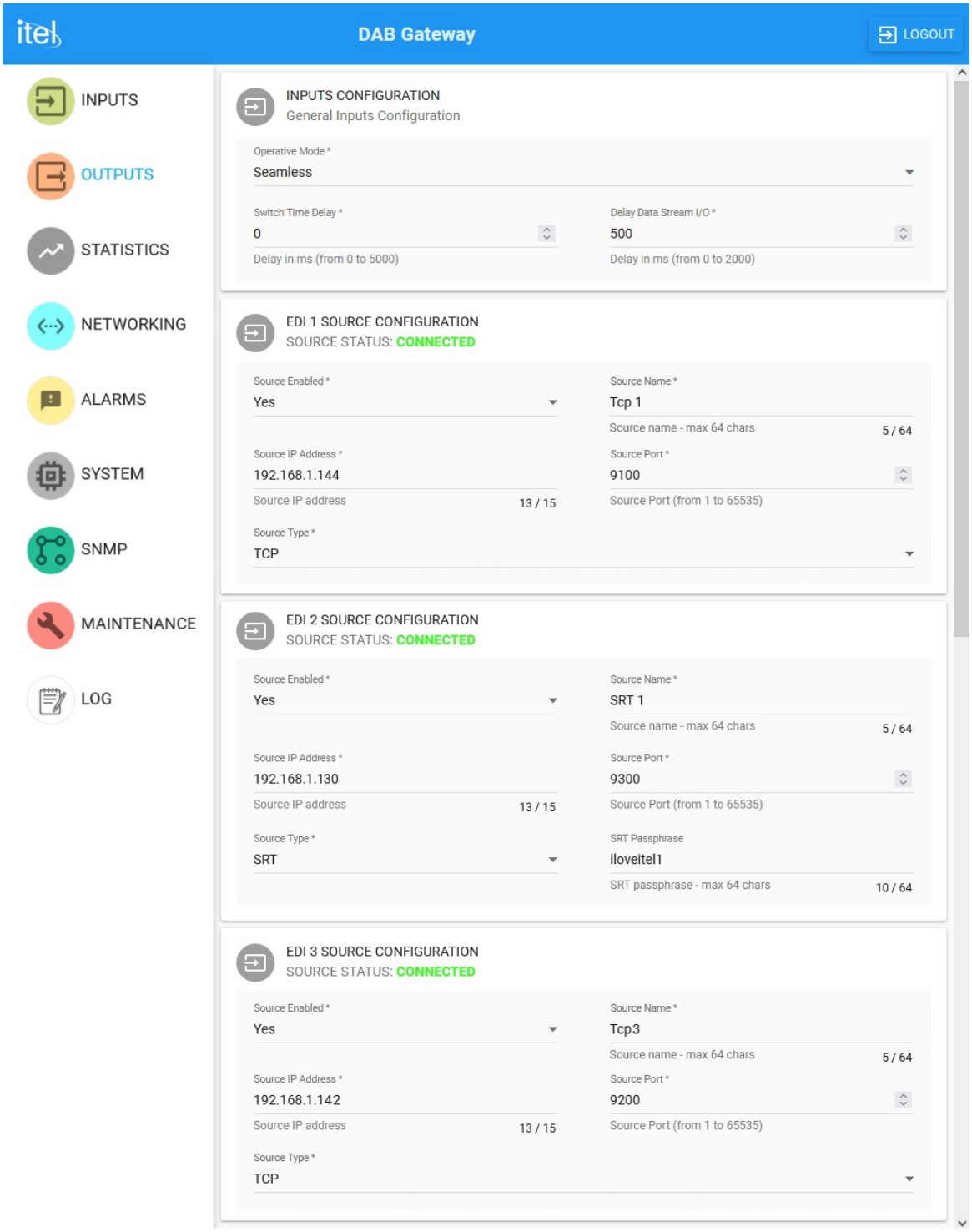
Every time a parameter is modified at the top you will notice the message "Configuration changes detected", clicking APPLY will save as previously set, by clicking cancel it is possible to cancel the modification.

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



2.4 Inputs

In this menu it is possible to configure the addresses and ports from where to take the EDI data in TCP and SRT format coming from the Multiplexer. These protocols make it possible to transport the EDI data in a robust manner on public networks.



The Input Configuration submenu allows you to choose the operating mode between switched and seamless and two other parameters related to the buffer and the switching time.

Operative Mode: Switched/Seamless In switched mode the available inputs will be used by switching between one and the other following the condition of lack of data from the previous input. In this mode it is possible to connect different multiplexers to the three inputs thus creating a backup

switching system. In seamless mode instead it is possible to guarantee the continuity of the output EDI under the condition that at least one of the three inputs contains the complete frame lost in the other connections, this mode follows the SMPTE 2022-7 standard in which the passage from one source to another does not impact the continuity of the output. In this operating mode it is necessary that the three inputs contain the EDI data originated by the same multiplexer.

Switch Time Delay: This parameter is used by the gateway exclusively in Switched operating mode and defines the waiting time before the changeover action between one input to another, the value is expressed in milliseconds with a range of 0 - 5000 ms.

Delay Data Stream I/O: This represents the amount of time the EDI data is delayed before being reissued in UDP format. This value therefore represents the maximum depth of the gateway's local buffer. The value is expressed in milliseconds with a range of 0 - 2000 ms. This delay is applied identically to all three EDI sources.

Three EDI source configuration menus follow with these parameters:

Source Enabled: yes/no choice, it allows to activate or not the reception of the EDI stream from the address and port specified below.

Source Name: This parameter has no effect on the EDI stream it simply a label as a memo to the user.

Source Ip Address: This is the network address from which we will take the Multiplexer's EDI flow.

Source Port: This is the port we will use to receive the stream.

Source Type: Allows you to choose the reception protocol between TCP and SRT, this one works on a bidirectional udp protocol. If you have chosen the SRT protocol, you can specify the data encryption password.

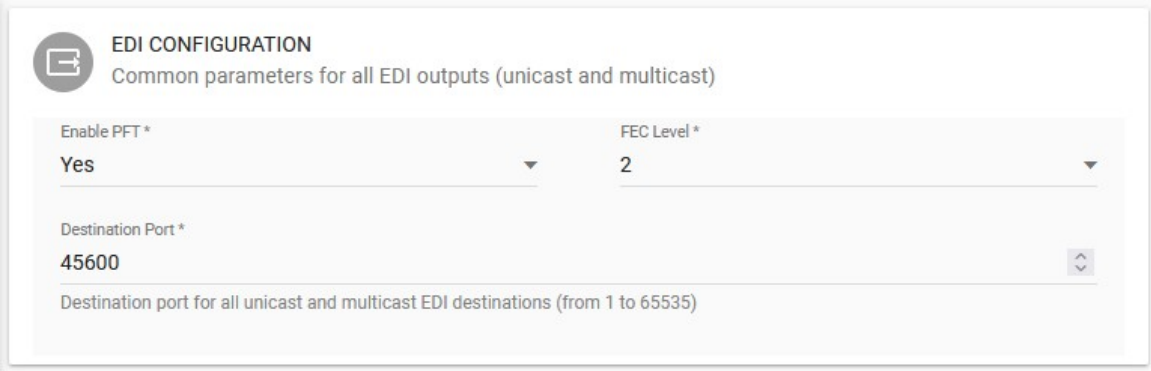
SRT Passphrase: SRT data encryption password, if the field is left blank it corresponds to a non-encrypted flow, if the password is entered it must have at least 10 characters and a maximum of 64.

Important note regarding the SRT flow: when using the SRT protocol, it is normal for the displayed buffer to have a maximum value lower than the Tcp protocol, this is due to the additional buffer that SRT uses to manage the retransmission of lost packets.

The **source status** indication shows the current connection condition, the buffer during normal operation is green, in case of disconnection the buffer turns red.

2.5 Outputs

The **OUTPUTS** section allows you to select all the parameters necessary to configure the EDI data output with which we will feed the transmitters.
The EDI flow is generated in unicast and multicast mode, it is encapsulated in a UDP protocol and is therefore free from retransmission of any packets that may be lost during transport; for this reason it is recommended to connect the gateway to the transmitters via reliable wired or wireless LAN networks free from data congestion that can slow down the flow of UDP packets or even lose them.

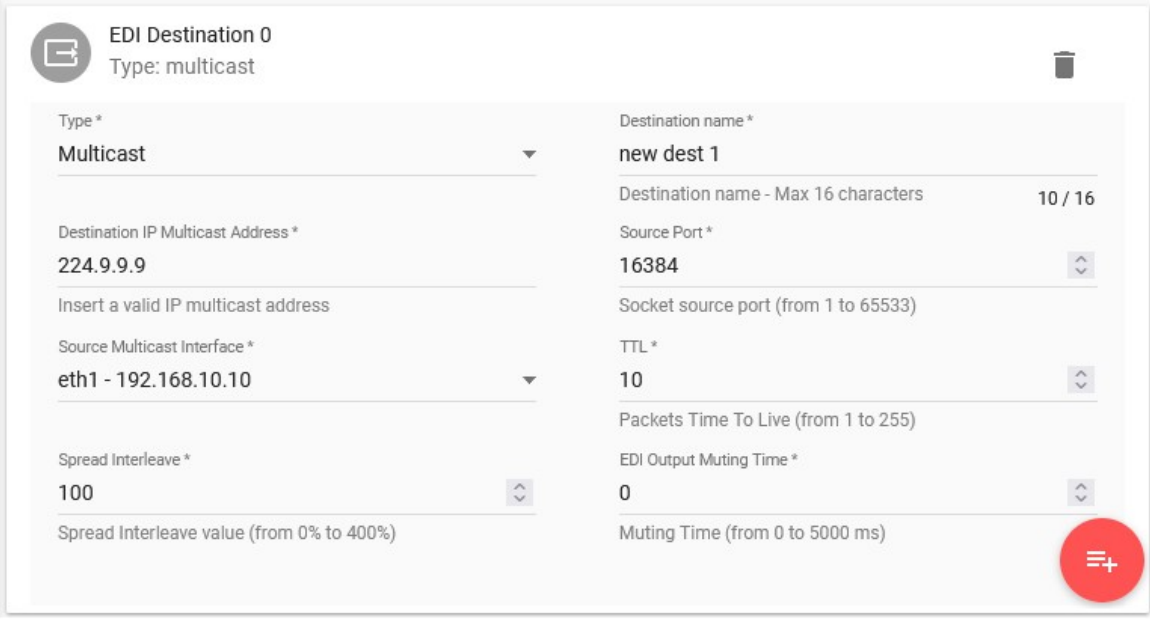


EDI CONFIGURATION: the following parameters in this menu are common to all outputs.

Enable PFT: enables or disables the fragmentation of EDI packets, necessary for better data transport on LAN networks and more efficient error correction.

FEC level: it is the level of error correction using the Reed Solomon algorithm which is added to the EDI data, a value of 0 indicates that the correction is disabled, a value of 5 corresponds to the maximum correction applied, increasing the value increases by consequently also the bandwidth occupied by the EDI data.

Destination Port: it is the destination port of all EDI packets both unicast and multicast generated by the gateway, this parameter together with the multicast address must also be set in the transmitters to which the gateway is connected in order to receive the flow.



EDI DESTINATION:

By clicking on the "+" button at the bottom right it is possible to add a unicast or multicast EDI output, the difference between the two is that the first is sent to a single recipient, while the second allows you to feed several transmitters with the same data without having to generate a data stream for each connected device.
Once created, the destinations will automatically be numbered from 0 to n.
The EDI multicast has the property of propagating through the network to which the gateway is connected, reaching all the ethernet ports which, for example, share the switch.

Type: can be unicast or multicast as previously explained.

Destination name: is the name of the destination, this parameter has no effect on the EDI flow but it is simply a label as a memo for the user.

Destination IP Address: this is the address to which the EDI packets will be sent. If a multicast output has previously been selected, this address must be class D, ie between 224.0.0.0 and 239.255.255.255.

Source port: it is the number of the port from which the EDI packets will be sent, this parameter in particular does not influence the reception of the flow by the transmitter, therefore it can be left at the suggested default value, or changed for routing needs.

If a multicast stream has been chosen, as shown in the photo above, these additional two parameters will also be present;

Source IP Address: it is the address of the network card from which you want to send the multicast packets, it is recommended to use the gateway's ethernet 1 interface to issue the multicast flow.

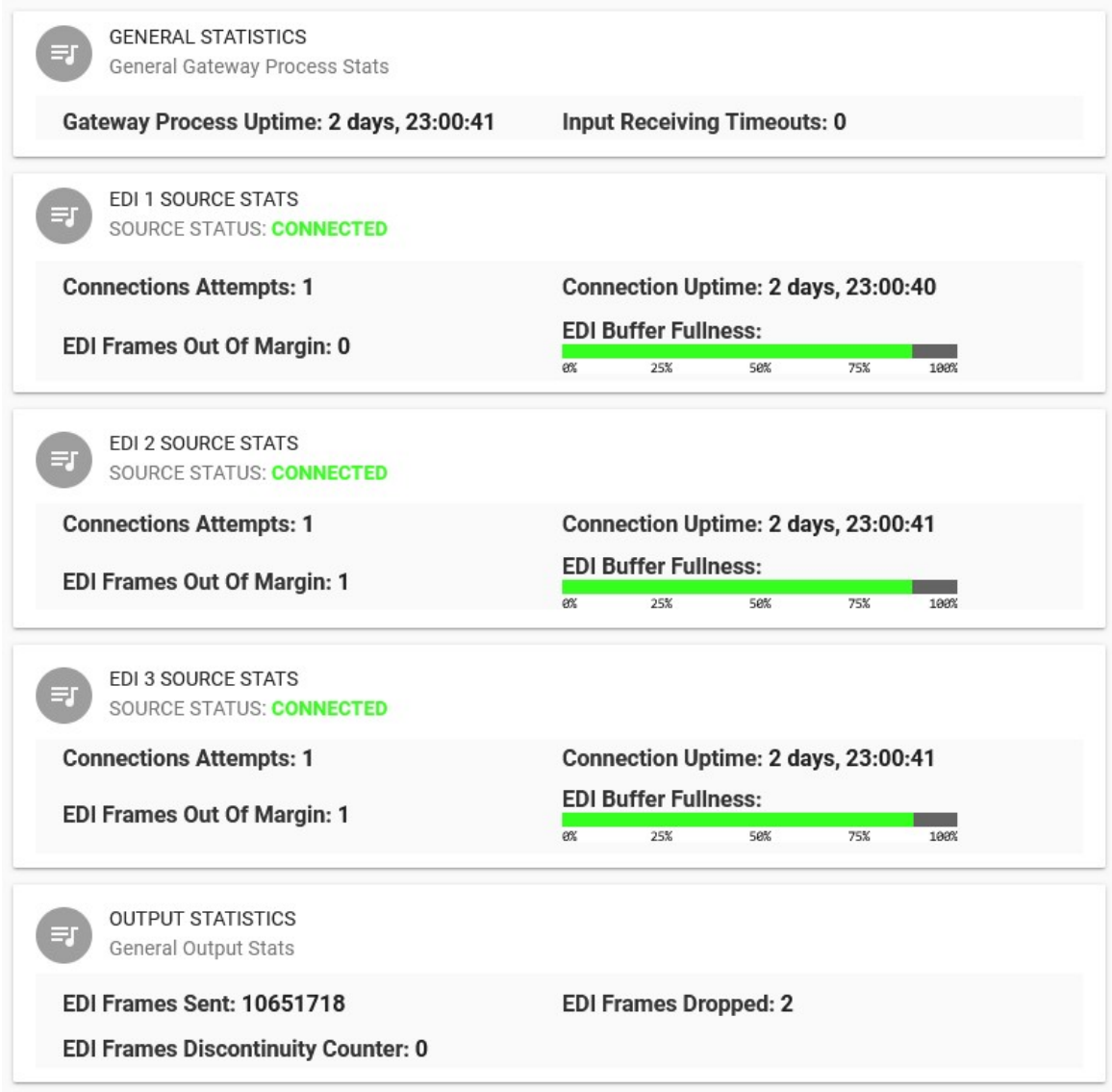
TTL: Time to live or the duration of life of the udp packet default value 1, this value can be increased if it is necessary to cross more routers.

Spread Interleave: represents the distribution value of the packets in the 24ms of frame duration as a percentage, values lower than 100% indicate that we are emitting all the packets of that frame in less than 24ms, values higher than 100% indicate that we are emitting the data of the previous frame during the transmission of the next, this allows to operate an interleaving which helps to improve the system performance in case of loss of sequential packets.

EDI Output Muting Time: It is the time in which the EDI output remains without flow following the lack of a frame, setting the value to 0 the flow will be present again as soon as the data will be available in the input buffers.

2.6 Statistics

The STATISTICS section offers the user a series of parameters relating to the functioning of the gateway which allow to quickly evaluate the quality of the data received and the continuity of the EDI Udp flow generated.



GENERAL STATISTICS:

Gateway Process Uptime: the value represents the elapsed time since the gateway service started.

Input Receiving Timeouts: indicates the number of times the receiving process has stopped due to lack of data from all sources, each increment of 1 represents a timeout of the duration of 24ms.

The parameters relating to the statistics of the three sources follow:

Connection attempts: represents the number of times the receiving process related to the source has reconnected to the multiplexer.

Connection uptime: the value represents the time elapsed since the last connection established with the multiplexer**.**

EDI frames out of margin: indicates the number of frames received containing a timestamp older than the minimum expected to load the input buffer.

EDI Buffer Fullness: the green bar indicates the fullness of the input buffer, the length of this is determined, as explained in the input section, by the set delay value, therefore the 100% full scale value corresponds to the set delay value in milliseconds. During the normal operation of the Gateway it is possible to notice a fluctuation of the fullness value, this is due to the network jitter introduced in the transport, an excessive emptying of the buffer shows the presence of connectivity problems, when the value drops below 50% the bar from green become red to attract the user's attention.

OUTPUT STATISTICS:

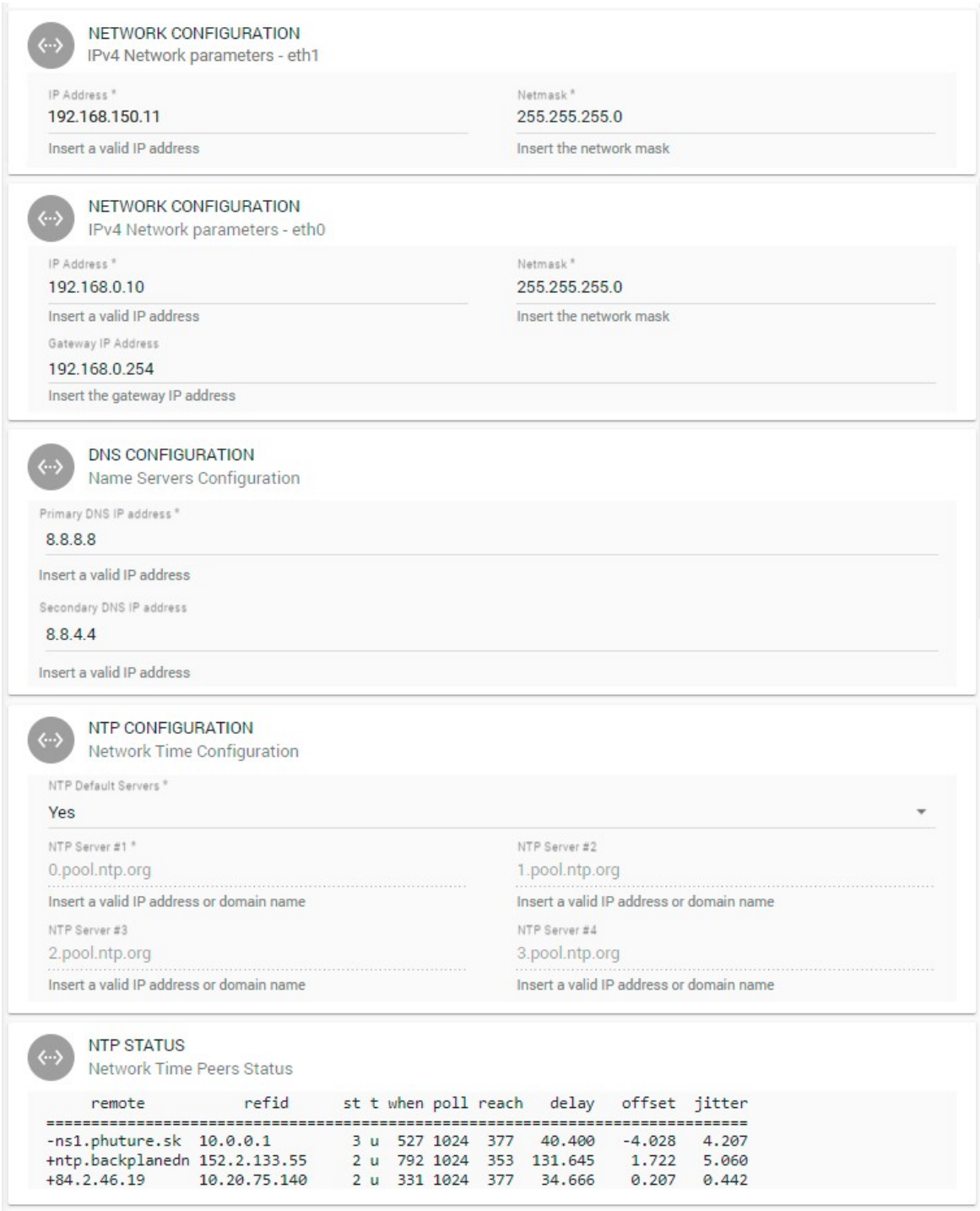
EDI Frames Sent: represents the number of EDI frames that the gateway has output since it was started.

EDI Frames Dropped: indicates the number of frames that have been discarded by the three reception sources due to their excessive delay if the gateway is working in seamless mode or the number of frames discarded if the gateway is operating in switch mode during the backoff time. In the case of seamless operating mode, this value also increases if frames are received in an input that are excessively delayed compared to another input (or containing errors), so the increase in this value is not significant if there were interruptions in the output.

EDI Frames Discontinuity Counter: indicates the number of times in which a discontinuity occurred in the sequence of frames produced in output due to a lack of data.

2.7 Networking

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



NETWORK CONFIGURATION

IP Address eth1: IP address of second ethernet interface

Netmask eth1: Netmask of second ethernet interface

The gateway is not available for the eth1 network interface, it is reserved for the local management of the gateway via web interface on port 80 and for the reception of AES67 - Livewire streams.
The eth0 interface is reserved for sending coded streams to multiplexers and for remote management of the gateway via web interface on port 80.

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.

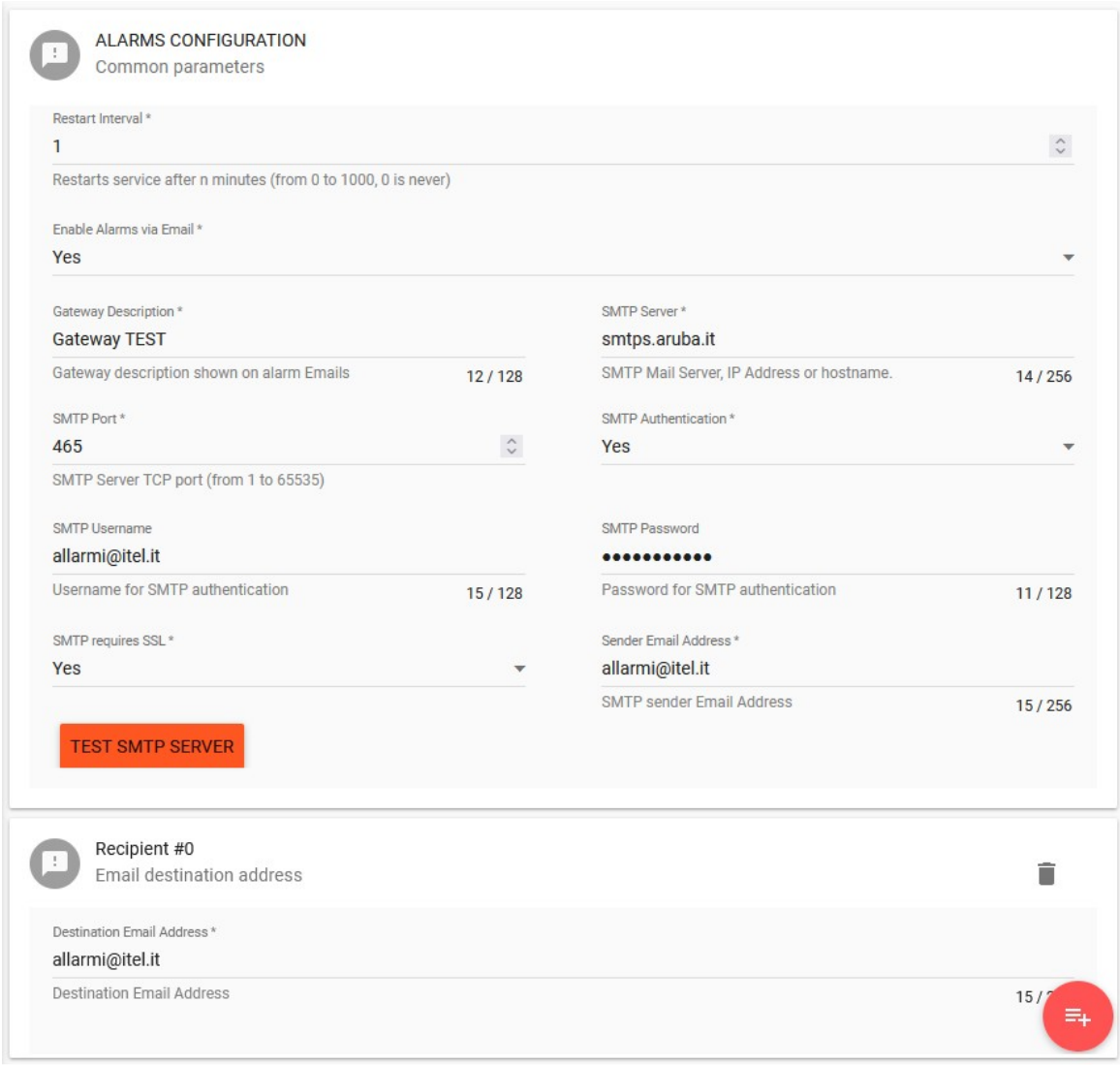
NTP CONFIGURATION

This menu offer you the possibility to specify the addresses of the NTP servers necessary to the gateway 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 gateway, 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 gateway startup, is necessary verify the network configuration and in particular the access to internet to the port 123 in udp protocol.

2.8 Alarms

In this menu it is possible to set the parameters necessary for sending alarm emails and the restart times of the gateway in case of block.



In the event of blocking of the transcoding process, an alarm email is sent to the enabled recipients, upon resetting, a second email is sent confirming the correct functioning of the gateway.
During normal operation of the gateway, alarm emails are sent in the following cases:
- if one of the sources disconnects and reconnects.
- if the output goes muted and becomes operational again, this happens, in seamless mode, if all the flows are missing and if, in the case of switched mode, we have set a mute value > 0 (switch time delay).
- if the value of the EDI frame discontinuity parameter increases.

- if the fan rotation speed value goes to 0.
- if the CPU temperature value exceeds 65 degrees.

Enable Alarms via Email: Enable the email

Restart interval: indicates after how many minutes the supervision system restarts the process that has gone in block, if the value 0 is set, the supervision system will not restart any process blocked, it's important put a value => 1.

Gateway description: is the name of the Gateway that will be shown in the emails.

SMTP Server: is the address of the SMTP server for sending emails

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

SMTP Authentication: enables or disables authentication using a user name and password for the SMTP server

SMTP Username: is the username required for authentication

SMTP Password: is the password required for authentication

SMTP requires SSL: enables or disables the SSL protected connection for the SMTP server

Sender Email Address: is the sender address with which emails will be sent

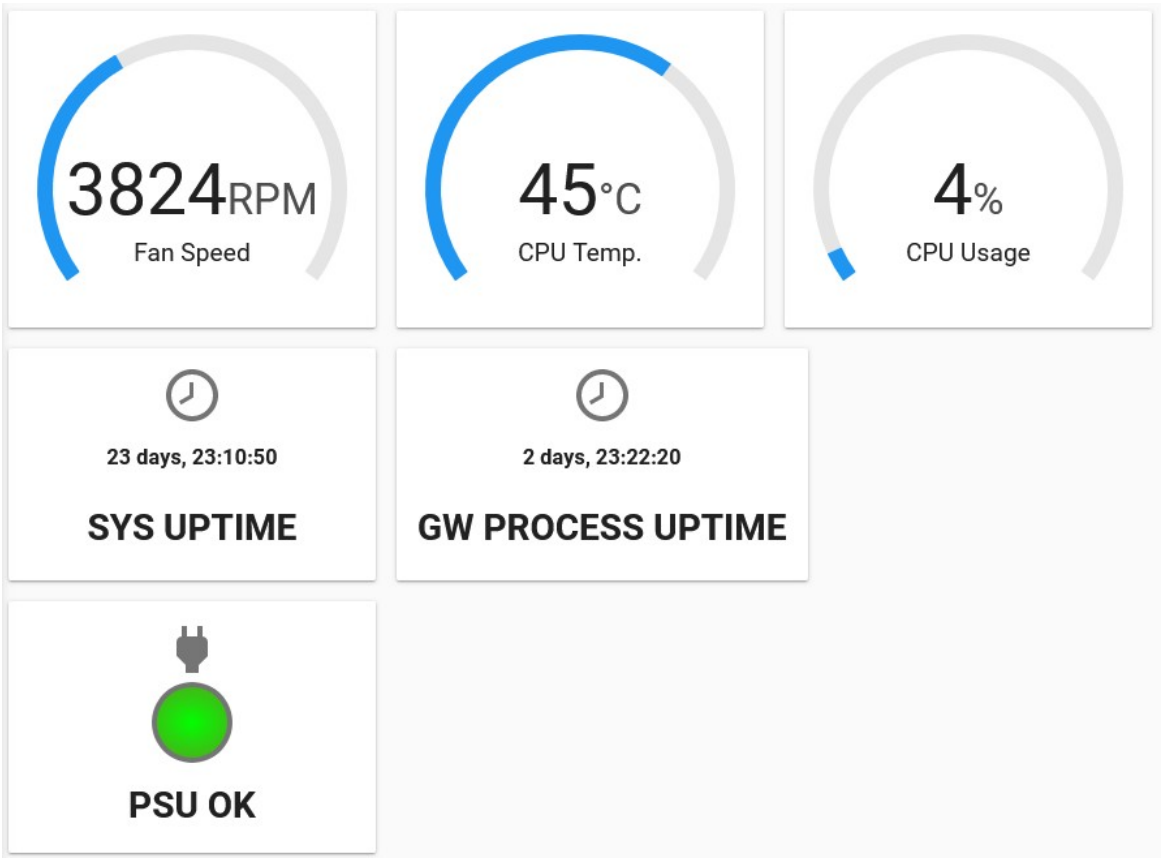
TEST SMTP SERVER: by pressing this button you can send a test email to all configured addresses so as to verify correct operation.

pressing red button with + is possible add new receivers

Destination Email Address: allows you to specify the email address to send alarm messages to.

2.9 System

The most important parameters of the gateway relating to the hardware platform and processes are shown in the system menu



Fan Speed: the value indicates the rotation speed of the fan located on the right side of the gateway, the fan is controlled by the motherboard and if the CPU exceeds 55 degrees the speed is increased until the temperature decreases.

CPU Temp: CPU temperature, when the value of 65 degrees is exceeded, an alarm is generated both via snmp trap and via email, the alarm is also reported in the log menu.

CPU Usage: CPU load expressed as a percentage.

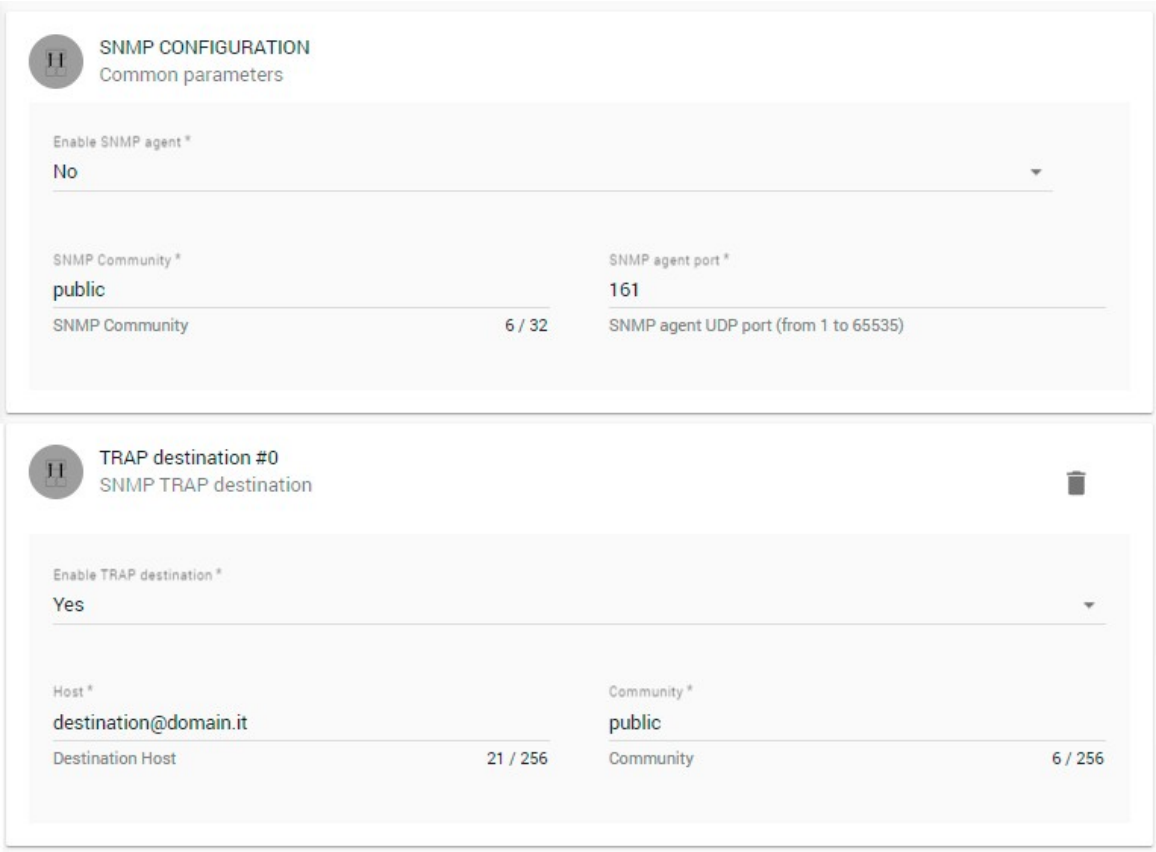
Sys Uptime: Indication of the time elapsed since the gateway was started.

GW Process Uptime: Indication of the time elapsed since the first gateway process was started.

PSU: status of the power supplies, the indication is green and shows PSU OK when both power supplies are working normally, in case of failure of one of these the indication turns red and the indication PSU FAULT is shown, the alarm generates a trap snmp, sending an email and is reported in the log menu.

2.10 Snmp

In this menu is possible to set the snmp (simple network management protocol), this is the most diffused remote control system for professional equipment.



Enable SNMP agent: enable or disable the access to the data of gateway by the snmp, the data request must be made by the external server.

SNMP Community: it is the string that defines a sort of user name used by the control device to query the gateway**.**

SNMP Port: it is the port through which the snmp data flows, normally port 161 is used.
If you want to send data from the gateway in case of alarms to an external server, you will need to click the button at the bottom right with the '+', once this operation has been done, the first trap menu will appear.

Enable TRAP destination: enable or disable the sending of the trap to the subsequently specified address.

Host: is the address of the server in charge of receiving the Traps generated by the gateway.

Community: As previously described, it is a sort of user name with which the gateway will announce itself before sending a trap.

Send Snmp Test Trap: By clicking this button, you can send a test snmp trap to all specified addresses.

By repeatedly clicking the '+' key it will be possible to specify multiple trap recipients.

Traps are sent in the following cases:

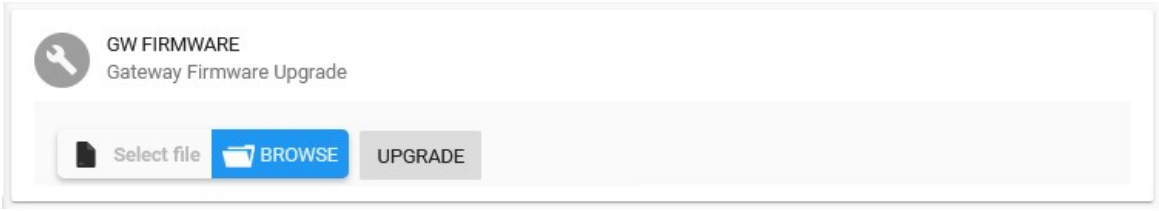
- if one of the sources disconnects and reconnects.
- if the output goes muted and becomes operational again, this happens if all the flows are missing and if, in the case of switched mode, we have set a mute value > 0.
- if the value of the EDI frame discontinuity parameter increases.
- if the fan rotation speed value goes to 0.
- if the CPU temperature value exceeds 65 degrees.

2.11 Maintenance

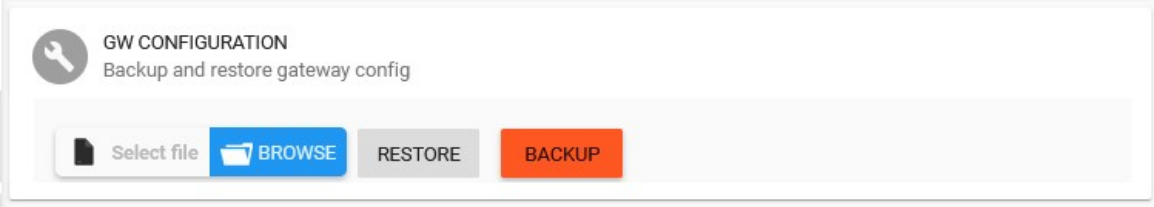
The following functions are available in the maintenance menu:

Time zone: Choose the right Time Zone

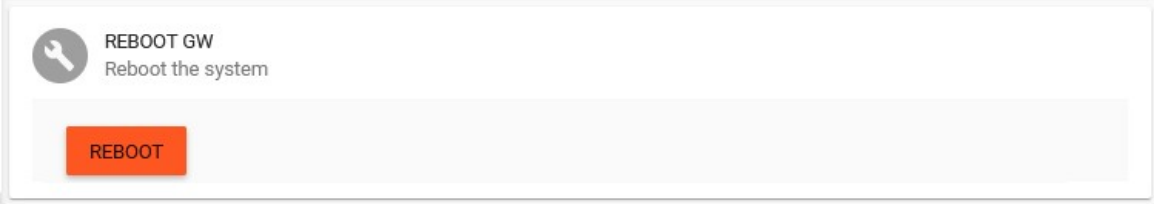
Gateway Firmware: allows you to update the system firmware, clicking browse opens a window where you can search for the file containing the new firmware, once selected must be clicked update and waiting for the system to restart.



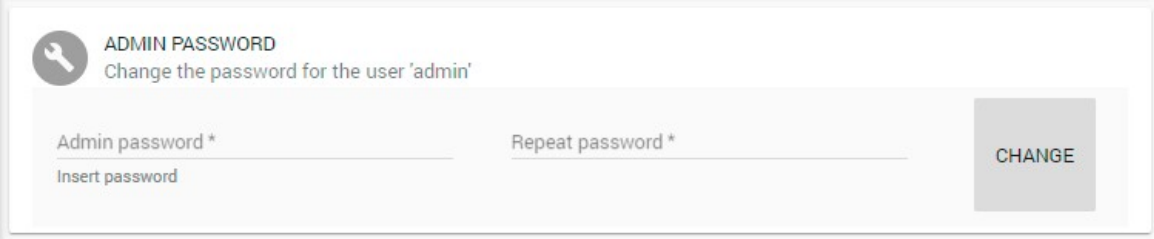
Gateway configuration: allows you to save the configuration of the gateway in a file by clicking the Backup button and to load a configuration file using the Restore button; in the case of saving and restoring the parameters, everything except the network configuration addresses will be saved.



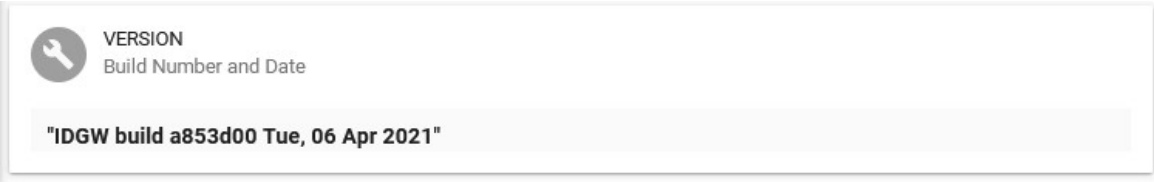
Reboot: allows you to restart the machine.



Admin password: allows you to change the system administrator password, type the new password 2 time and then click change..

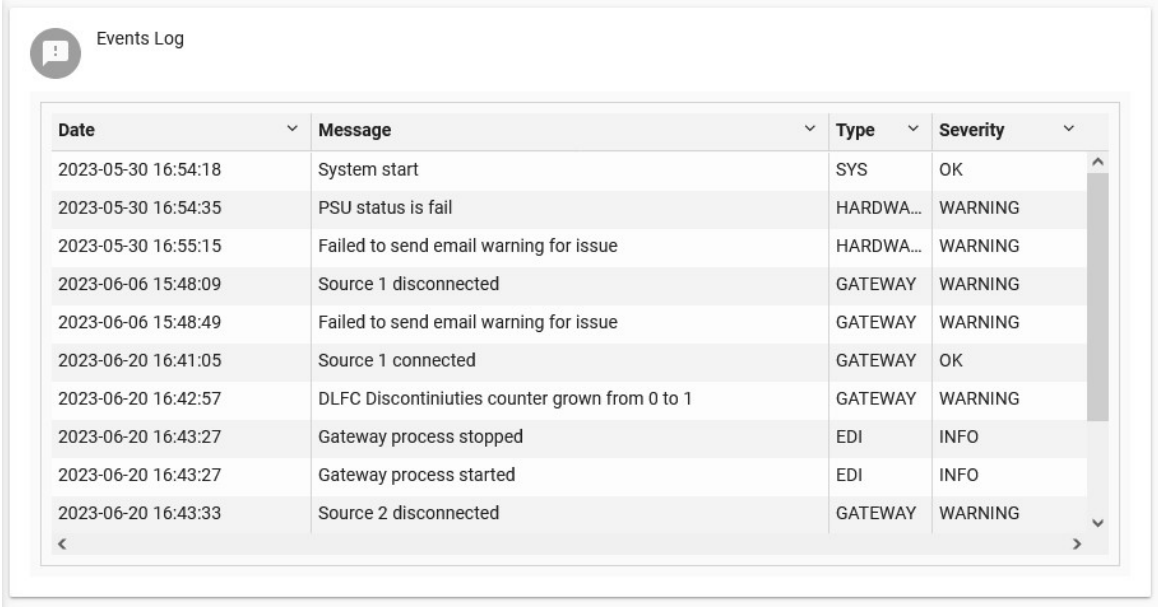


Version: is the build release actually present in the gateway and the date of creation.



2.12 Log

This section contains the list of alarms



This page stores the events relating to alarms or malfunctions, these are maintained until the machine is switched off.
If clicked, the arrows next to the labels at the top allow you to sort the relative alarms according to ascending and descending criteria,
The Type column highlights the type of alarm which can be: **SYS** or system, **HARDWARE** therefore relating to some solid component of the gateway, **GATEWAY** therefore relating to some gateway flow reception problem, EDI relating to gateway processes.

Section 3

Recovery

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 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.

3.1 Menu and factory reset

At the pin request enter the default value 1234 and press enter, then a window will be presented with the following options available, to choose one, simply select it with the arrows and then press enter:

Platform information: provides the data of the system license.
Services status: shows the status of the services that are running, ie the enabled gateway.
Networking setup: allows you to change the IP addresses of the two ethernet interfaces and the DNS, it is recommended not to put addresses of similar class in the two ethernet interfaces and never to configure a gateway in the eth1 interface.
Issues escalation setup: allows you to set the parameters for sending an alarm mail
Admin password set: allows you to change the administrator password.
Change PIN: allows you to change the PIN code to access the recovery interface (in case of loss of this code it will no longer be possible to access the recovery interface).
Factory reset: reset the system to the default parameters.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