LEMCO®

PRO Line Headend Series

PLC-200/201/202/ 300/301/302

Operation Manual

www.lemco.gr

v1.0

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1. IMPORTANT SAFETY PRECAUTIONS INFORMATION

READ AND UNDERSTAND THE FOLLOWING WARNINGS BEFORE USING YOUR DEVICE TO ENSURE SAFE AND PROPER USAGE

WARNING

To prevent fire, electric shock, or other hazards, always observe the following safety precautions. These precautions include, but are not limited to:

Power supply / Mains cord
• Use the unit strictly within the voltage range specified by the manufacturer to prevent damage or malfunction.
• Regularly inspect the power connector and remove any accumulated dirt or dust to maintain optimal performance.
• Use only the mains cord provided with your unit to ensure compatibility and safety.
• Avoid using the unit or plugging in the mains cord if it appears damaged, frayed, or compromised in any way.
• Keep the mains cord away from heat sources and avoid pulling, placing heavy objects on, or causing damage to the cord. Store it safely out of children's reach.
• Plug the device into a properly grounded socket to minimize the risk of electrocution.
• When disconnecting plugs, always pull on the plug and not the cord. Ensure the unit's power switch is off before removing the cord from an outlet.
• Unplug the mains cord during extended periods of non-use or during storms to protect the unit.
• Avoid connecting the unit to a multi-outlet to prevent plug overheating and potential fire hazards.

Disassembling
• This unit contains specialized components that are not user serviceable. Refrain from disassembling or attempting repairs, as this will void any warranties. Contact the manufacturer for assistance with any issues.

Water/humidity
•Store and operate the unit in a dry environment, away from moisture or water sources.
• Never plug or unplug the unit with wet hands to avoid electric shock.

Fire
• Avoid placing open flames, such as candles, on or near the unit to prevent potential fires.
• In case of damaged mains cords, power connectors, sudden loss of functionality, unusual smells, or smoke, promptly turn off the unit, disconnect the mains cord, and contact the manufacturer's technical support department.

Installation / Storage
• To ensure optimal performance and prevent damage, store the unit in a clean, dry location, away from temperature extremes (e.g., direct sunlight, heaters, or inside a car during the day). Securely place the unit to prevent falls.
• Before moving the unit, disconnect all cords.
• When installing the unit, ensure that an outlet is easily accessible for quick disconnection in case of malfunction. Disconnect the mains cord when the unit is not in use for extended periods.

Connectivity
• Always turn off and unplug all devices before connecting the unit to other electronic devices.

Maintenance
• Avoid spilling liquids on the unit. To clean, use a soft, slightly damp cloth and allow the unit to dry completely before using it again. Do not use harsh chemicals or volatile liquids.

Handling
• Do not insert fingers or objects into the unit's openings.
• Never insert paper, metal, or other foreign objects into the unit's openings. If foreign objects are suspected inside the unit, turn it off, unplug the mains cord, and contact the manufacturer's technical support department.
• Refrain from stepping on or placing heavy objects on the unit. Gently handle all buttons, connectors, and switches to avoid

hardware damage.

Electromagnetic Interference (EMI) and Radio Frequency Interference (RFI) precautions
• Be aware that your device may cause or be affected by electromagnetic interference or radio frequency interference. Keep the device at a safe distance from other electronic devices, such as pacemakers, hearing aids, or other medical equipment, to prevent potential interference.
• Avoid placing the device near or on top of audio equipment or televisions, as it may cause interference with the reception or operation of these devices.

Accessory compatibility
• Use only compatible accessories and attachments approved by the manufacturer. Using unauthorized or incompatible accessories may cause malfunction, damage to the unit, or pose safety risks.

Software updates
• Regularly check for software updates and install them to ensure your device stays up to date with the latest security patches and bug fixes. This will help maintain the device's performance, stability, and overall user experience.

Child safety
• Keep the device and all its accessories out of the reach of children. Small parts may pose a choking hazard. Additionally, improper use of the device by children could result in damage or injury.

Environment and disposal
• Recycle or dispose of the device, its accessories, and batteries according to local regulations. Electronic devices and batteries should not be disposed of in regular household waste to prevent environmental harm.

Emergency situations
• Be aware that in certain emergency situations, such as earthquakes, fires, or power outages, the device may not function as expected. Always have alternative communication methods and emergency plans in place.

Grounding Precaution

Proper grounding is crucial for the safe and effective operation of your device. To minimize the risk of electric shock, equipment damage, or interference, please follow these grounding precautions:

• Ensure the device is connected to a grounded electrical outlet: The device should be connected to a properly grounded, three-pronged electrical outlet. This will help to protect the device and users from potential electrical hazards.

• Check the grounding of your entire system: All interconnected devices, such as antennas, cables, and other equipment, should also be properly grounded. This helps prevent ground loops, which can cause interference and degrade system performance.

• Use grounded cables and connectors: When connecting the device to other devices, use shielded cables and connectors with proper grounding. This ensures that the entire signal path is grounded, reducing the potential for interference, and improving overall system performance.

• Inspect grounding connections periodically: Regularly check all grounding connections for signs of wear, damage, or corrosion. Loose or damaged grounding connections can compromise the safety and performance of your DTV headend system.

• Consult a professional if in doubt: If you are unsure about the grounding of your system or require assistance with grounding-related issues, consult a qualified technician or electrician. Proper grounding is essential for the safe and effective operation of your device and the overall DTV headend system.

By taking these additional safety precautions into consideration, you can further ensure the safe and proper use of your device.

2. INTRO

Congratulations on purchasing a Pro Line headend from PLC-2xx/3xx series. You are now the proud owner of a high-quality, professional DTV and IPTV headend. This powerful and versatile device is designed to provide you with exceptional performance and reliability for all your digital television needs.

3. INSTRUCTIONS

3.1 – DESCRIPTION

The Pro Line Common interface 2xx and 3xx series (PLC-2xx/3xx) are part of the Pro Line headends product line that provides models with Common Interface (CI) with advanced flexibility. These models offer TV distribution signal over RF+IP simultaneously or over IP ONLY for seamless integration with a wide range of applications. This feature-rich series is designed to meet the evolving needs of the broadcasting industry and offer a superior viewing experience to the end-users.

(PLC-2xx series)
The 2xx series headend from Lemco's Pro Line series is an advanced and powerful all-in-one device series, designed to meet diverse broadcasting requirements. It consists of the following part numbers:

PLC-200 is capable of receiving up to 16x independent satellite (DVB-S/S2), terrestrial (DVB-T/T2), or cable (DVB-C) signals, it converts them into 1xGbit IPTV streaming as well as IP reception (extra license is required).

PLC-201 is capable of receiving up to 16x independent satellite (DVB-S/S2/S2X) + multistream signals, it converts them into 1xGbit IPTV streaming as well as IP reception (extra license is required).

PLC-202 is capable of receiving up to 8x independent satellite (DVB-S/S2), terrestrial (DVB-T/T2) or cable (DVB-C) signals, as well as 8x independent satellite (DVB-S/S2/S2X) + multistream signals (16x input in total), it converts them into 1xGbit IPTV streaming as well as IP reception (extra license is required).

PLC-203 is capable of receiving up to 8x independent satellite (DVB-S/S2), terrestrial (DVB-T/T2) or cable (DVB-C) signals, as well as 8x independent satellite (DVB-S/S2/S2X) + multistream signals (16x input in total), it converts them into 1xGbit IPTV streaming as well as IP reception (extra license is required).

(PLC-3xx series)
The 3xx series headend from Lemco's Pro Line series is an advanced and powerful all-in-one device series, designed to meet diverse broadcasting requirements. It consists of the following part numbers:

PLC-300 is capable of receiving up to 16x independent satellite (DVB-S/S2), terrestrial (DVB-T/T2), or cable (DVB-C) signals, it converts them into 16x DVB-T/C RF output channels while simultaneously providing 1xGbit IPTV streaming as well as IP reception (extra license required).

PLC-301 is capable of receiving up to 16x independent satellite (DVB-S/S2/S2X) + multistream signals, it converts them into 16x DVB-T/C RF output channels while simultaneously providing 1xGbit IPTV streaming as well as IP reception (extra license required).

PLC-303 is capable of receiving up to 8x independent satellite (DVB-S/S2), terrestrial (DVB-T/T2) or cable (DVB-C) signals, as well as 8x independent satellite (DVB-S/S2/S2X) + multistream signals (16x input in total) and converts them into 16x DVB-T/C RF output channels while simultaneously providing 1xGbit IPTV streaming as well as IP reception (extra license required).

Featuring 8x Common Interface (CI) in total, both PLC-2xx and PLC-3xx series are able to descramble various TV content using the appropriate CAM (Conditional Access Module). Its innovative "pool" technology allows users to select any program from the 16x RF or IP inputs and assign it to any of the 16x RF+IP outputs, ensuring exceptional flexibility in content distribution.

Powered by a robust CPU (Quad-core @ 1.8GHz / 2GB RAM) and operating on Linux OS, the device guarantees efficient device control and offers a user-friendly, highly responsive interface. Additionally, the device can be managed remotely or locally

via Ethernet. With its compact design (1U rack mount) and impressive features, the PLC-2xx/3xx headend series is an ideal solution for distributing Free-To-Air (FTA) or scrambled TV programs from various sources (satellite, terrestrial, cable or IP) to a CATV installation using DVB-T/C and IP technology.

Furthermore, the PLC-2xx/3xx headend series can host Fleex Embedded which is an IPTV middleware without requiring an external server, allowing users to control Hotel IPTV monitors in an installation as well as IPTV STBs (more information at: www.fleex.gr) This provides a wide range of features, including Live TV, Live Radio, Info channels, CAST, Weather, Alarm, EPG, and more.

Overall, the PLC-2xx/3xx headend series is a sophisticated and versatile device that delivers top-quality TV distribution, making it an excellent choice for cable TV companies, IPTV providers, hotels, hospitals, and other similar installations.

3.2 - FEATURES

- 16 x independent multi-standard inputs DVB-S/S2/T/T2/C (For PLC-200/300)
- 16 x independent multi-standard inputs DVB-S/S2/S2X (For PLC-201/301)
- 8x independent multi-standard inputs DVB-S/S2/T/T2/C + 8x independent multi-standard inputs DVB-S/S2/S2X (For PLC-202/302)
- 8x Common Interfaces
- 16 x RF output DVB-T/C (software selectable)
- MER value > 45dB
- IPTV streaming (up to 128x SPTS) @ 800Mpbs
- IPTV reception (up to 112x SPTS) @ 800Mpbs
- SAP/SDP support
- "Pool" technology
- PID Filtering
- Custom NIT/SDT support
- PCR re-stamping, Correction
- EPG over RF and IP
- 1U rack mount device
- 2x (HOT pluggable) power supplies working in redundancy mode
- Fleex Embedded support (IPTV middleware)
- 5-year warranty

3.2.1 - Auto-reset functions and watchdog

During the normal operation of the PLC-2xx/3xx headend series, the main CPU monitors all the internal parts in order to ensure that the device works normally. In case of an internal error or module failure, the device immediately initiates the recovery procedure by resetting the appropriate module or the device. Finally, watchdog timers ensure that the device will be reset in case of CPU failure.

3.2.2 - Multi-Standard inputs

Discover the exceptional versatility of the Pro Line headend series as a Multi-standard headend solution. This advanced system is specifically designed to accommodate diverse broadcasting needs and industry standards, including DVB-S/S2/S2X+multistream, DVB-T/T2, DVB-C, HDMI as well as IPTV (IN/OUT). Its seamless integration of various signal formats makes it the ideal choice for cable TV companies, IPTV providers, hotels, hospitals, and other installations that require a flexible and efficient headend solution.

3.2.3 - "Pool" technology

One of the most state-of-the-art TS multiplexer is responsible of providing the "pool" technology feature as well as to offer a variety of different features such as custom NIT/SDT creation, EPG over RF and IP, LCN and more…

3.2.4 - RF and IPTV distribution simultaneously

Experience the best of both worlds with the PLC-2xx/3xx headend series solution, which offers simultaneous RF and IPTV distribution without any extra license. This cutting-edge system enables you to distribute content through both traditional coaxial infrastructure (RF) and modern internet protocol television (IPTV) networks, providing unparalleled flexibility and efficiency in content delivery.

3.2.5 – Dual Power supplies

The Pro Line headend series features dual power supplies operating in redundancy mode, ensuring uninterrupted performance. In case of a failure in the primary power supply, the system automatically switches to the backup, maintaining continuous operation. Both power supplies are hot-pluggable, allowing for easy replacement or maintenance without shutting down the system, further enhancing reliability and minimizing downtime.

3.2.7 – 1U Rack mount

The Pro Line headend series is designed as a compact 1U rack-mountable device, offering a space-efficient solution for installation in standard server racks. This form factor allows for easy integration into existing setups while maximizing rack space. The 1U design ensures optimal airflow and cooling, while maintaining a sleek and organized equipment configuration, perfect for professional environments where space and efficiency are key

3.2.7 – Cold Reset

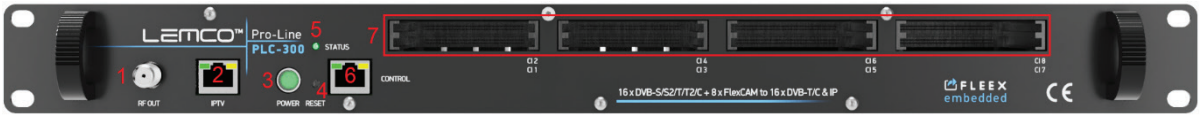
The Pro Line headend series includes a convenient Cold Reset feature, allowing users to remotely initiate a full reset of the device via LAN. When triggered, the device powers off completely for 10 seconds before automatically powering back on. This function helps in resolving system issues or applying critical resets without the need for physical access, making remote management and troubleshooting more efficient and user-friendly

3.2.8 - Fleex Embedded support

Enhanced guest experience with Fleex Embedded IPTV middleware enabling control of TVs from major brands such as LG, Samsung, and Philips, and offering basic middleware functionality directly from the headend without the need for external server.

3.3 – Product views

3.3.1 – Front panel view



1. RF output (Only for PLC-3xx series)
2. IP LAN & Fleex Embedded control port
3. Power ON/OFF button
4. Reset button
5. Status indicator
6. IP IN/OUT port
7. Common Interfaces (CI)

3.3.2 – Back panel view

PLC-200/300

1. Dual power supplies
2. DVB-S/S2 RF input
3. DVB-T/T2/C RF input

PLC-201/301

1. Dual power supplies
2. DVB-S/S2/S2X RF input
3. SAT RF LOOP-THROUGH

PLC-202/302

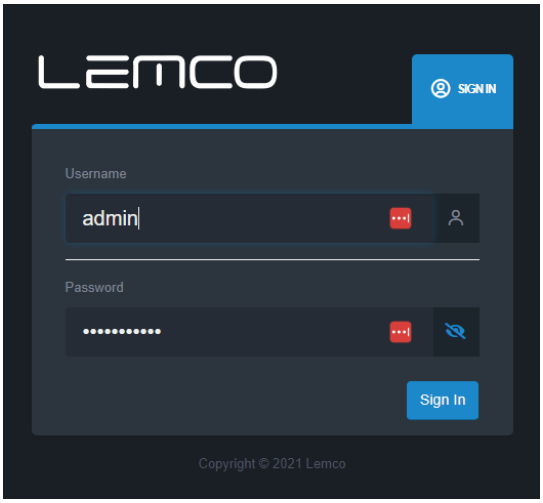
1. Dual power supplies
2. DVB-S/S2/S2X RF input (No9…No16)
3. SAT RF LOOP-THROUGH (No9…No16)
4. DVB-S/S2 RF input (No1…No8)
5. DVB-T/T2/C RF input (No1…No8)

4. INSTALLATION

4.1 - General

The PLC-2xx/3xx headend series offers a highly user-friendly interface for programming and monitoring purposes. To access the intuitive graphical user interface, simply open an internet browser, such as Internet Explorer, Firefox, or Chrome, and enter the following static IP address: 192.168.1.200. This easy-to-use interface provides an efficient way to manage and monitor your headend system, ensuring optimal performance and seamless content delivery.

Once connected to the PRO Line headend device, you will be prompted to log in, as shown in the provided image:



The default username and password for the device are as follows:

Username: **admin**
Password: **12345**

Enter the default credentials to access the system's user interface, where you can manage and monitor your headend solution with ease.

4.2 – Graphical User Interface (GUI)

Status

4.2.1 - "Dashboard" page

Every time you connect to a PLC-2xx/3xx headend device, the "Dashboard" page is automatically loaded, providing a comprehensive overview of the device's current status. This dashboard presents essential information about the system's performance and operation, allowing you to monitor and manage your headend solution effectively.

In the Dashboard, users can easily monitor essential aspects of the device's operation, ensuring smooth performance and quick identification of any issues. The information displayed on the Dashboard includes:

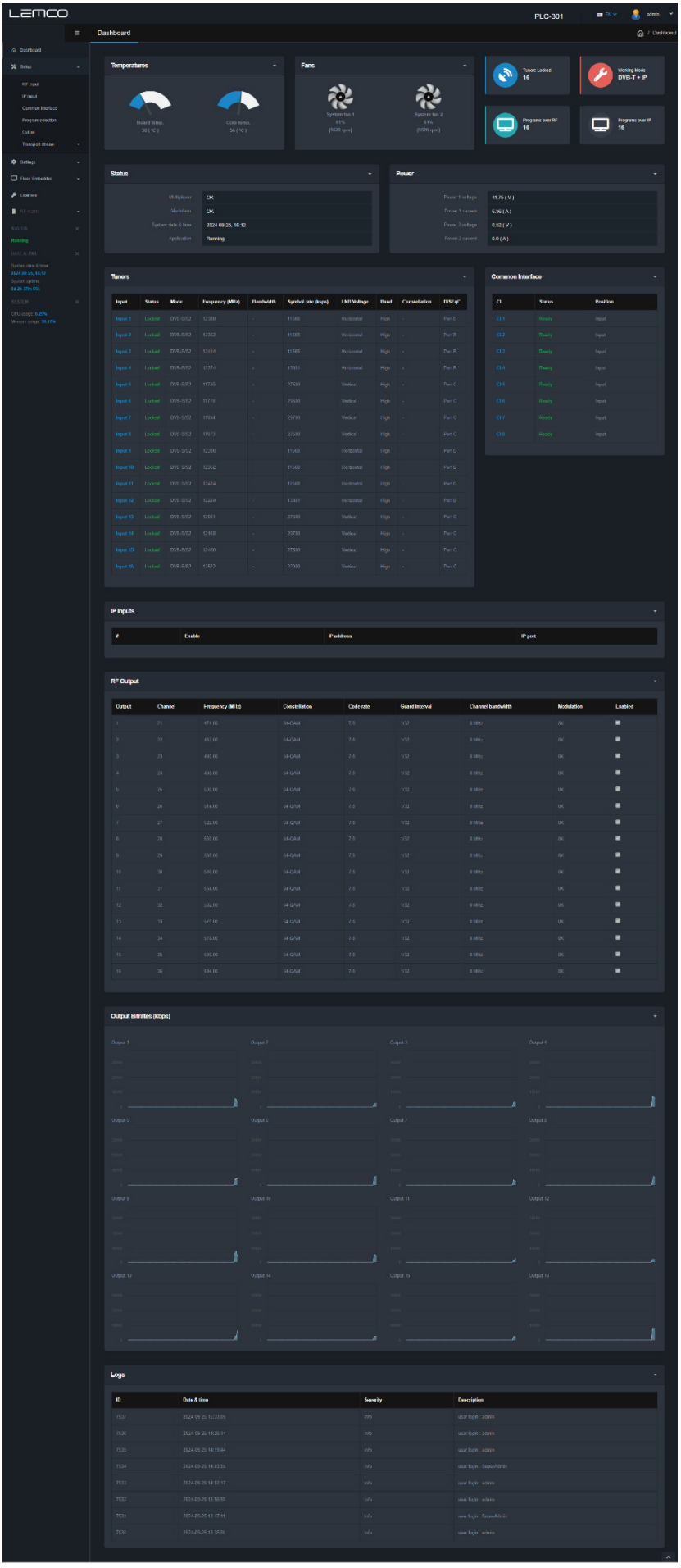
Temperatures
Keep track of the device's board and CPU temperature to ensure proper cooling and temperature monitoring.

Fans
Monitor the performance of the two cooling fans to maintain optimal operating conditions as well as displaying their current RPM. The PLC-2xx/3xx headend device use a sophisticated smart cooling system in which the RPM of the fans increases/decreases based on the internal board and CPU temperature. In case of fan failure, several alarms will take place to inform the user.

Status
1. Multiplexer and Modulator engine status: Check the working status of the device's core components for seamless content processing and distribution.

2. System date and time: Verify the accuracy of the device's internal clock for proper scheduling and event handling.

3. Application: Monitor the overall health and functionality of the device's primary software such multiplexers, modulators condition etc…


LEMCO
PLC-301
admin
Dashboard
Temperatures
Fans
Tuners Locked
16
Working Mode
DVB-T + IP
Programs over RF
16
Programs over IP
16
Status
Power
Tuners
Common Interface
IP Inputs
RF Output
Output Bitrates (kbps)
Logs

Power
Monitor the voltage and current of both power supplies of the PLC-2xx/3xx headend device.

Infographics
Additionally, the Dashboard features four infographics that provide insights into:

1. Tuner lock status: Display the number of tuners currently locked onto a frequency for stable signal reception.

2. Device working mode: Show the operational mode of the device, indicating how it processes and distributes content.

3. Number of TV programs distributed over RF: Display the count of TV programs being transmitted via RF (Radio Frequency) channels.

4. Number of TV programs distributed over IP: Show the count of TV programs being streamed via IP (Internet Protocol) networks.

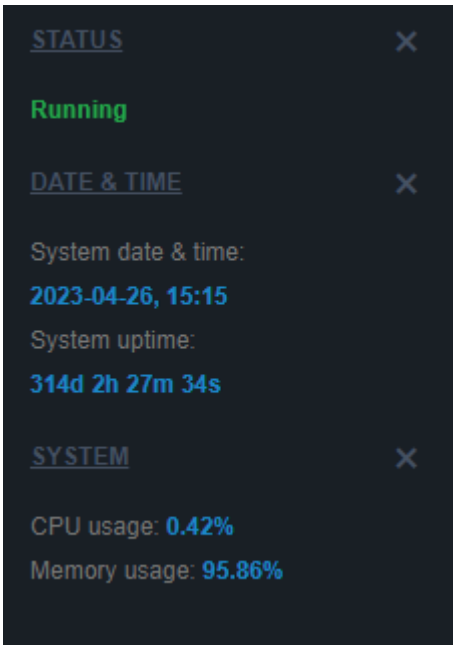
Tuners:
In this section, users can monitor the working status of all the RF inputs of the device. This includes information on whether they are locked or unlocked, their working mode, and their current settings.

Common Interface:
In this section, users can monitor the status of all the Common Interfaces of the device. This includes information if there is any CAM or not on any CI slot as well as their positions.

RF Output:
This section allows users to view the working status of all the RF outputs of the device, such as the modulator's state, RF output frequencies, and modulation settings.

Output Bitrates:
The device displays the output bitrates of all multiplexers in a chart format, enabling users to quickly assess the data transmission rates for each output.

Logs:
The Logs section provides a record of the last ten event logs, giving users a snapshot of recent device activity and assisting in troubleshooting any issues that may arise.



Status Device

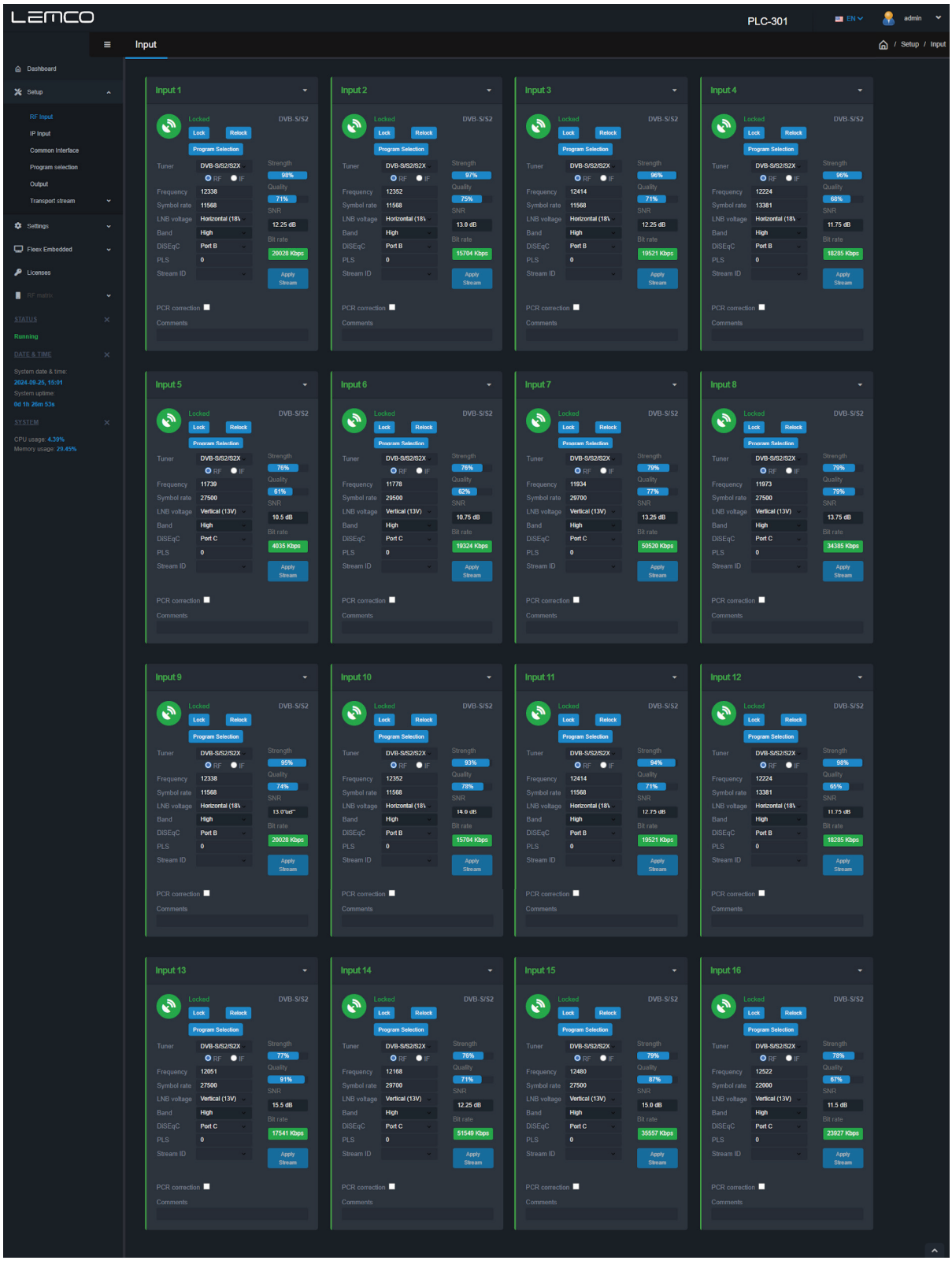
At the bottom of the left menu of the device we've the following information:

- Status of the software application:
  - o Running: The application is running properly
  - o Initializing: The application initializes the headend device
  - o Stopped: The application has stopped working
- System's current date and time
- System's up time
- CPU and Memory usage by %

Setup

4.2.2 – “RF Input” page

In the “RF Input” page, users have the ability to select the working mode for each RF input:



There are sixteen sections, one for each RF input. Users can configure the working mode of each RF input using the following field:

(PLC-200/300/202/302)
Tuner – This field allows users to select the tuner's working mode (DVB-S/S2, DVB-T/T2, DVB-C or Disabled)

For Satellite signal reception the user must select DVB-S/S2 mode from Tuner field and provide the following parameters:

1. RF or IF Radio button – Select frequency input format
2. Frequency – Insert satellite frequency
3. Symbol rate – Insert satellite symbol rate
4. LNB voltage – Select the LNB voltage (13V,18V, OFF)
5. Band – Select the appropriate SAT band (works only if IF frequency is selected as input method)
6. DiSEqC – Select DiSEqC A, B, C, D

For Terrestrial signal reception the user must select DVB-T/T2 mode from tuner field and provide the following parameters:

1. Frequency – Insert the terrestrial input frequency or
2. Channel – Instead of inserting a frequency you can add the channel number
3. Bandwidth – Insert the input channel bandwidth

For DVB-C signal reception the user must select DVB-C mode from tuner field and provide the following parameters:

1. Frequency – Insert the input cable frequency
2. Symbol rate – Insert the symbol rate
3. Constellation – Insert constellation

Once all settings are being written for both tuners, the user must click the "Lock" button to begin the lock process.

(PLC-201/301/202/302)
Tuner – This field allows users to select the tuner's working mode (DVB-S/S2/S2X, Disabled)

For Satellite signal reception the user must select DVB-S/S2/S2X mode from Tuner field and provide the following parameters:

7. RF or IF Radio button – Select frequency input format
8. Frequency – Insert satellite frequency
9. Symbol rate – Insert satellite symbol rate
10. LNB voltage – Select the LNB voltage (13V,18V, OFF)
11. Band – Select the appropriate SAT band (works only if IF frequency is selected as input method)
12. DiSEqC – Select DiSEqC A, B, C, D
13. PLS – Insert PLS value in case of multistream reception
14. Stream ID - Insert stream ID value to select specific stream in case of multistream reception

For Terrestrial signal reception the user must select DVB-T/T2 mode from tuner field and provide the following parameters:

4. Frequency – Insert the terrestrial input frequency or
5. Channel – Instead of inserting a frequency you can add the channel number
6. Bandwidth – Insert the input channel bandwidth

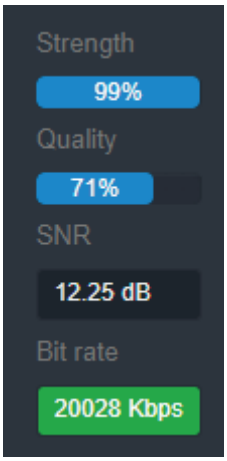
For DVB-C signal reception the user must select DVB-C mode from tuner field and provide the following parameters:

4. Frequency – Insert the input cable frequency
5. Symbol rate – Insert the symbol rate
6. Constellation – Insert constellation

Once all settings are being written for both tuners, the user must click the "Lock" button to begin the lock process.

More options

Relock – It will initialize new lock procedure for tuner without erasing the previous program list.
PCR correction – Enable / Disable to perform PCR correction of the input stream.
Comments – Text box to add any comments for this specific input.



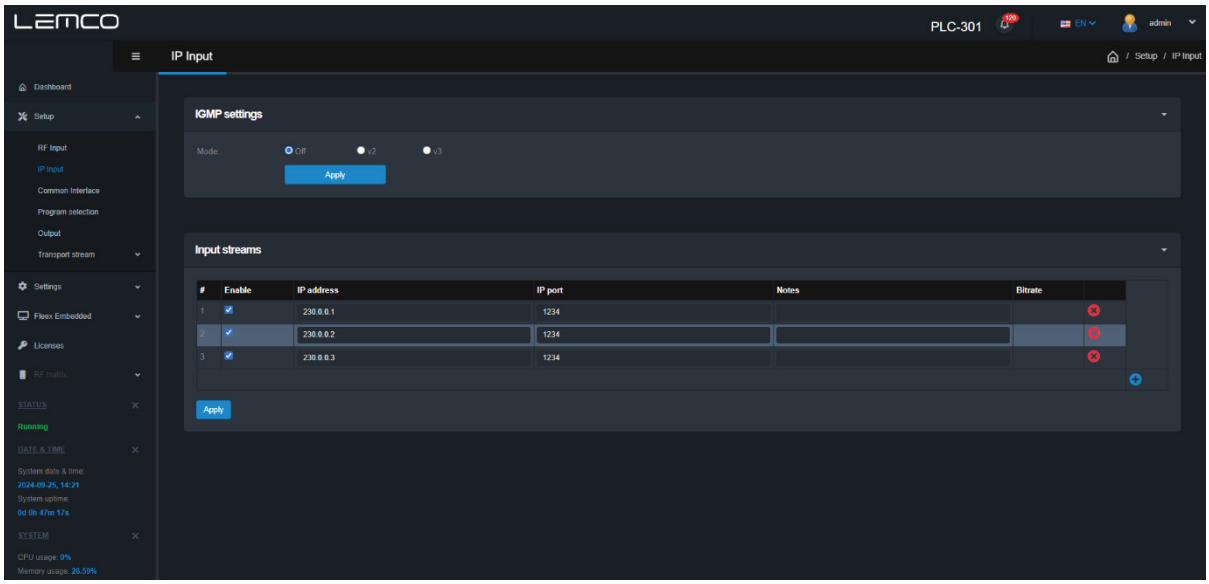
Tuner status

For each RF input the device provides several information such as tuner status (Locked/Unlocked), total bitrate, signal strength, quality and Signal to Noise Ratio (SNR) etc. as show below:

Tuner Status color	Description
Green	The tuner is locked
Yellow	The tuner is unlocked
Red	Error in the tuner
Blue	Tuner is disabled

4.2.3 - "IP Input" page

From the "IP Input" page the user is able to setup all the parameters regarding the IP reception option of the device. Both IP receiver and IP streamer share the same LAN interface which is the "TS OUT" RJ45 port.



IGMP Settings
From this section the user is able to Disable, or enable IGMP v2 or IGMP v3.

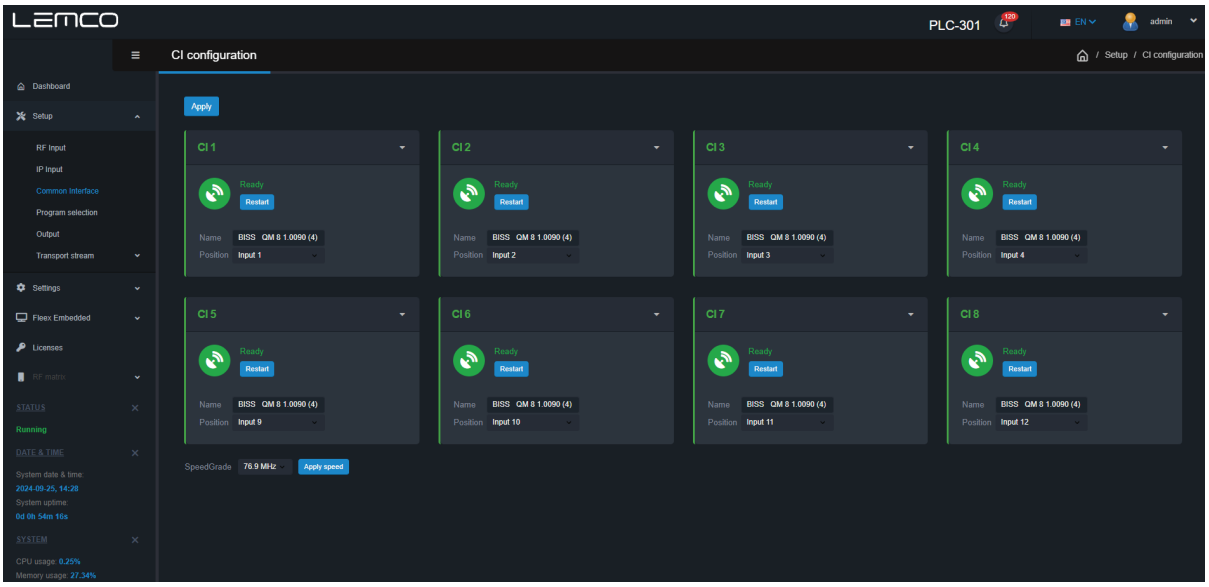
Input Streams
To add an IP input stream the user requires to click the "Add" button  and then for each IP input stream to provide the following information:

- IP address – The multicast/unicast IP address of the incoming stream
- IP port – The port of the incoming stream
- Notes – Field in which the user is able to write free notes

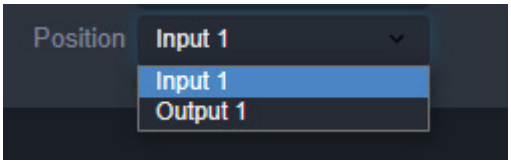
When all IP inputs streams are set, by clicking the "Apply" button the device will start receiving them. A green indicator as well as each stream bitrate will be visible under the "Bitrate" field.

4.2.4 - "Common Interface" page

The "Common Interface" page provides information regarding the eight Common Interface of the device:



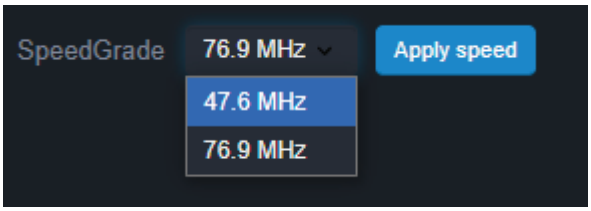
For each CI interface (CI1 to CI8) the user is able to select if the CI will be connected at the input or at the output using the "Position" field as follow:



CAM on the input
In case one CAM is selected to be at one input then the CI interface is connected after the tuner and before TS multiplexer. All the TS that is received from the tuner pass through the CI interface and then it enters the TS multiplexer of the device.
In this scenario the user is able to descramble programs coming only from the relevant Input (tuner) Eg. CI 1 will descramble programs coming only from Input No 1.

CAM on the output
In case one CAM is selected to be at one output then the CI interface is connected at the output of the TS multiplexer.
In this scenario the user is able to descramble programs coming from any input Eg. two (2) programs from Input No1 and two (2) programs from Input No2 can be combined in one TS multiplexer's output and then pass through the CAM 1. In this case the CAM 1 will descramble programs coming from both Input No 1 and No2.

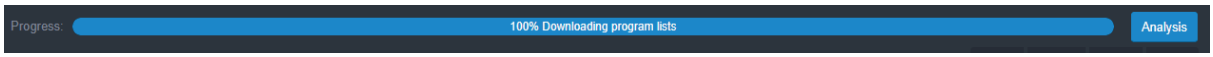
Finally, in this page the user is able to select the speed grade for each CI interface between 47.6MHz or 76.9MHz. Speed grade selects the clock working speed of the CAM.



4.2.5 - "Program Selection" page

At the "Program Selection" page the user is able manage all the available TV programs of the device as follow:

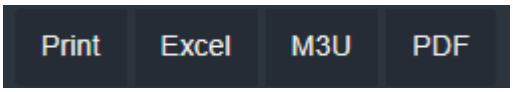
Progress Bar



At the top of the page there is a progress bar depicting the analysis status of the multiplexer. When the progress bar is at 100% it means that the multiplexer has successfully finished the analysis of all the available TV/Radio programs of all locked inputs.

The device will display all the available TV/Radio programs that it has detected from all its input that are locked to a DVB-S/S2/T/T2/C frequency.

Export Options



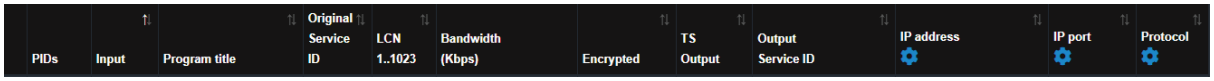
The user is able to print or export the selected TV/Radio programs in Excel, .m3u or pdf file by clicking on the appropriate button.

Search
The headend provides the ability for real-time searching of any program from the list by using the following Search field.

By entering any text in the search field, the list will automatically start to filter and display the available results that match the entered text. This feature allows users to quickly find and sort through the programs or options they are looking for, enhancing the overall user experience and simplifying the process of content management.

TV / Radio programs list table

The TV/Radio programs list table provides the following field information for each program:

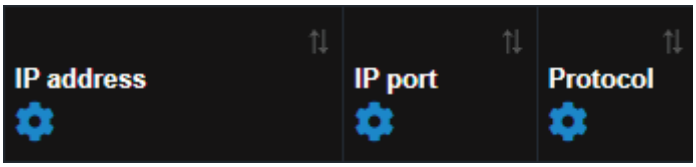


- PIDs – Submenu for PID filtering (see below)
- Input – Depicts from which input the TV/Radio programs is received
- Program Title – Displays the name of the TV/Radio program. At the same time the user can edit this field to change it.
- Original Service ID – Depicts the original Service ID number
- LCN No – which is the logic channel number of the program
- Bandwidth – which is the bitrate of the program in Kbps
- Encrypted – which depicts if the program is encrypted or not
- TS Output - To select in which multiplexer's output the TV/Radio program will be assigned.
- Descramble – The user is able to select in which CI this specific program will use for descrambling purposes.
- Output Service ID – The user is able to provide custom Service ID number
- IP address – Set the IP address of the current TV/Radio program for IPTV streaming
- Port – Set the port of the current TV/Radio program for IPTV streaming
- Protocol – Select between UDP/RTP IPTV streaming protocol for the current TV/Radio

* Most of the fields provide Sorting options by using the UP/DOWN arrows

Mass insert function

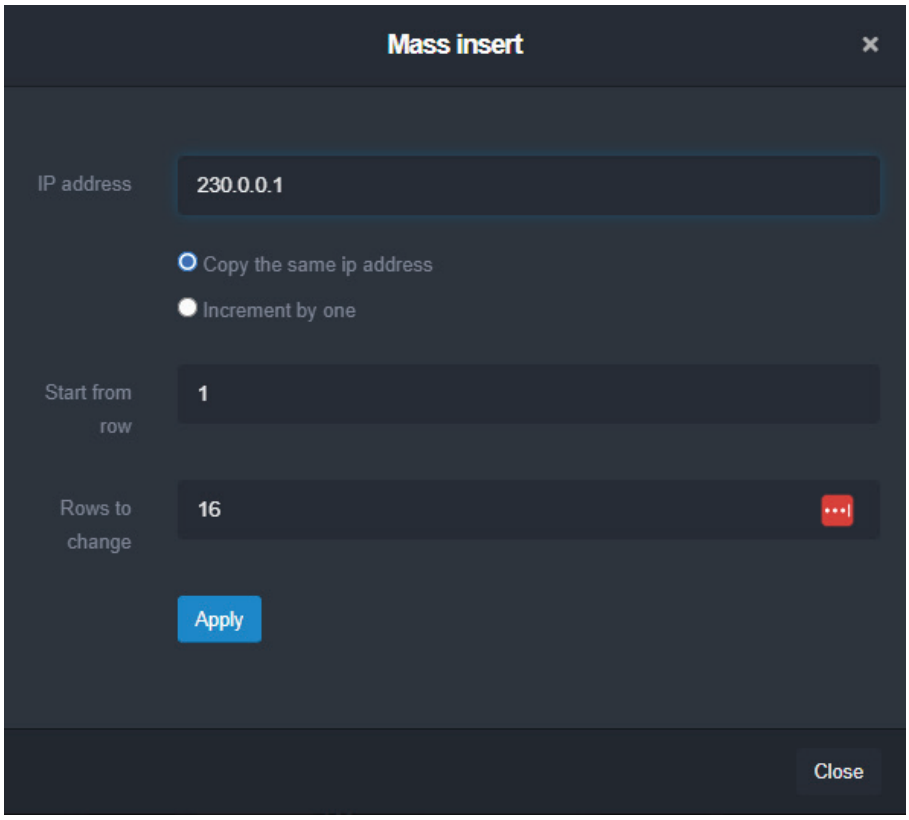
The IP address, port and Protocol fields offering quick setup by clicking the edit button as follow:



To massively insert IP addresses to selected TV/Radio programs follow the below steps:

1. Sort all the TV/Radio programs by clicking the DOWN arrow at "TS Output" column to sort all the programs that you've selected to output from the device.

2. By clicking the edit button under the title of IP Address column the following pop-up window is displayed:



3. In the IP address field insert your starting IP address

4. If you want to copy the same address in all programs, choose the radio button "Copy the same ip address". In case you want to increment by one the last octet of the IP address choose the "Increment by one" option.

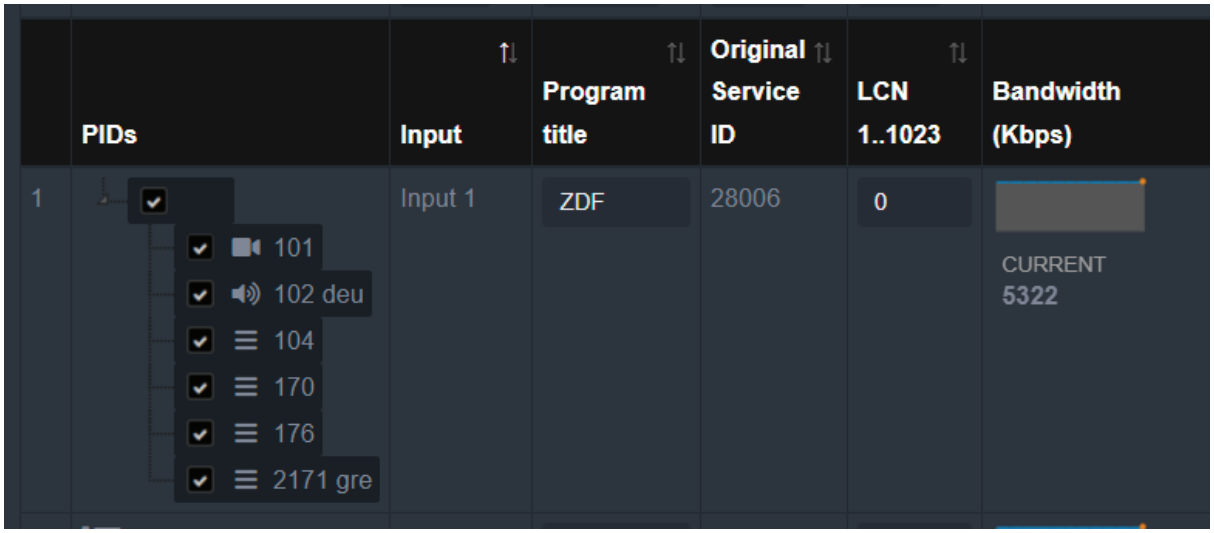
5. From the "Start from row" and "Rows to change" fields define from which specific rows the automatic procedure will begin and it will end.

6. And click the "Apply" button.

Repeat the same process for Port and Protocol field.

PID Filtering

At the second column the headend provides the ability to make PID filtering by clicking the "burger" icon  to reveal the available PIDs for each TV/Radio program as show below:



By using the checkboxes, users can easily deselect any PIDs, instructing the headend to filter them out. This feature allows users to manage and control which PIDs are processed and distributed, further enhancing the customization and flexibility of the system according to their specific needs and preferences.

Program Selection

With the drop-down menu in the "TS Output" column, users can easily assign any TV/Radio program to any of the sixteen outputs of the headend. By following the same process for each program, users can create their own custom multiplex for the sixteen output channels. This feature provides a high level of flexibility and customization, allowing users to tailor the head-end's output to their specific needs and preferences for content distribution.

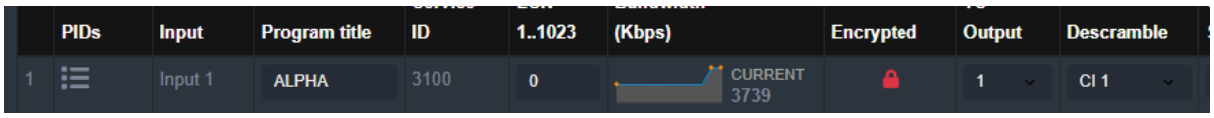
Caution!
The number of programs that a device is able to distribute depends on the resolution (SD, HD, 4K etc.), the compression (MPEG2, H.264 etc…) and in general from the total bitrate of each program.

For example, if we select the following DVB-T setting of the sixteen modulators outputs:
- Constellation: 64 QAM
- Guard Interval: 1/32
- Code rate: 7/8
- Bandwidth: 8 MHz

We will have a total output bitrate of 31.67Mbps/ RF OUT. That means that we can select as many programs as the user wants but their total bitrate must not exceed the 31.67Mbps, otherwise artifacts may occur.

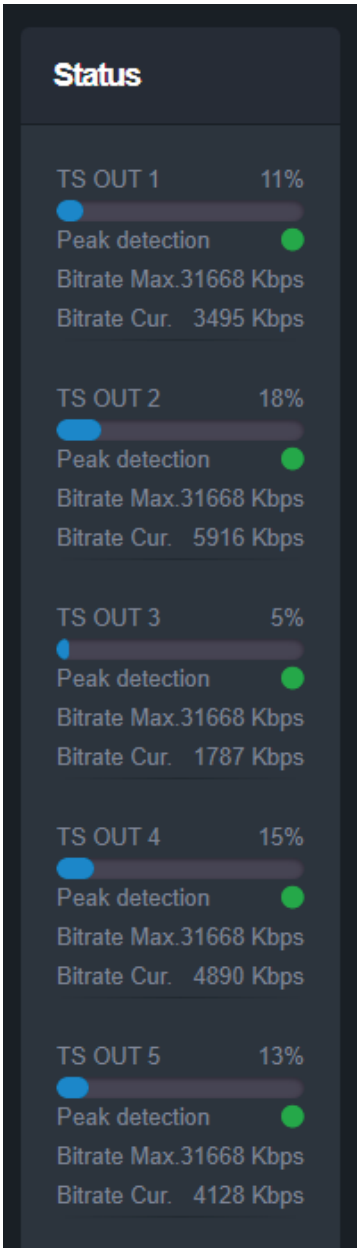
CI Selection

At the same time, the user is able to select for each TV/Radio program from which CI the specific program can be descrambled from the "Descramble" field as show below:



Caution!

The "Descramble" field will display the available options based on the CI configuration on "Common Interface" page as described above.



Status

The status section at the right provides a general idea to the user of the current payload (according to the selected programs) comparing it to the max. output payload.

It is recommended that the user must not exceed the 85% from each output, since all the bitrates are variable according to their specific content.

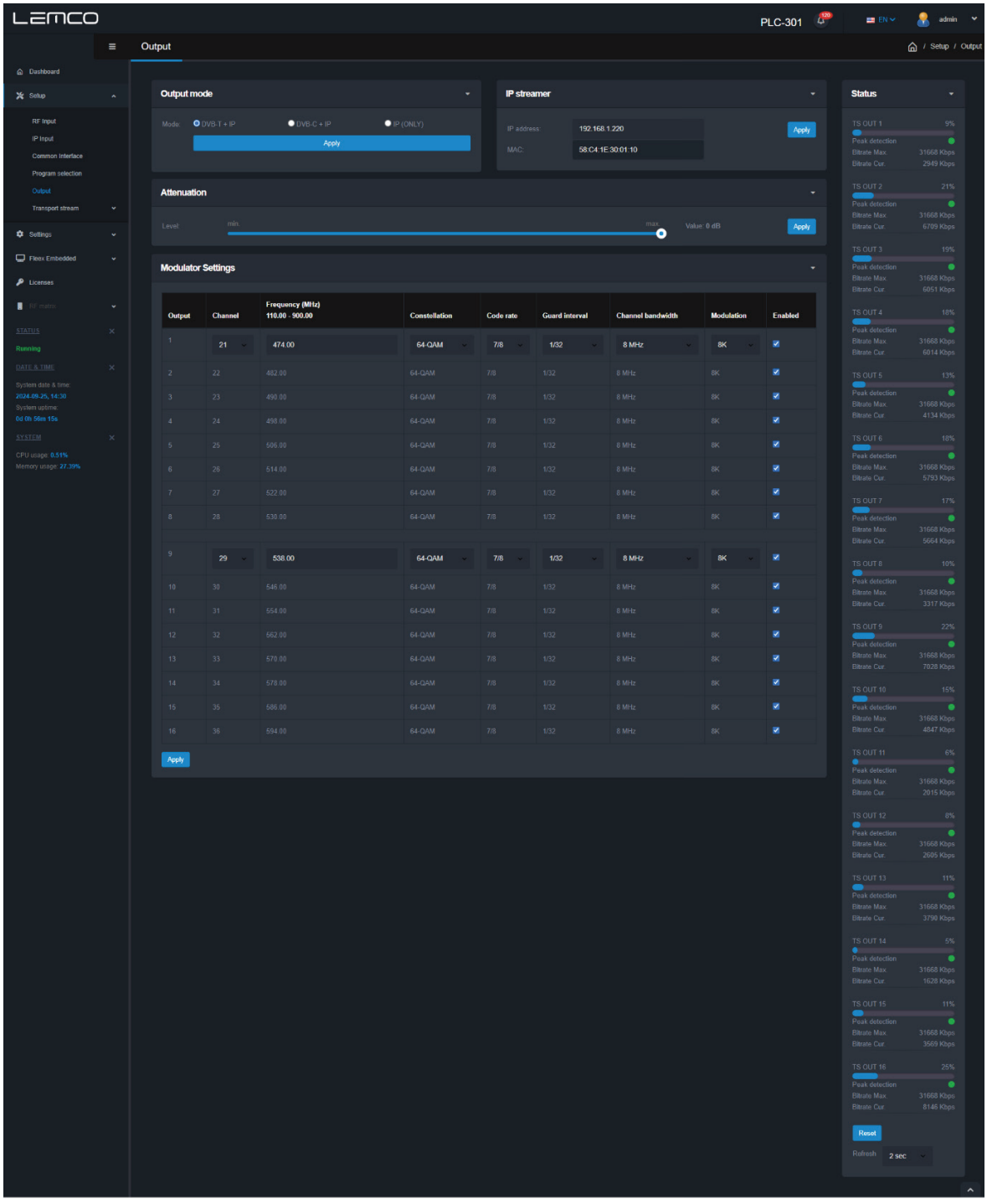
Peak Detection mechanism

As shown in the image there is a colored indicator of the peak detection mechanism, for each output transport stream. This indicates if any overflow has occurred on modulator's output bitrate with the following colors:

- Green – No overflow occurred
- Yellow – No overflow occurred but the input bitrate is close to the output bitrate
- Red – Overflow occurred. The user must decrease the input bitrate

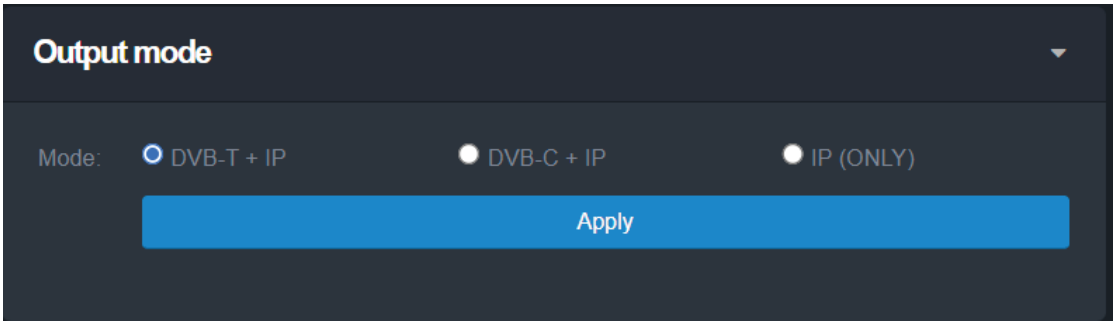
4.2.6 - "Output" page

On the "RF Output" page, the user can configure the RF output settings for the device as shown below:



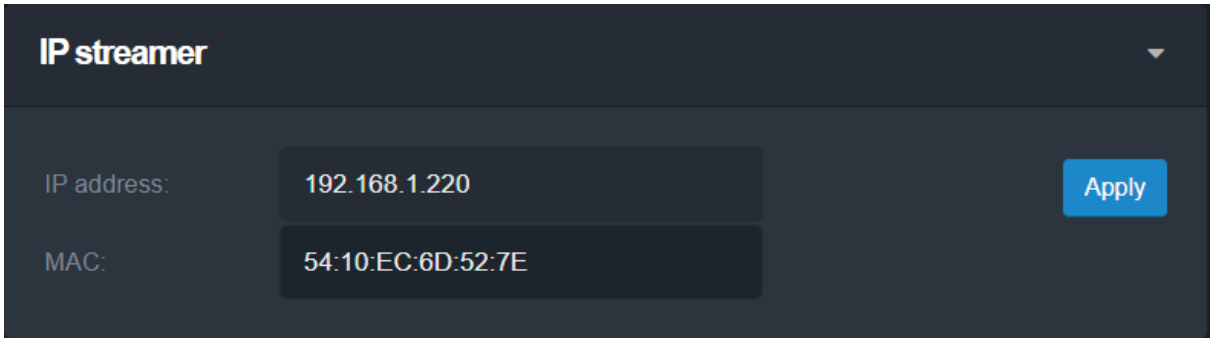
Output Mode

With the use of the radio buttons the user is able to select the mode that the device will operate as follows:



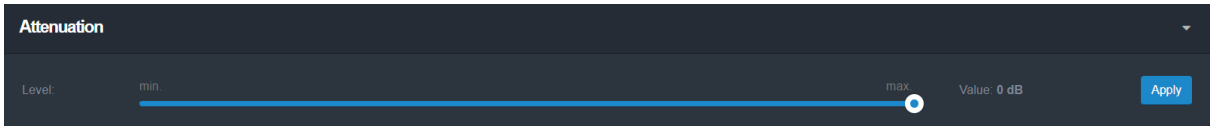
DVB-T: 16 x modulator working in DVB-T standard + IP streaming
DVB-C: 16 x modulator working in DVB-C standard + IP streaming
IP only: All modulators are disabled, the device does IP streaming ONLY

IP streamer



The IP streamer section provides the IP address of the headend's streamer that can be used for PING purposes as well as it's MAC address.

Attenuation



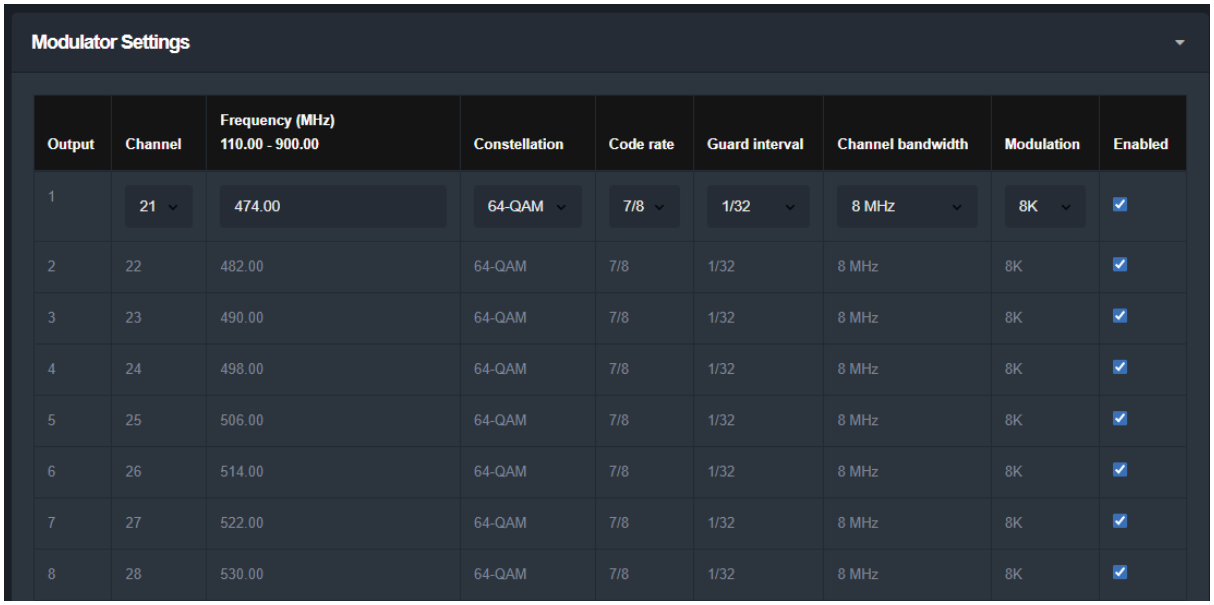
The device headend provides an electronic embedded -31.5dB attenuator to provide the ability to the user to increase or decrease the total RF output level of all outputs of the headend at the same time.

Modulator Settings

All the RF output channels from the device are working in adjacent frequencies based on the DVB standard as follows:

DVB-T mode
In DVB-T mode, the 16x RF output channels are working in 2x different groups of 8x adjacent RF channels (2x8). The user is able to select the modulation parameters only from the first channel of the group and then all the other RF channels will use the same.

DVB-C mode
In DVB-C mode, the 16x RF output channels are working in 8x different groups of 2x adjacent RF channels (8x2). The user is able to select the modulation parameters only from the first channel of the group and then all the other RF channels will use the same.



Output	Channel	Frequency (MHz) 110.00 - 900.00	Constellation	Code rate	Guard interval	Channel bandwidth	Modulation	Enabled
1	21	474.00	64-QAM	7/8	1/32	8 MHz	8K	☑
2	22	482.00	64-QAM	7/8	1/32	8 MHz	8K	☑
3	23	490.00	64-QAM	7/8	1/32	8 MHz	8K	☑
4	24	498.00	64-QAM	7/8	1/32	8 MHz	8K	☑
5	25	506.00	64-QAM	7/8	1/32	8 MHz	8K	☑
6	26	514.00	64-QAM	7/8	1/32	8 MHz	8K	☑
7	27	522.00	64-QAM	7/8	1/32	8 MHz	8K	☑
8	28	530.00	64-QAM	7/8	1/32	8 MHz	8K	☑

For each modulator output in DVB-T mode as the above example the user is able to setup the following parameters:

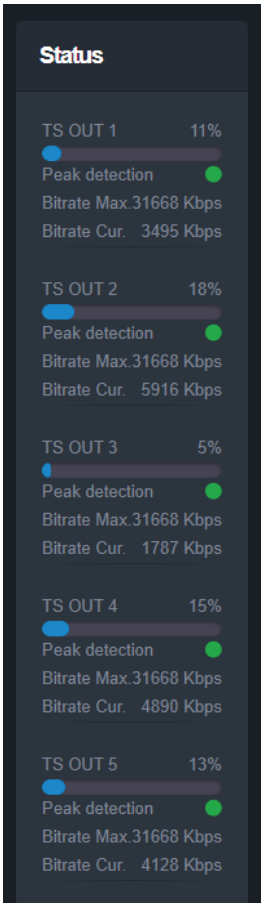
- Channel – Set the desired output channel in channel format
- Frequency – Set output frequency of the first modulator*
- Constellation – Set the constellation of the first modulator*
- Code Rate – Set the code rate of the first modulator*
- Guard Interval – Set the guard interval of the first modulator*
- Channel Bandwidth – Set the channel bandwidth of the first modulator*
- Modulation – Set the modulation type of the first modulator*
- Enable/Disable – Enable or disable the current modulator

In DVB-C the available fields are the following:

- Frequency – Set output frequency of the first modulator*
- Constellation – Set the constellation of the first modulator*
- Symbol Rate – Set the Symbol rate of the first modulator*
- Frequency Step – Set the frequency step of the first modulator*

* All the sixteen outputs of the device operate in adjacent RF output channels. This means that the user setups only the first modulator output and all the other three modulators have the same settings and automatically are being programmed in adjacent channels.

E.g. If the user sets the CH21 in UHF band on modulator No1 the other three modulators will be automatically set to CH22, CH23 and CH24, respectively.



Status
The status section at the right provides a general idea to the user of the current payload (according to the selected programs) comparing it to the max. output payload.

It is recommended that the user must not exceed the 85% from each output, since all the bitrates are variable according to their specific content.

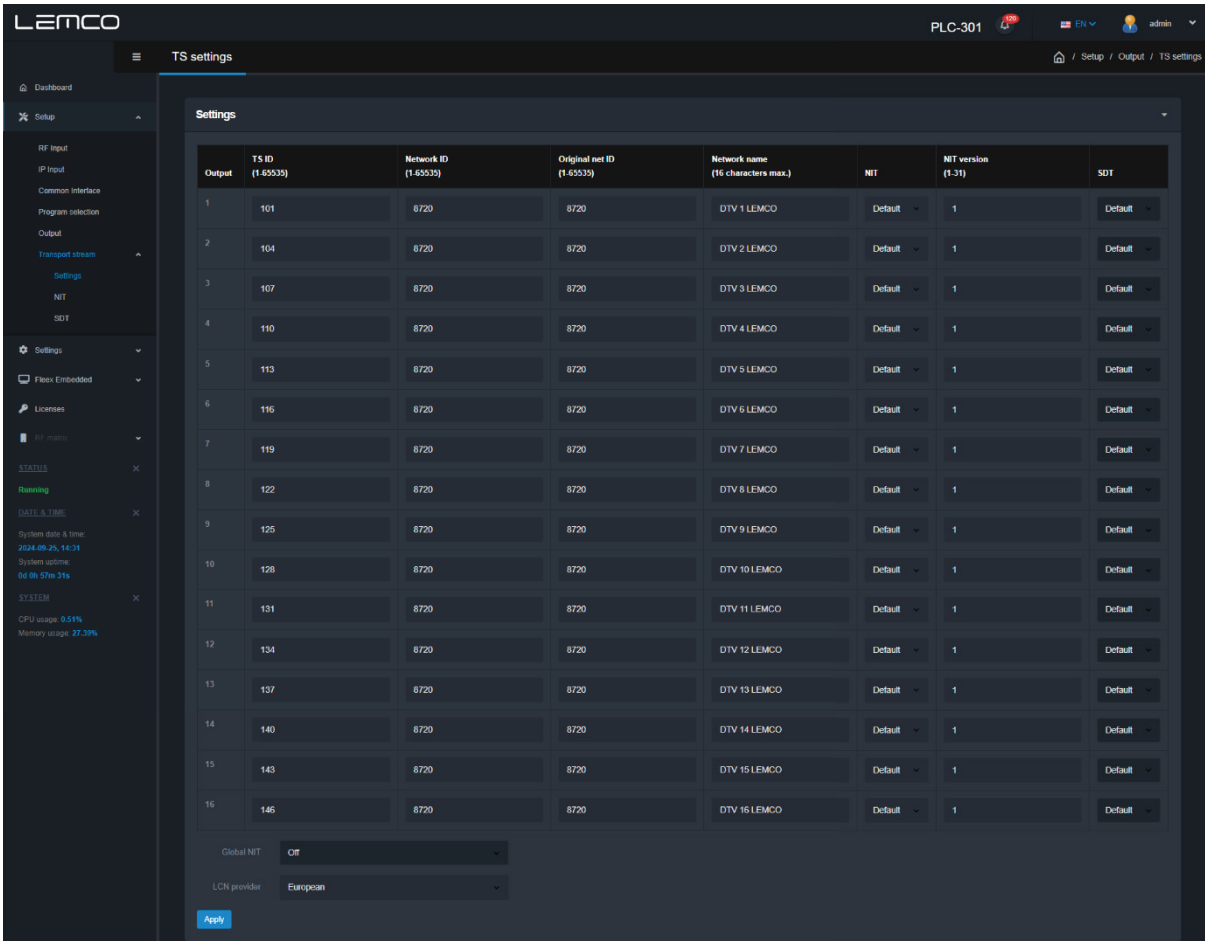
Transport Stream

4.2.7 - "Settings" page

In this section the user is able to setup all the TS settings of the sixteen-output multiplexes of the device as shown below:

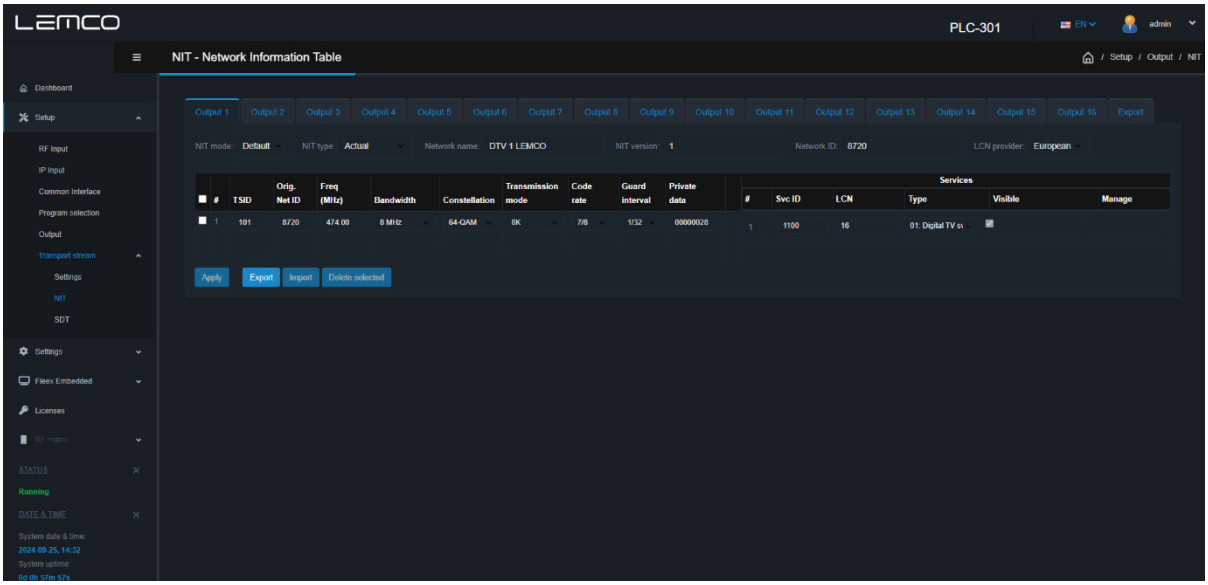
For each multiplex output the user can set the following settings:

TS ID: Which is the ID No of the specific multiplex (1…65535)
Network ID: Which is the Net ID No of the specific multiplex (1…65535)
Original Net ID: Which is the Org. Net ID No of the specific multiplex (1…65535)
Network Name: Which is the network name of the specific multiplex
NIT: Choose from Default, Global and Custom
NIT version: From 1 to 31
SDT: Select Default or Custom
LCN provider: Choose the appropriate LCN provider (EACEM, ITC, Nordig, APN)



4.2.8 - "NIT" page

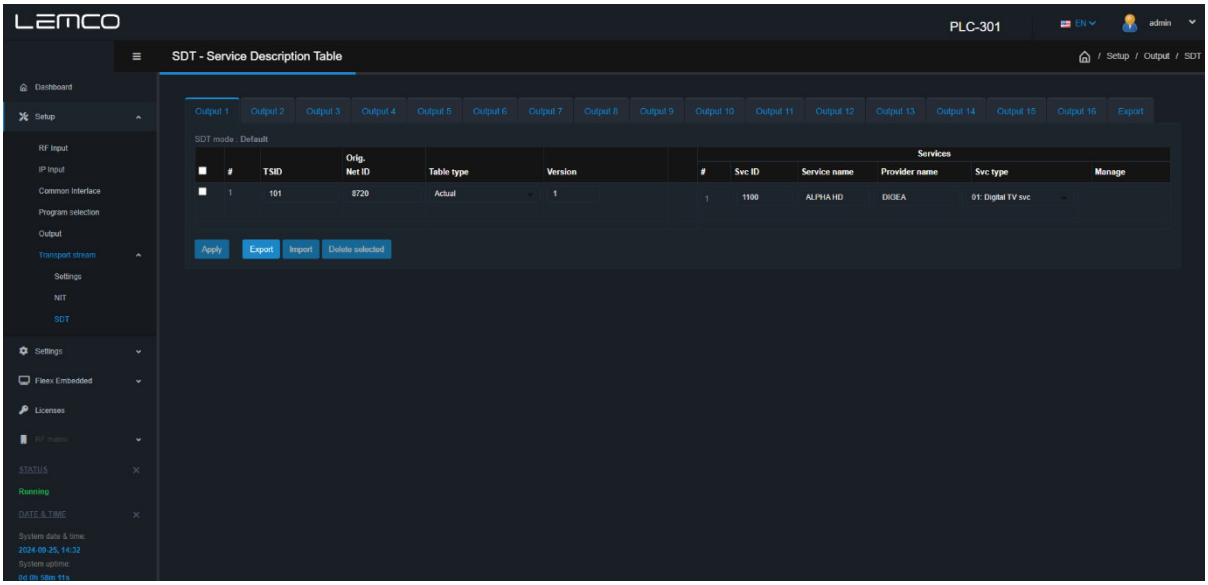
In this section the user is able to create custom NIT table for each of the sixteen outputs of the device as shown below:



For more information on how to create a custom NIT/SDT table please refer to "Lemco custom NIT/SDT guideline.pdf" document in Lemco's website.

4.2.9 - "SDT" page

In this section the user is able to create custom SDT table for each of the sixteen outputs of the device as shown below:

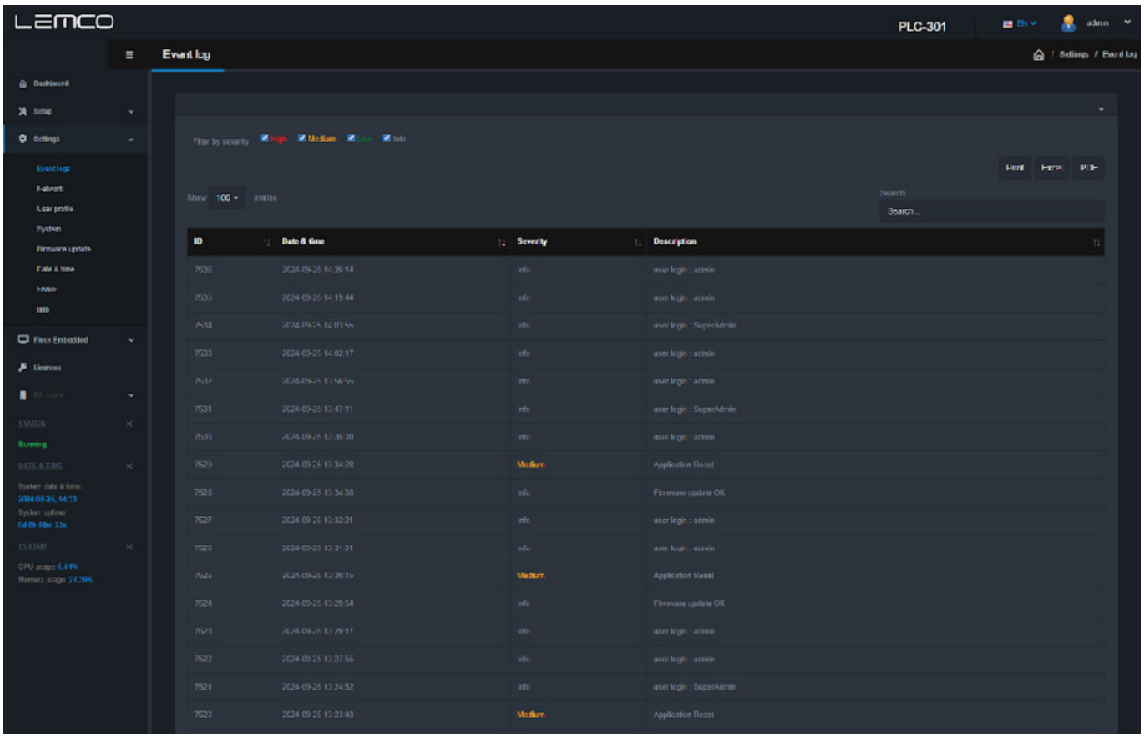


For more information on how to create a custom NIT/SDT table please refer to “Lemco custom NIT/SDT guideline.pdf” document in Lemco’s website.

Settings

4.2.10 - “Event log” page

In “Event log” page the system logs all the last one thousand (1000) events occurs in the device during its operation. These logs are divided in three different categories based on their priority as follow:

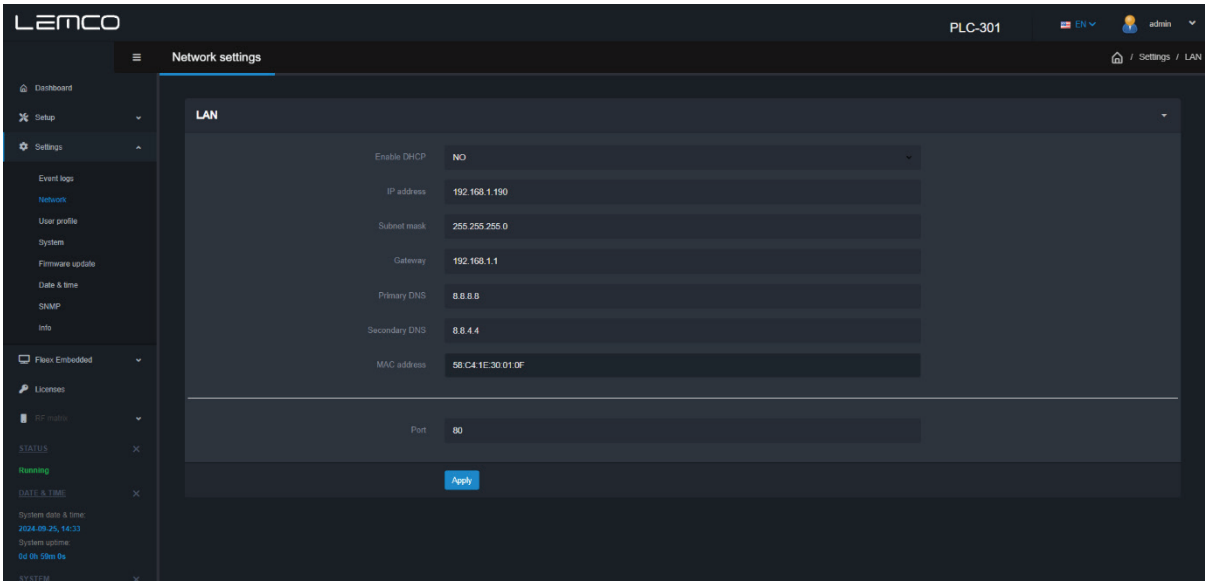


- High – With red color the system indicates event logs which are of high priority
- Medium – With yellow color the system indicates event logs which are of high priority
- Low – With green color the system indicates event logs which are of high priority
- Info – With grey color the system indicates event logs which are of high priority

The user has the ability to print or export in excel or pdf file all the selected events.

4.2.11- “Network” page

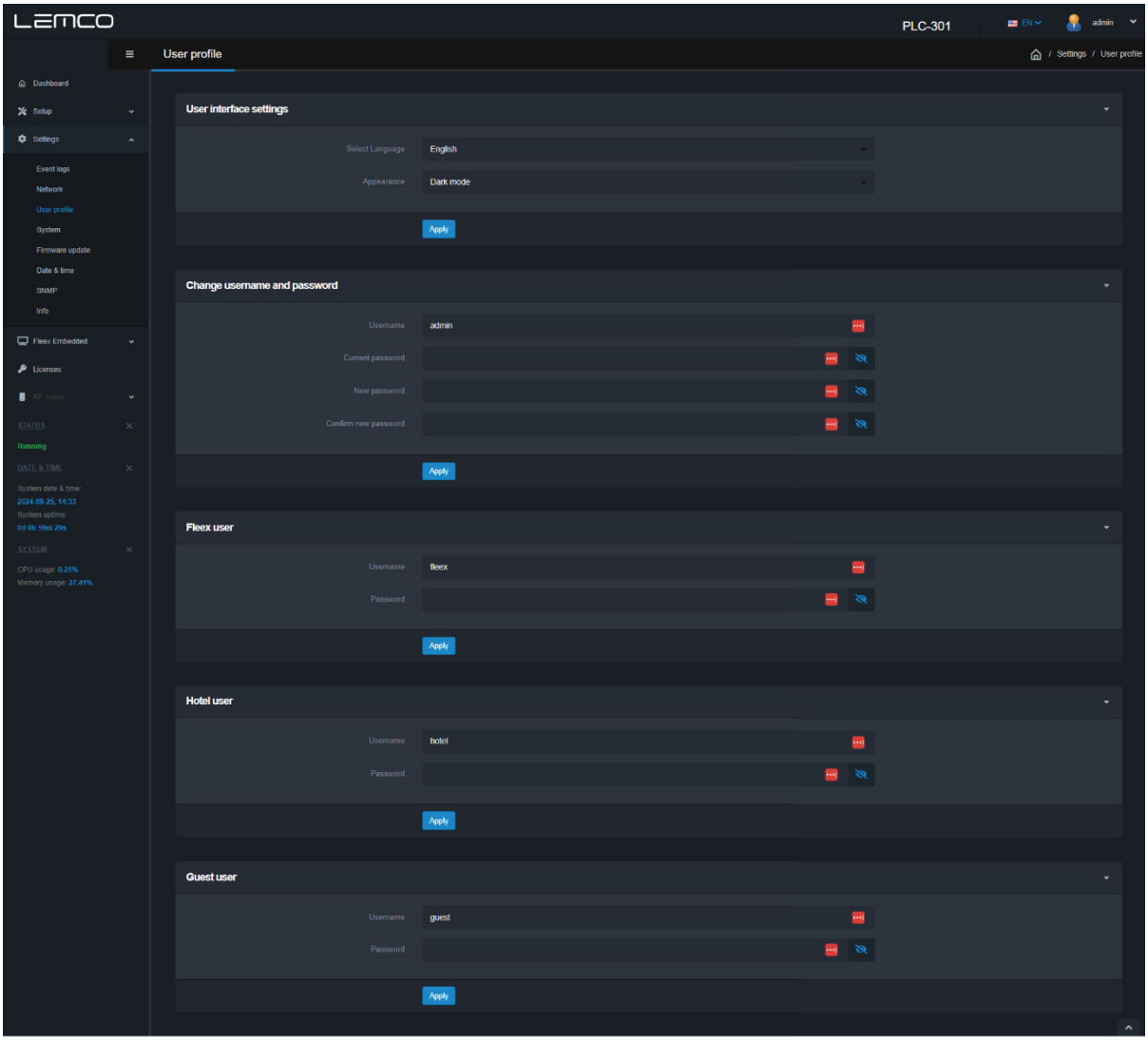
On the “Network” page, users can set up all the parameters related to the LAN control of the device as follows:



- DHCP – Enable or disable DHCP
- IP address: Set a static IP address for controlling the device
- Subnet mask: Set the specific Subnet mask
- Gateway: Set the gateway’s IP address
- Primary DNS: Set the IP address of the primary DNS
- Secondary DNS: Set the IP address of the secondary DNS
- Port: Assign the control port
- MAC address: Depicts the MAC address of the LAN control

4.2.12 – "User profile" page

On "User profile" section the user is able to do the following:



- From the "Select Language" field to select the language of the interface
- From the "Appearance" field to select the Light of dark mode theme.

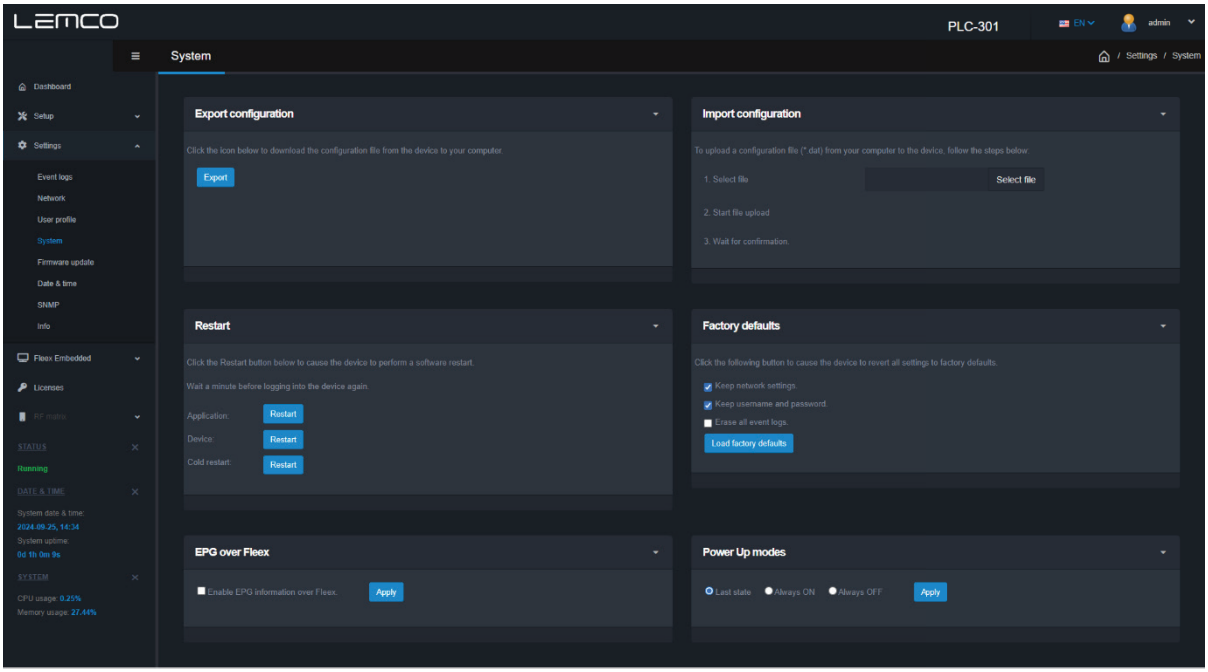
The device supports several user profiles as follow:

Profile Name	Username	Password	Description
Admin	admin	12345	The user has full read/write privileges to all pages
Fleex	fleex	12345	The user has full read/write privileges only to Fleex section
Hotel	hotel	12345	The user has full read/write privileges only to "Home page" and "Info" page from Fleex Embedded.
Guest	guest	12345	The user has full read privileges

Caution!
• In case of factory default procedure, the username and password will be reset unless the check box "Keep username & password after applying factory defaults" is selected.

4.2.13 - "System" page

On system page the user is able to do the following:



Import/Export
• Export: Save the headend' s configuration in a specific .dat format file.
• Import: Upload a previously saved configuration .dat file to the device

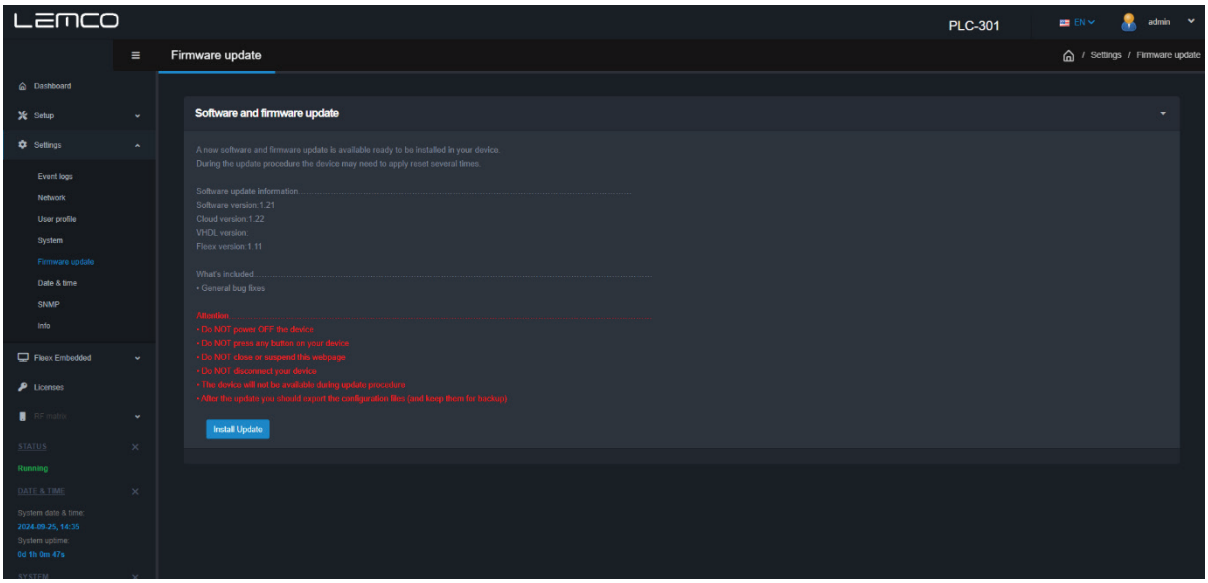
Restart
The device offers the following restart options:
• Application – The device will apply restart only to software application that controls the device.
• Device – The device will apply restart to its Linux Operating System.
• Cold – The device will power OFF and after 10 seconds will power ON automatically.

Factory Defaults
By clicking on the "Load factory defaults" button the device will restore to factory defaults supporting the following options:

Check Box	Description
Keep network settings	If enabled, the device will keep Network settings upon factory default
Keep username and password	If enabled, the device will keep username and password.
Erase all event logs	If enabled, the device will erase all event logs during factory default procedure.

4.2.14 - "Firmware update" page

On "Firmware update" section the user is able to apply a new firmware update to the device.



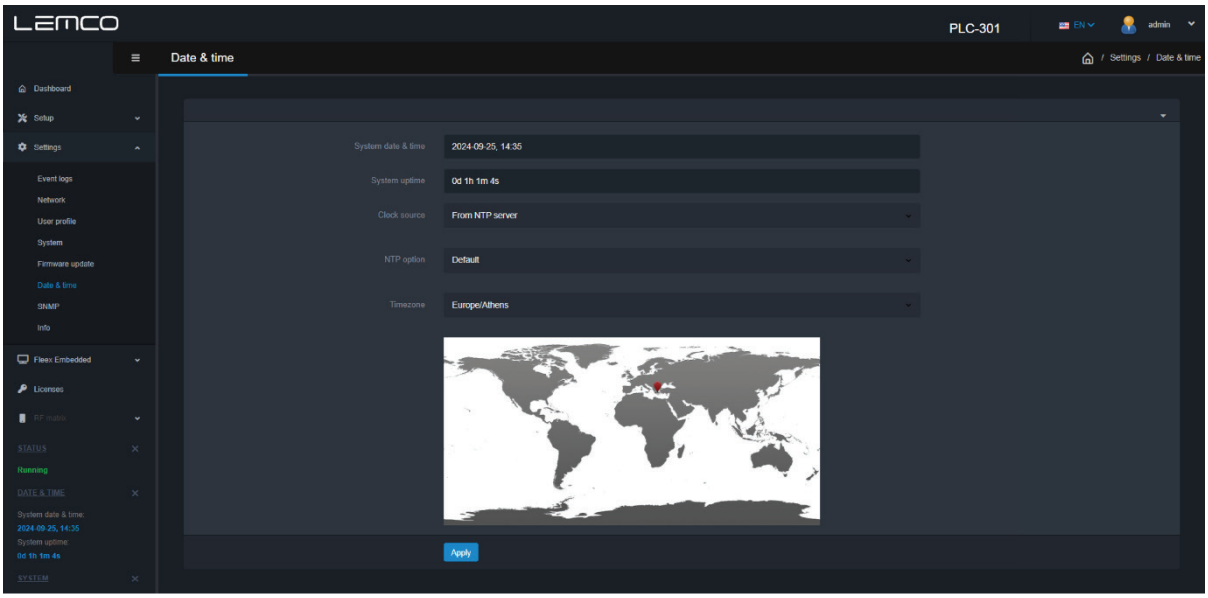
The device automatically downloads the available firmware update from the cloud server and notifies the user that there is a new firmware update. The user by clicking the "Install" button the device does the update automatically and reboots itself…

The whole procedure might take up to 2 min and it does not affect the current configuration of the device.

At the same time, device offers offline firmware update by uploading a firmware update .bin file manually.

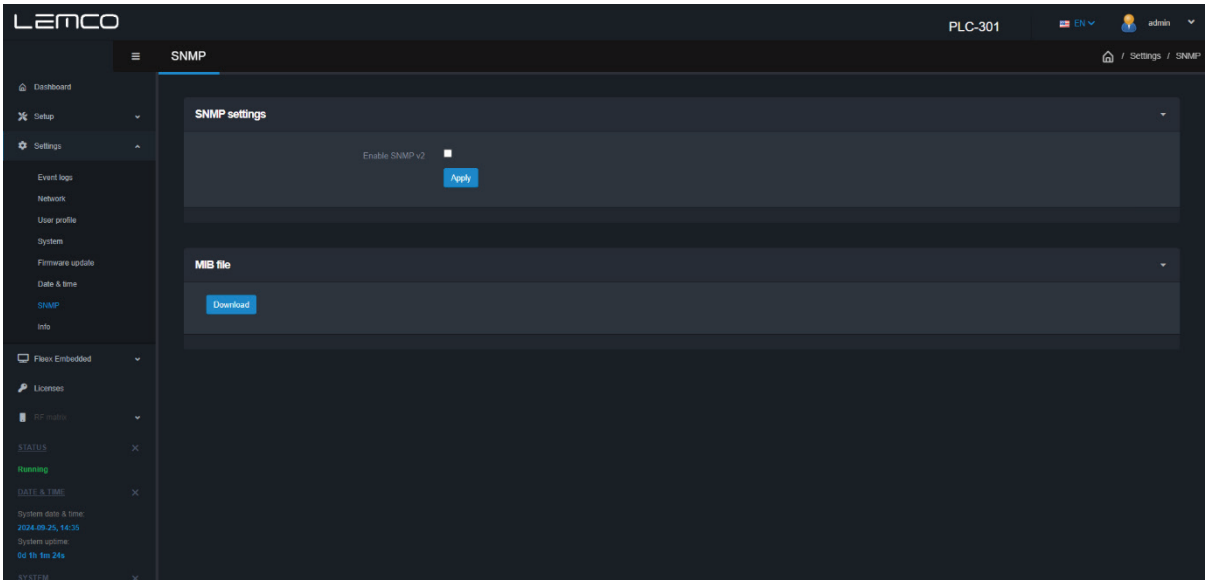
4.2.15 - "Date & Time" page

On "Date & Time" section the user is able to select the time zone for the device by using the "Timezone" drop down menu:



4.2.16 - "SNMP" page

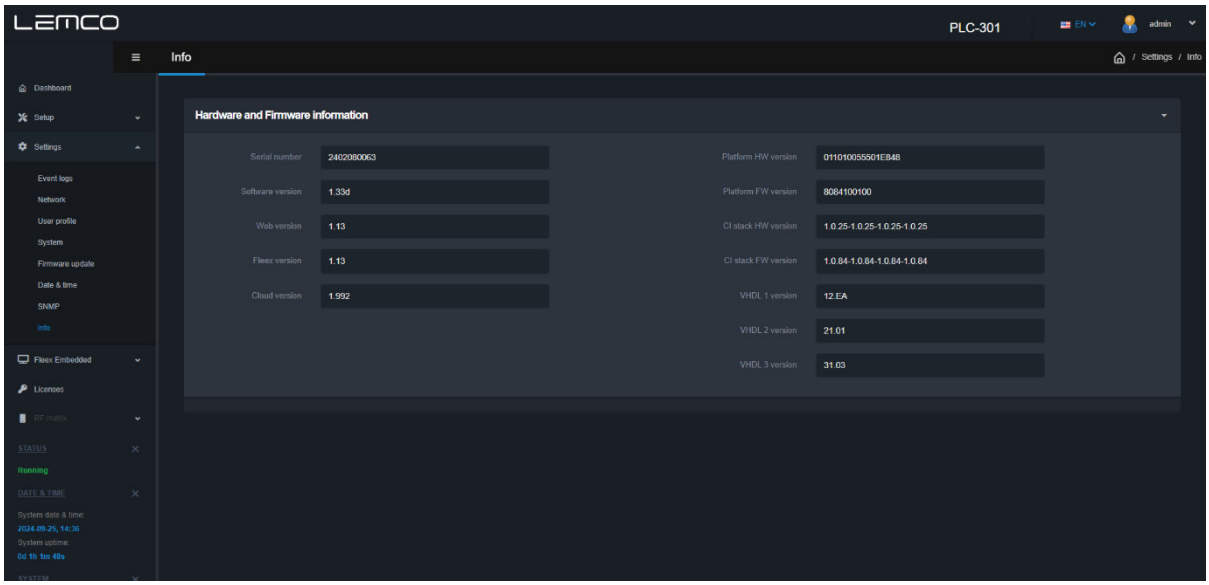
On this section, the user is able to setup the SNMP interface of the device.



- The device supports SNMP v2
- To use the SNMP client feature of the device a SNMP manager software is required
- To export the .MIB file of the device the user must click the Download button from MIB file section.

4.2.17- "Info" page

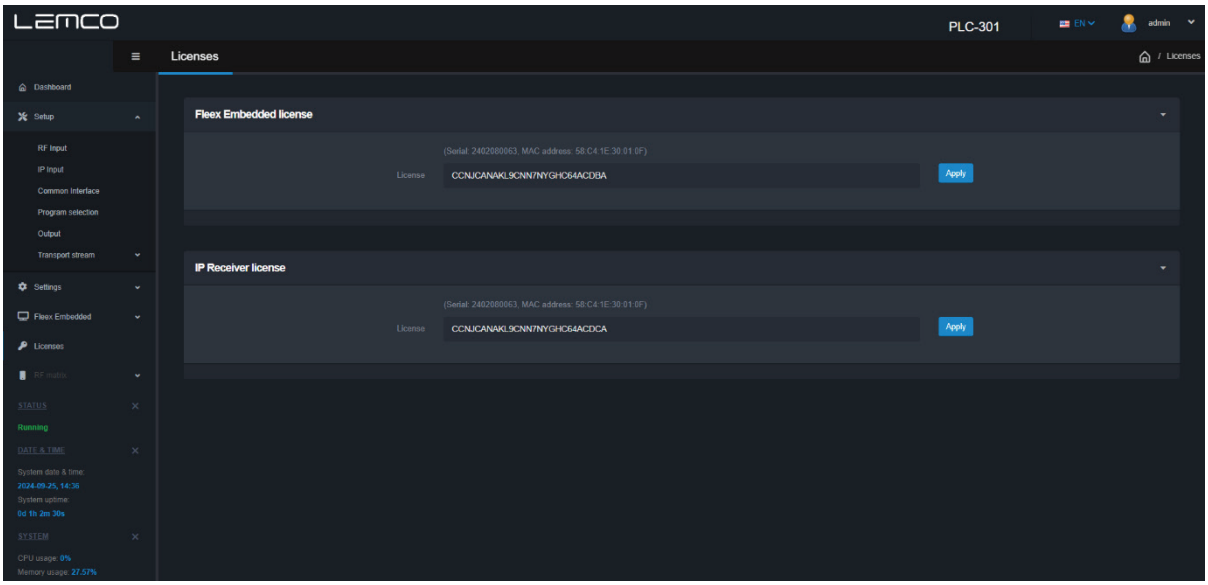
The "Info" page provides several information of the device as follow:



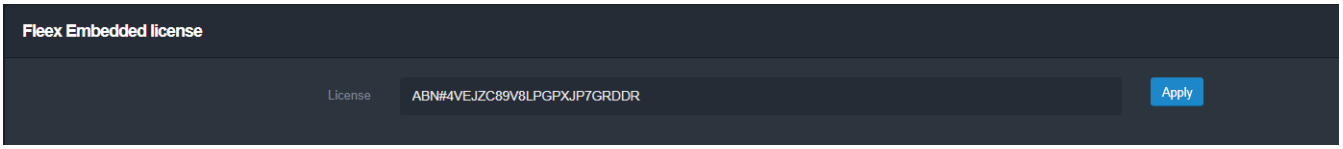
- Serial number of the device
- Software application – Which is the version of the software application
- Web version – Which is the version of the web application
- Fleex version – Which is the version of the Fleex Embedded
- Cloud version - Which is the version of the firmware package.
- Platform HW version – Hardware version of the FPGAs
- Platform FW version – Firmware version of the FPGAs
- CI stack HW version – Hardware version of the Common Interface
- CI stack FW version – Firmware version of the Common Interface
- VHDL 1 version – VHDL version of the FPGA No1
- VHDL 2version – VHDL version of the FPGA No2
- VHDL 3 version – VHDL version of the FPGA No3

4.2.18- "Licenses" page

From the "Licenses" page the user is able to enable extra features and options of the device as follows:



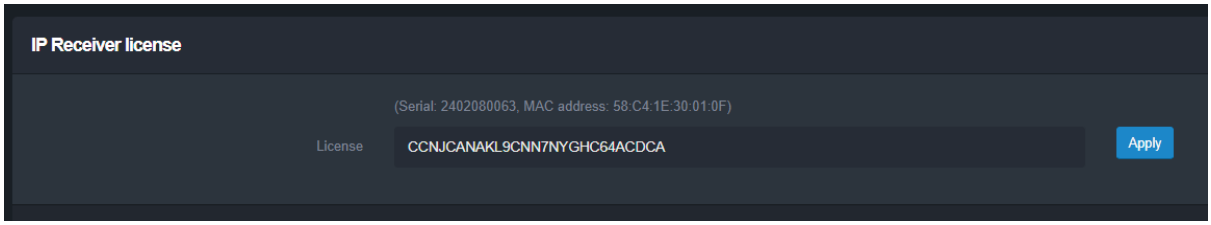
Fleex Embedded license
To enable the Fleex Embedded on the specific device the user has to enter the license in the following field and click the "Apply" button:



*More information regarding Fleex Embedded can be found here: www.fleex.gr

IP Receiver license

To enable the IP receiver option on the specific device the user has to enter the license in the following field and click the "Apply" button:



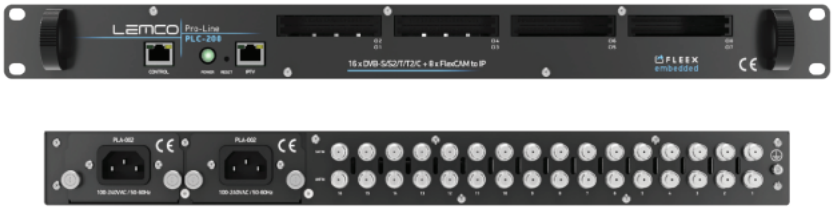
*To obtain any of the above license please contact us at: info@lemco.gr

5. TECHNICAL SPECIFICATIONS

PROLINE

PLC-200

16 x DVB-S/S2/T/T2/C + 8 x FlexCAM to IP



Input	
Type	16 x DVB-S/S2/T/T2/C
Frequencies	950…2150 MHz DVB-S/S2
	118…900MHz DVB-T/T2/C
Connector	75Ω - F, female
Loop-through connector	No
LNB	
Voltage	OFF / 13V / 18V
Current	Less than 400mA (per input)
22 kHz signal	ON / OFF
22 kHz signal - Voltage	0.65V ± 0.35V
22 kHz signal - Frequency	22 KHz ± 4Hz
22 kHz signal - DiSEqC	1.0 (Port A, B, C, D)
DVB-S (IN)	
Symbol rate	1 - 45 MBaud
Roll off factor	0.35
Code rate	1/2, 2/3, 3/4, 5/6, 7/8 (Automatic)
Spectral inversion	Reverse, Non-reverse (Automatic)
DVB-S2 (IN)	
Constellation	QPSK, 8PSK (Automatic)
Symbol rate	1 - 45 MBaud (QPSK) - 1 - 30 MBaud (8PSK)
Roll off factor	0.2 / 0.35 (Automatic)
Code rate	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 8/10 (QPSK-Automatic)
	3/5, 2/3, 3/4, 5/6, 8/9, 9/10 (8PSK-Automatic)
Spectral inversion	Reverse, Non-reverse (Automatic)
CI Interface	
Number of Common Interfaces	8x (in total)
Connectror	PCMCIA (front access)
Max. Frequency	77MHz
DVB-T (IN)	
Bandwidth	6, 7, 8 MHz
Mode	2K, 8K
Constellation	QPSK, 16QAM, 64QAM
Guard interval	1/4, 1/8, 1/16, 1/32
Code rate	1/2, 2/3, 3/4, 5/6, 7/8
DVB-T2 (IN)	
Bandwidth	5, 6, 7, 8 MHz
Mode	1K, 2K, 4K, 8K, 16K, 32K (Included extended mode)
Constellation	QPSK, 16QAM, 64QAM, 256QAM
Code rate	1/2, 3/5, 2/3, 3/4, 4/5, 5/6
Multi PLP support	Yes
DVB-C (Annex A,B,C)	
Bandwidth	5, 6, 7, 8 MHz
Mode	Automatic modulation detection
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Transport Stream Processing	
Pool technology support	Yes
Services	User selection by service names or Service ID
Automatic regeneration	PAT, CAT, SDT, PMTs, EITs tables
NIT	Pass-through, custom, automatic
Custom NIT/SDT creation	Yes
PCR	Re-stamping
PCR correction	Yes
LCN support	Yes
PID filtering	Yes
EPG information	Yes over RF and IP

IP Streaming (OUT)	
IP TS Out	Yes
Protocol	UDP / RTP (Multicast/Unicast)
Speed	1 Gbit (800 Mbps in IP only mode)
Type	Up to 128 x SPTS or 16 x MPTS
SDP/SAP Support	Yes
IP Streaming (IN)	
Optional	Requires extra license
IP TS In	Yes
Protocol	UDP / RTP (Multicast/Unicast)
Speed	1 Gbit (800 Mbps)
Type	Up to 112 x SPTS
IGMP snooping	Yes, v2 and v3
Programming Interface	
Operating system	Linux OS
Ethernet webserver	Yes, embedded webserver
Speed	100/1000 Mbps
Connector	RJ45
Browser compatibility	Chrome, Firefox, Safari, Opera, Edge et al.
EAN-13	
Code	5213009761833
General	
Power supply	230-240 VAC
Frequency range	50…60Hz
Number of power supplies	Up to two(2)
Hot-swap technology	Yes
Power supply consumption	~60VA
Operating temperature	0 °C to 40 °C
Storage temperature	-10 °C to +70 °C
Humidity	Up to 90%
Dimensions	480 x 295 x 43.5mm
Mounting	1U rack
Weight	4.55 Kg

PROLINE

PLC-201

16 x DVB-S/S2/S2X + 8 x FlexCAM to IP

	16 x DVB-S/S2/S2X
Frequencies	950…2150 MHz
	75Ω - F, female
Loop-through connector	Yes
	OFF / 13V / 18V
	Less than 400mA (per input)
22 kHz signal	ON / OFF
22 kHz signal - Voltage	0.65V ± 0.35V
22 kHz signal - Frequency	22 KHz ± 4Hz
22 kHz signal - DiSEqC	1.0 (Port A, B, C, D)
DVB-S (IN)	
Symbol rate	1 - 45 MBaud
Roll off factor	0.35
	1/2, 2/3, 3/4, 5/6, 7/8 (Automatic)
Spectral inversion	Reverse, Non-reverse (Automatic)
DVB-S2 (IN)	
Constellation	QPSK, 8PSK (Automatic)
Symbol rate	1 - 45 MBaud (QPSK) - 1 - 30 MBaud (8PSK)
Roll off factor	0.2 / 0.35 (Automatic)
	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 8/10 (QPSK-Automatic)
	3/5, 2/3, 3/4, 5/6, 8/9, 9/10 (8PSK-Automatic)
Spectral inversion	Reverse, Non-reverse (Automatic)
DVB-S2X (IN)	
	EN302 307-1 V1.4.1
Constellation	QPSK, 8PSK (automatic)
Symbol rate	1 - 45 MBaud (QPSK) / 1 - 30 MBaud (8PSK)
Roll off factor	Anó 0.05 to 0.35 (automatic)
	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 8/10 (QPSK- automatic)
	3/5, 2/3, 3/4, 5/6, 8/9, 9/10 (8PSK- automatic)
Multi-stream support	Yes
T2MI MPLP (multiple PLP) signa	Yes
CI Interface	
Number of Common Interfaces	8x (in total)
Connectror	PCMCIA (front access)
Max. Frequency	77MHz
Transport Stream Processing	
Pool technology support	Yes
	User selection by service names or Service ID
Automatic regeneration	PAT, CAT, SDT, PMTs, EITs tables
	Pass-through, custom, automatic
Custom NIT/SDT creation	Yes
	Re-stamping
PCR correction	Yes
LCN support	Yes
PID filtering	Yes
EPG information	Yes over RF and IP

IP Streaming (OUT)	
IP TS Out	Yes
Protocol	UDP / RTP (Multicast/Unicast)
Speed	1 Gbit (800 Mbps in IP only mode)
Type	Up to 128 x SPTS or 16 x MPTS
SDP/SAP Support	Yes
IP Streaming (IN)	
Optional	Requires extra license
IP TS In	Yes
Protocol	UDP / RTP (Multicast/Unicast)
Speed	1 Gbit (800 Mbps)
Type	Up to 112 x SPTS
IGMP snooping	Yes, v2 and v3
Programming Interface	
Operating system	Linux OS
Ethernet webserver	Yes, embedded webserver
Speed	100/1000 Mbps
Connector	RJ45
Browser compatibility	Chrome, Firefox, Safari, Opera, Edge et al.
EAN-13	
Code	5213009761840
General	
Power supply	230-240 VAC
Frequency range	50…60Hz
Number of power supplies	Up to two(2)
Hot-swap technology	Yes
Power supply consumption	~65VA
Operating temperature	0 °C to 40 °C
Storage temperature	-10 °C to +70 °C
Humidity	Up to 90%
Dimensions	480 x 295 x 43.5mm
Mounting	1U rack
Weight	4.55 Kg

PROLINE

PLC-202

8 × DVB-S/S2/T/T2/C + 8 × DVB-S/S2/S2X + 8 x CI to IP

Input	
Type	8 × DVB-S/S2/T/T2/C + 8 × DVB-S/S2/S2X
Frequencies	950…2150 MHz
Connector	75Ω - F, female
Loop-through connector	Yes
LNB	
Voltage	OFF / 13V / 18V
Current	Less than 400mA (per input)
22 kHz signal	ON / OFF
22 kHz signal - Voltage	0.65V ± 0.35V
22 kHz signal - Frequency	22 KHz ± 4Hz
22 kHz signal - DiSEqC	1.0 (Port A, B, C, D)
DVB-S (IN)	
Symbol rate	1 - 45 MBaud
Roll off factor	0.35
Code rate	1/2, 2/3, 3/4, 5/6, 7/8 (Automatic)
Spectral inversion	Reverse, Non-reverse (Automatic)
DVB-S2 (IN)	
Constellation	QPSK, 8PSK (Automatic)
Symbol rate	1 - 45 MBaud (QPSK) - 1 - 30 MBaud (8PSK)
Roll off factor	0.2 / 0.35 (Automatic)
Code rate	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 8/10 (QPSK-Automatic)
	3/5, 2/3, 3/4, 5/6, 8/9, 9/10 (8PSK-Automatic)
Spectral inversion	Reverse, Non-reverse (Automatic)
DVB-S2X (IN)	
Standard	EN302 307-1 V1.4.1
Constellation	QPSK, 8PSK (automatic)
Symbol rate	1 - 45 MBaud (QPSK) / 1 - 30 MBaud (8PSK)
Roll off factor	Aná 0.05 to 0.35 (automatic)
Code rate	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 8/10 (QPSK- automatic)
	3/5, 2/3, 3/4, 5/6, 8/9, 9/10 (8PSK- automatic)
Multi-stream support	Yes
T2MI MPLP (multiple PLP) signa	Yes
CI Interface	
Number of Common Interfaces	8x (in total)
FlexCAM technology	Yes
Connectror	PCMCIA (front access)
Max. Frequency	77MHz
Transport Stream Processing	
Pool technology support	Yes
Services	User selection by service names or Service ID
Automatic regeneration	PAT, CAT, SDT, PMTs, EITs tables
NIT	Pass-through, custom, automatic
Custom NIT/SDT creation	Yes
PCR	Re-stamping
PCR correction	Yes
LCN support	Yes
PID filtering	Yes
EPG information	Yes over RF and IP

IP Streaming (OUT)	
IP TS Out	Yes
Protocol	UDP / RTP (Multicast/Unicast)
Speed	1 Gbit (800 Mbps in IP only mode)
Type	Up to 128 x SPTS or 16 x MPTS
SDP/SAP Support	Yes
IP Streaming (IN)	
Optional	Requires extra license
IP TS In	Yes
Protocol	UDP / RTP (Multicast/Unicast)
Speed	1 Gbit (800 Mbps)
Type	Up to 128 x SPTS or 16 x MPTS
IGMP snooping	Yes, v2 and v3
Programming Interface	
Operating system	Linux OS
Ethernet webserver	Yes, embedded webserver
Speed	100/1000 Mbps
Connector	RJ45
Browser compatibility	Chrome, Firefox, Safari, Opera, Edge et al.
EAN-13	
Code	5213009762427
General	
Power supply	230-240 VAC
Frequency range	50…60Hz
Number of power supplies	Up to two(2)
Hot-swap technology	Yes
Power supply consumption	~65VA
Operating temperature	0 °C to 40 °C
Storage temperature	-10 °C to +70 °C
Humidity	Up to 90%
Dimensions	480 x 295 x 43.5mm
Mounting	1U rack
Weight	4.55 Kg

PROLINE

PLC-300

16 x DVB-S/S2/T/T2/C + 8 x FlexCAM
to 16 x DVB-T/C & IP

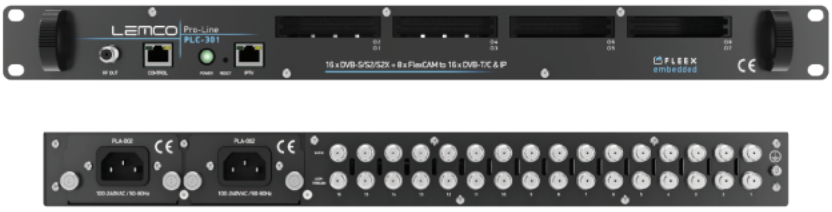
Input	
Type	16 x DVB-S/S2/T/T2/C
Frequencies	950…2150 MHz DVB-S/S2
	118…900MHz DVB-T/T2/C
Connector	75Ω - F, female
Loop-through connector	No
LNB	
Voltage	OFF / 13V / 18V
Current	Less than 400mA (per input)
22 kHz signal	ON / OFF
22 kHz signal - Voltage	0.65V ± 0.35V
22 kHz signal - Frequency	22 KHz ± 4Hz
22 kHz signal - DiSEqC	1.0 (Port A, B, C, D)
DVB-S (IN)	
Symbol rate	1 - 45 MBaud
Roll off factor	0.35
Code rate	1/2, 2/3, 3/4, 5/6, 7/8 (Automatic)
Spectral inversion	Reverse, Non-reverse (Automatic)
DVB-S2 (IN)	
Constellation	QPSK, 8PSK (Automatic)
Symbol rate	1 - 45 MBaud (QPSK) - 1 - 30 MBaud (8PSK)
Roll off factor	0.2 / 0.35 (Automatic)
Code rate	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 8/10 (QPSK-Automatic)
	3/5, 2/3, 3/4, 5/6, 8/9, 9/10 (8PSK-Automatic)
Spectral inversion	Reverse, Non-reverse (Automatic)
CI Interface	
Number of Common Interfaces	8x (in total)
Connectror	PCMCIA (front access)
Max. Frequency	77MHz
DVB-T (IN)	
Bandwidth	6, 7, 8 MHz
Mode	2K, 8K
Constellation	QPSK, 16QAM, 64QAM
Guard interval	1/4, 1/8, 1/16, 1/32
Code rate	1/2, 2/3, 3/4, 5/6, 7/8
DVB-T2 (IN)	
Bandwidth	5, 6, 7, 8 MHz
Mode	1K, 2K, 4K, 8K, 16K, 32K (Included extended mode)
Constellation	QPSK, 16QAM, 64QAM, 256QAM
Code rate	1/2, 3/5, 2/3, 3/4, 4/5, 5/6
Multi PLP support	Yes
DVB-C (Annex A,B,C)	
Bandwidth	5, 6, 7, 8 MHz
Mode	Automatic modulation detection
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Transport Stream Processing	
Pool technology support	Yes
Services	User selection by service names or Service ID
Automatic regeneration	PAT, CAT, SDT, PMTs, EITs tables
NIT	Pass-through, custom, automatic
Custom NIT/SDT creation	Yes
PCR	Re-stamping
PCR correction	Yes
LCN support	Yes
PID filtering	Yes
EPG information	Yes over RF and IP

RF Output	
Type	16 x DVB-T or 16 x DVB-C RF channels
	2 groups of 8 adjacent channels in DVB-T
	8 groups of 2 adjacent channels in DVB-C
Output Frequencies	110…900 MHz (10 KHz step)
Output Level	90dBµV
Connector	75Ω - F, female
Output Attenuator	0…-30dB
DVB-T (OUT)	
Bandwidth	5, 6, 7, 8 MHz
Mode	2K, 8K
Constellation	QPSK, 16QAM, 64QAM
Guard interval	1/4, 1/8, 1/16, 1/32
Code rate	1/2, 2/3, 3/4, 5/6, 7/8
MER	More than 42dB @ Full Band
DVB-C (OUT)	
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Symbol rate	2.5-8.4 Ms/s
Channel step	3…10MHz
MER	More than 40dB @ Full Band
IP Streaming (OUT)	
IP TS Out	Yes
Protocol	UDP / RTP (Multicast/Unicast)
Speed	1 Gbit (800 Mbps in IP only mode)
Type	Up to 128 x SPTS or 16 x MPTS
SDP/SAP Support	Yes
IP Streaming (IN)	
Optional	Requires extra license
IP TS In	Yes
Protocol	UDP / RTP (Multicast/Unicast)
Speed	1 Gbit (800 Mbps)
Type	Up to 112 x SPTS
IGMP snooping	Yes, v2 and v3
Programming Interface	
Operating system	Linux OS
Ethernet webserver	Yes, embedded webserver
Speed	100/1000 Mbps
Connector	RJ45
Browser compatibility	Chrome, Firefox, Safari, Opera, Edge et al.
EAN-13	
Code	5213009761888
General	
Power supply	230-240 VAC
Frequency range	50…60Hz
Number of power supplies	Up to two(2)
Hot-swap technology	Yes
Power supply consumption	~65VA
Operating temperature	0 °C to 40 °C
Storage temperature	-10 °C to +70 °C
Humidity	Up to 90%
Dimensions	480 x 295 x 43.5mm
Mounting	1U rack
Weight	4.65 Kg

PROLINE

PLC-301

16 x DVB-S/S2/S2X + 8 x FlexCAM to 16 x DVB-T/C & IP



Input	
Type	16 x DVB-S/S2/S2X
Frequencies	950…2150 MHz
Connector	75Ω - F, female
Loop-through connector	Yes
LNB	
Voltage	OFF / 13V / 18V
Current	Less than 400mA (per input)
22 kHz signal	ON / OFF
22 kHz signal - Voltage	0.65V ± 0.35V
22 kHz signal - Frequency	22 KHz ± 4Hz
22 kHz signal - DiSEqC	1.0 (Port A, B, C, D)
DVB-S (IN)	
Symbol rate	1 - 45 MBaud
Roll off factor	0.35
Code rate	1/2, 2/3, 3/4, 5/6, 7/8 (Automatic)
Spectral inversion	Reverse, Non-reverse (Automatic)
DVB-S2 (IN)	
Constellation	QPSK, 8PSK (Automatic)
Symbol rate	1 - 45 MBaud (QPSK) - 1 - 30 MBaud (8PSK)
Roll off factor	0.2 / 0.35 (Automatic)
Code rate	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 8/10 (QPSK-Automatic)
	3/5, 2/3, 3/4, 5/6, 8/9, 9/10 (8PSK-Automatic)
Spectral inversion	Reverse, Non-reverse (Automatic)
DVB-S2X (IN)	
Standard	EN302 307-1 V1.4.1
Constellation	QPSK, 8PSK (automatic)
Symbol rate	1 - 45 MBaud (QPSK) / 1 - 30 MBaud (8PSK)
Roll off factor	Anó 0.05 to 0.35 (automatic)
Code rate	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 8/10 (QPSK- automatic)
	3/5, 2/3, 3/4, 5/6, 8/9, 9/10 (8PSK- automatic)
Multi-stream support	Yes
T2MI MPLP (multiple PLP) signa	Yes
CI Interface	
Number of Common Interfaces	8x (in total)
Connectror	PCMCIA (front access)
Max. Frequency	77MHz
Transport Stream Processing	
Pool technology support	Yes
Services	User selection by service names or Service ID
Automatic regeneration	PAT, CAT, SDT, PMTs, EITs tables
NIT	Pass-through, custom, automatic
Custom NIT/SDT creation	Yes
PCR	Re-stamping
PCR correction	Yes
LCN support	Yes
PID filtering	Yes
EPG information	Yes over RF and IP

RF Output	
Type	16 x DVB-T or 16 x DVB-C RF channels
	2 groups of 8 adjacent channels in DVB-T
	8 groups of 2 adjacent channels in DVB-C
Output Frequencies	110…900 MHz (10 KHz step)
Output Level	90dBµV
Connector	75Ω - F, female
Output Attenuator	0…-30dB
DVB-T (OUT)	
Bandwidth	5, 6, 7, 8 MHz
Mode	2K, 8K
Constellation	QPSK, 16QAM, 64QAM
Guard interval	1/4, 1/8, 1/16, 1/32
Code rate	1/2, 2/3, 3/4, 5/6, 7/8
MER	More than 42dB @ Full Band
DVB-C (OUT)	
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Symbol rate	2.5-8.4 Ms/s
Channel step	3…10MHz
MER	More than 40dB @ Full Band
IP Streaming (OUT)	
IP TS Out	Yes
Protocol	UDP / RTP (Multicast/Unicast)
Speed	1 Gbit (800 Mbps in IP only mode)
Type	Up to 128 x SPTS or 16 x MPTS
SDP/SAP Support	Yes
IP Streaming (IN)	
Optional	Requires extra license
IP TS In	Yes
Protocol	UDP / RTP (Multicast/Unicast)
Speed	1 Gbit (800 Mbps)
Type	Up to 112 x SPTS
IGMP snooping	Yes, v2 and v3
Programming Interface	
Operating system	Linux OS
Ethernet webserver	Yes, embedded webserver
Speed	100/1000 Mbps
Connector	RJ45
Browser compatibility	Chrome, Firefox, Safari, Opera, Edge et al.
EAN-13	
Code	5213009761895
General	
Power supply	230-240 VAC
Frequency range	50…60Hz
Number of power supplies	Up to two(2)
Hot-swap technology	Yes
Power supply consumption	~65VA
Operating temperature	0 °C to 40 °C
Storage temperature	-10 °C to +70 °C
Humidity	Up to 90%
Dimensions	480 x 295 x 43.5mm
Mounting	1U rack
Weight	4.65 Kg

PROLINE

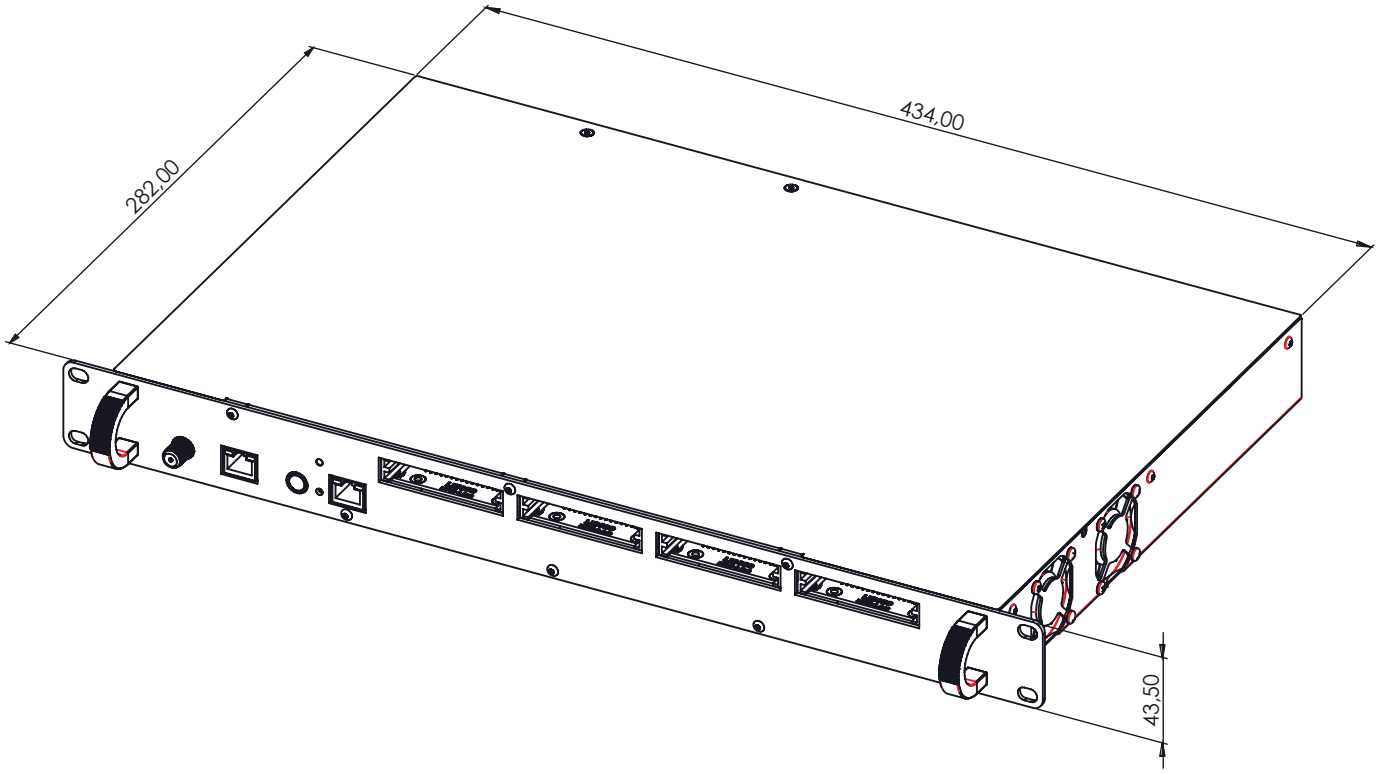
PLC-302

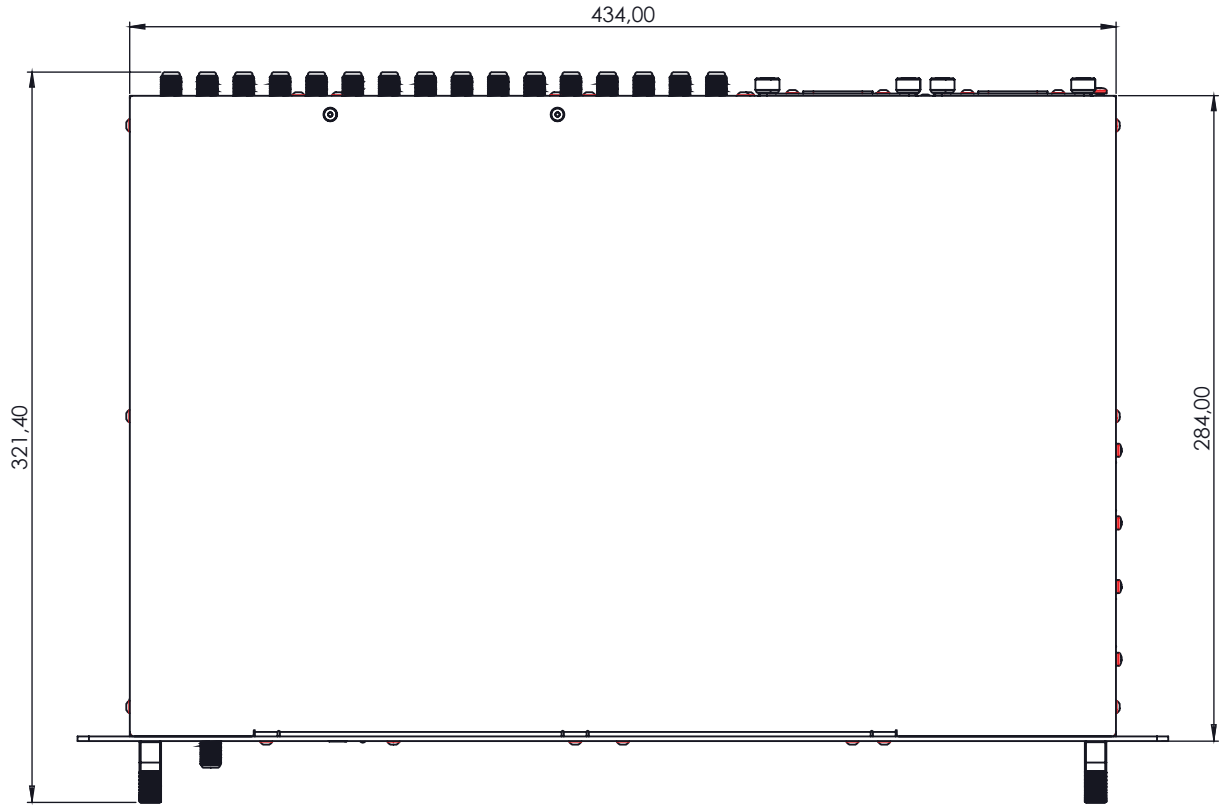
8 × DVB-S/S2/T/T2/C + 8 × DVB-S/S2/S2X + 8 x CI to 16 x DVB-T/C & IP

Input	
Type	8 × DVB-S/S2/T/T2/C + 8 × DVB-S/S2/S2X
Frequencies	950…2150 MHz
Connector	75Ω - F, female
Loop-through connector	Yes
LNB	
Voltage	OFF / 13V / 18V
Current	Less than 400mA (per input)
22 kHz signal	ON / OFF
22 kHz signal - Voltage	0.65V ± 0.35V
22 kHz signal - Frequency	22 KHz ± 4Hz
22 kHz signal - DiSEqC	1.0 (Port A, B, C, D)
DVB-S (IN)	
Symbol rate	1 - 45 MBaud
Roll off factor	0.35
Code rate	1/2, 2/3, 3/4, 5/6, 7/8 (Automatic)
Spectral inversion	Reverse, Non-reverse (Automatic)
DVB-S2 (IN)	
Constellation	QPSK, 8PSK (Automatic)
Symbol rate	1 - 45 MBaud (QPSK) - 1 - 30 MBaud (8PSK)
Roll off factor	0.2 / 0.35 (Automatic)
Code rate	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 8/10 (QPSK-Automatic)
	3/5, 2/3, 3/4, 5/6, 8/9, 9/10 (8PSK-Automatic)
Spectral inversion	Reverse, Non-reverse (Automatic)
DVB-S2X (IN)	
Standard	EN302 307-1 V1.4.1
Constellation	QPSK, 8PSK (automatic)
Symbol rate	1 - 45 MBaud (QPSK) / 1 - 30 MBaud (8PSK)
Roll off factor	Anó 0.05 to 0.35 (automatic)
Code rate	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 8/10 (QPSK- automatic)
	3/5, 2/3, 3/4, 5/6, 8/9, 9/10 (8PSK- automatic)
Multi-stream support	Yes
T2MI MPLP (multiple PLP) signa	Yes
CI Interface	
Number of Common Interfaces	8x (in total)
FlexCAM technology	Yes
Connectror	PCMCIA (front access)
Max. Frequency	77MHz
Transport Stream Processing	
Pool technology support	Yes
Services	User selection by service names or Service ID
Automatic regeneration	PAT, CAT, SDT, PMTs, EITs tables
NIT	Pass-through, custom, automatic
Custom NIT/SDT creation	Yes
PCR	Re-stamping
PCR correction	Yes
LCN support	Yes
PID filtering	Yes
EPG information	Yes over RF and IP

RF Output	
Type	16 x DVB-T or 16 x DVB-C RF channels
	2 groups of 8 adjacent channels in DVB-T
	8 groups of 2 adjacent channels in DVB-C
Output Frequencies	110…900 MHz (10 KHz step)
Output Level	90dBµV
Connector	75Ω - F, female
Output Attenuator	0…-30dB
DVB-T (OUT)	
Bandwidth	5, 6, 7, 8 MHz
Mode	2K, 8K
Constellation	QPSK, 16QAM, 64QAM
Guard interval	1/4, 1/8, 1/16, 1/32
Code rate	1/2, 2/3, 3/4, 5/6, 7/8
MER	More than 42dB @ Full Band
DVB-C (OUT)	
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Symbol rate	2.5-8.4 Ms/s
Channel step	3…10MHz
MER	More than 40dB @ Full Band
IP Streaming (OUT)	
IP TS Out	Yes
Protocol	UDP / RTP (Multicast/Unicast)
Speed	1 Gbit (800 Mbps in IP only mode)
Type	Up to 128 x SPTS or 16 x MPTS
SDP/SAP Support	Yes
IP Streaming (IN)	
Optional	Requires extra license
IP TS In	Yes
Protocol	UDP / RTP (Multicast/Unicast)
Speed	1 Gbit (800 Mbps)
Type	Up to 128 x SPTS or 16 x MPTS
IGMP snooping	Yes, v2 and v3
Programming Interface	
Operating system	Linux OS
Ethernet webserver	Yes, embedded webserver
Speed	100/1000 Mbps
Connector	RJ45
Browser compatibility	Chrome, Firefox, Safari, Opera, Edge et al.
EAN-13	
Code	5213009762434
General	
Power supply	230-240 VAC
Frequency range	50…60Hz
Number of power supplies	Up to two(2)
Hot-swap technology	Yes
Power supply consumption	~65VA
Operating temperature	0 °C to 40 °C
Storage temperature	-10 °C to +70 °C
Humidity	Up to 90%
Dimensions	480 x 295 x 43.5mm
Mounting	1U rack
Weight	4.65 Kg

6. DIMENSIONS





7. LEMCO LIMITED WARRANTY

This device is subject to Lemco Warranty Terms & Conditions that can be downloaded from Lemco's website www.lemco.gr

8. WARNINGS

Content warning

This document contains preliminary information about a product of Lemco company. Lemco reserves the right to make any changes or modifications at any time without prior notice.

9. NOTES

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