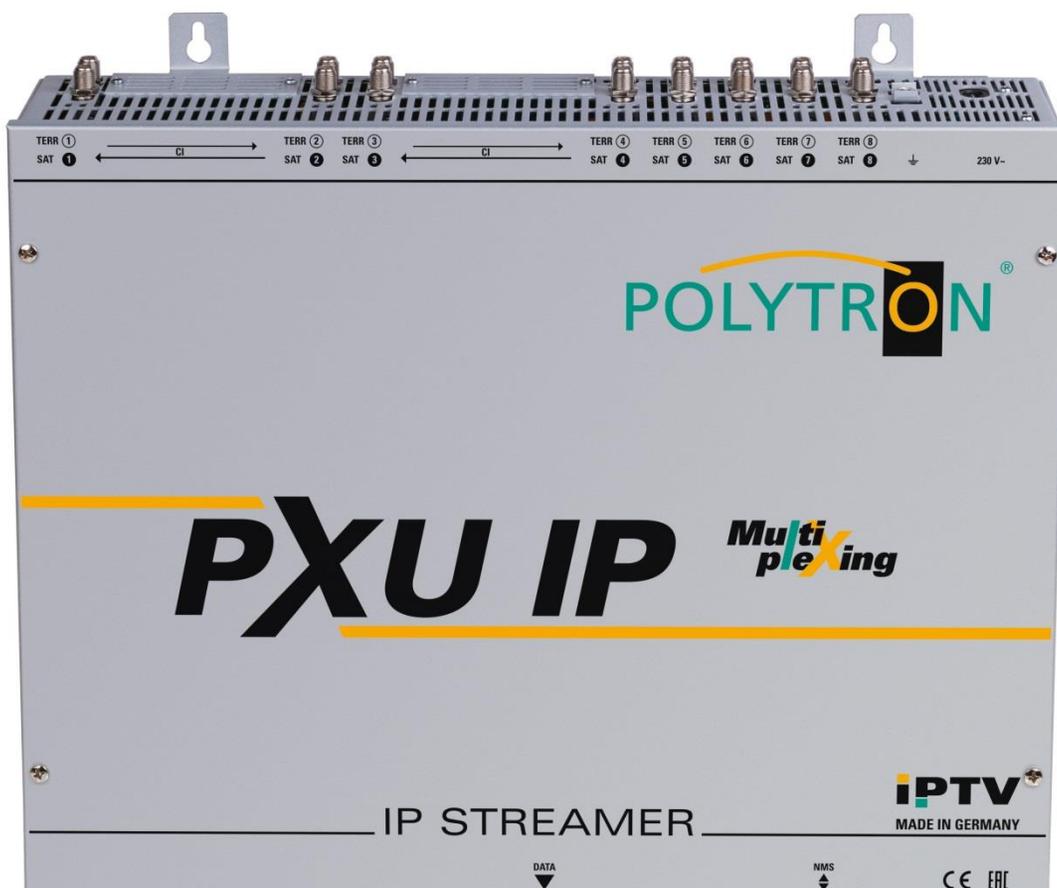


PXU 848 IP

IP-Streamer with multiplexing



User manual

CE EAC

MADE IN GERMANY

0902481 V1

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1. Mounting- and safety instructions

Please observe the following safety instructions in order to prevent any risks for persons and/or damage to the device, as well as to contribute to environmental protection.

Important instructions

Please read the operating instructions for the device(s) carefully before putting into operation! The instructions contain important information on installation, environmental conditions, service and maintenance. Save the operating instructions for later use. All operating instructions can be found on our website at: <https://polytron.de/index.php/en/services/operating-manuals>

Approved use



Use the device only at the permissible operating locations, under the permissible environmental conditions and for the purpose described in the operating instructions. If there is no information about the intended use (e.g. operating location, environmental conditions) or if the operating instructions do not contain any relevant information, you must contact the manufacturer of this device to ensure that the device can be installed. If you do not receive any information from the manufacturer, the device must not be put into operation.

Transport



Please check the packaging and the device for damages in shipment immediately upon receipt. Do not put a damaged device into operation.

Transporting the device by the power cord is not permitted as this can damage the power cord or the strain relief. Insulation that serves to protect against mains voltages can be damaged by excessive loads (e.g. fall, shock, vibration).

Attention



The rated voltage on the device must correspond with the mains voltage to be used. When operating devices with protection class I, connection to power sockets with a protective conductor connection is mandatory. The instructions for operating the device must be observed.

Grounding and potential equalisation



Please establish grounding and perform potential equalisation before initial startup. According to the currently valid version of EN 60728-11, coaxial receiving and distribution systems must meet the safety requirements with regard to earthing, equipotential bonding etc, even if the device is removed. Otherwise, damage to the product, fire, or other dangers can occur. In addition, the earth connection on the device can be used. Other devices within touching distance are to be integrated in the equipotential bonding. Operation without a protective conductor connection, device grounding or equipotential bonding is not permitted. If damaged, the device must be taken out of operation.

The electrical system for powering the device, e.g. house installations must contain protective devices against excessive currents, earth faults and short circuits. Follow all applicable national safety regulations and standards.



Connection cables

Always install the connection cables with a loop so that condensed and/or splashing water cannot run into the device.

Select installations site



Plan the installation location so that children cannot play with the device and its connections. The device should only be installed on a solid, flat and most of all fire-resistant surface. Observe the operation position of the devices specified in the operating instructions. Avoid strong magnetic fields in the surroundings. Too strong a heat effect or accumulation of heat will have an adverse effect on the durability. Don't mount directly over or near heating systems, open fire sources or the like, where the device is exposed to heat radiation or oil vapours. Mount fan-cooled and passively cooled devices so that the air can be sucked in unhindered through the lower ventilation slots and heat can escape through the upper ventilations slots. Ensure free air circulation, ventilation slots must not be covered. Do not place any objects on the devices. Installation in recesses, alcoves etc and covering the installation site, e.g. through curtains is not allowed. To avoid heat build-up, the correct installation position must be observed and all-round, free ventilation must be ensured in accordance with the information in the operating instructions! When installing the cabinet, sufficient air convection must be possible to ensure that the maximum permissible ambient temperature of the device is maintained.



Moisture

The devices have no protection against water and may therefore only be operated and connected in dry rooms.

Dripping/splashing water and high humidity damage the device. If there is condensation, wait until the device is completely dry. Select the operating environment according to the specified IP protection class.



Heat

Housing parts near cooling fins and cooling fins themselves can get very hot. Therefore, you should not touch these parts.

Mounting and service work



The device may only be installed and operated by qualified persons (in accordance with EN 62368-1) or by persons who have been instructed by experts in accordance with the rules of technology. Maintenance work may only be carried out by qualified service personnel. Before starting the service work, switch off the operating voltage and secure it against being switched on again. In the event of service or danger, the mains plug serves as a disconnect device from the mains voltage and must therefore be accessible and usable at all times. In order to guarantee interference immunity, all device covers must be screwed tight again after opening.

Fuses are only to be changed by authorised specialists. Only fuses of the same type may be used.

Repairs



Repairs may only be carried out by the manufacturer. Improper repairs can pose significant risks to the user. In the event of malfunctions, the device must be disconnected from the mains and authorised specialist personnel must be consulted. If necessary, the device must be sent to the manufacturer.

Thunderstorm



According to EN 60728 part 1 safety requirements, due to increased risk of lightning, maintenance and / or installation work should not be carried out during thunderstorms on the device or the system.

High overvoltages (lightning strikes, overvoltages in the power grid) can damage insulation that serves to protect against mains voltage.

Ambient temperature



The permissible ambient temperatures specified in the technical data must be observed for operation and storage, even if the climatic conditions change due to external influences (solar radiation etc.). Overheating the device can damage the insulation that serves to isolate the mains voltage.

Termination



Unused coaxial connections should be terminated with 75 Ohm terminating resistors. For DC-supplied connections, DC voltage decoupling must be used or use 75 Ohm terminating resistors with integrated DC decoupling.

Attention

This module contains ESD components! (ESD = Electrostatic Sensitive Device).

An electrostatic discharge is an electrical current pulse, which can flow through an electrically insulated material, when triggered by a large voltage difference. To ensure the reliability of ESD components, it is necessary to consider their most important handling rules:



- » Pay attention permanently to potential equalisation (equipotential bonding)!
- » Use wrist straps and approved footwear for personnel grounding!
- » Avoid electrostatically chargeable materials such as normal PE, PVC, polystyrene!
- » Avoid electrostatic fields >100 V/cm!
- » Use only labeled and defined packing and transportation materials!

Damage caused by faulty connections and/or improper handling are excluded from any liability.

Recycling



All of our packaging materials (packaging, identification sheets, plastic foil and bags) are fully recyclable. The devices are to be disposed of properly according to the current disposal regulations of your district/country/state as electronic scrap.



WEEE-Reg.-Nr. DE 51035844

Guarantee conditions



The general terms and conditions of Polytron-Vertrieb GmbH apply. The general terms and conditions can be found on our website at: <https://polytron.de/index.php/en/company/general-terms-and-conditions>

GENERAL INFORMATION ON THE OPERATING INSTRUCTIONS

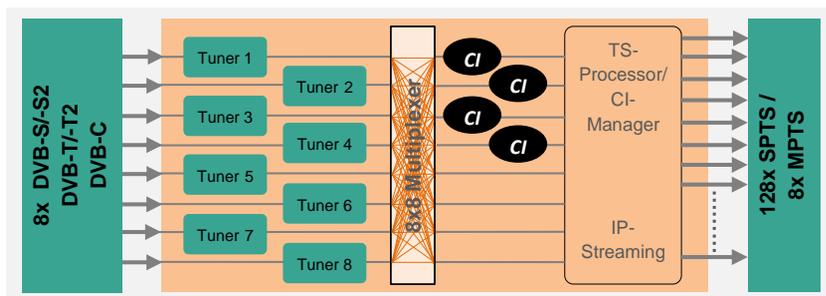
- All parameter data are examples only.
- User adjustable parameters are freely selectable.
- Menu views can vary slightly depending on the software version; the operability does not change as a result.
- The images in this manual are for illustrative purposes only.

2. General information

The transmission of television programs via digital data networks (IPTV) is becoming increasingly important. Using of the so-called Internet protocol, it is also possible to transmit DVB signals via a network infrastructure. The ability to use IP networks as transmission paths for television programs, the DVB signals received in the PXU 848 IP are converted into IP streams and thus made available throughout the network. The PXU 848 IP enables the combined processing of encrypted and open channels. The integrated multiplexing function allows the generation of new output channels with contents of the 8 different input transponders and thus the capacities of the smart cards can be optimally utilized. Particularly in office buildings and hospitals, the supply of terminal equipment via IP networks, some of which already exist, represents an elegant solution for the transmission of television programs. For new buildings and special applications, such as cruise ships, the advantage is that only an IP network has to be set up and additional coaxial cabling is not required.

3. Description

The IP streamer PXU 848 IP converts the content of eight SAT transponders, terrestrial or cable channels into IP-streams. The reception mode can be selected individually at each of the eight inputs: DVB-S/S2, DVB-T/T2 or DVB-C. Four of the eight channel strips are each provided with a CI interface for decoding encrypted signals. The integrated multiplexing function allows the generation of new output channels with content of the different input transponders. For this, the contents of various transponders can be decrypted via one smartcard and thus the capacities of the smartcards can be optimally utilized. The input signal is made available throughout the IP network and can be directly received by PCs / notebooks with appropriate software, IP-compatible TV sets or set-top boxes (STBs) that support the "DVB-IPTV" standard. The IP Streamer can be quickly and easily programmed via the web browser user interface. The selected settings can be printed out, saved and transferred to other devices, e.g. via USB stick. The integrated LAN connection allows remote control of all parameters. The supply voltages can be activated separately for the SAT and terrestrial inputs with jumpers.

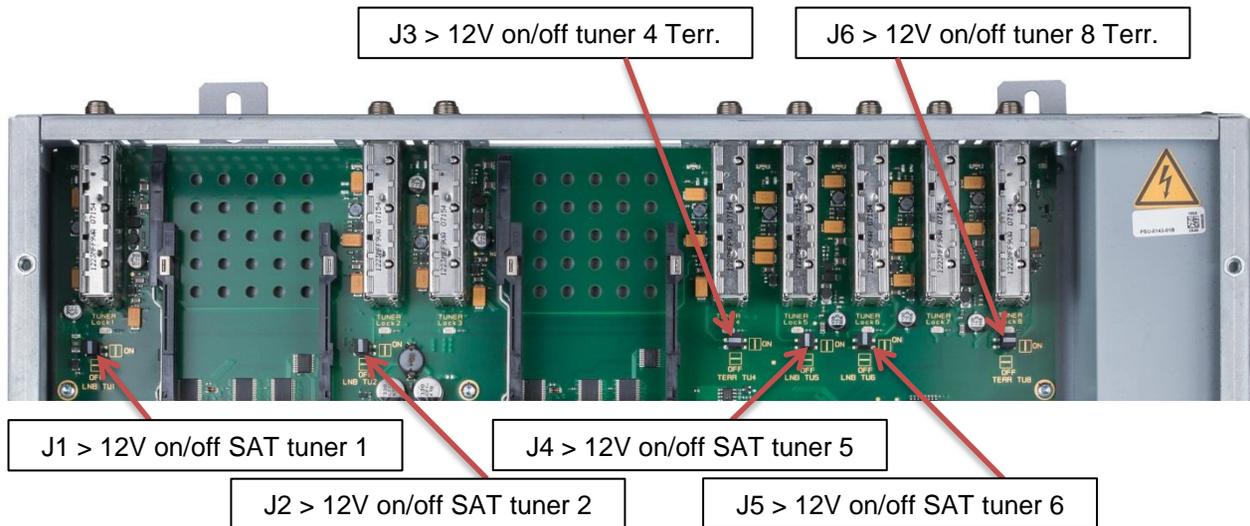


4. Scope of delivery

- 1 x PXU 848 IP
- 1 x Power cable
- 1 x LAN patch cable
- 1 x User manual
- 1 x Mounting accessories

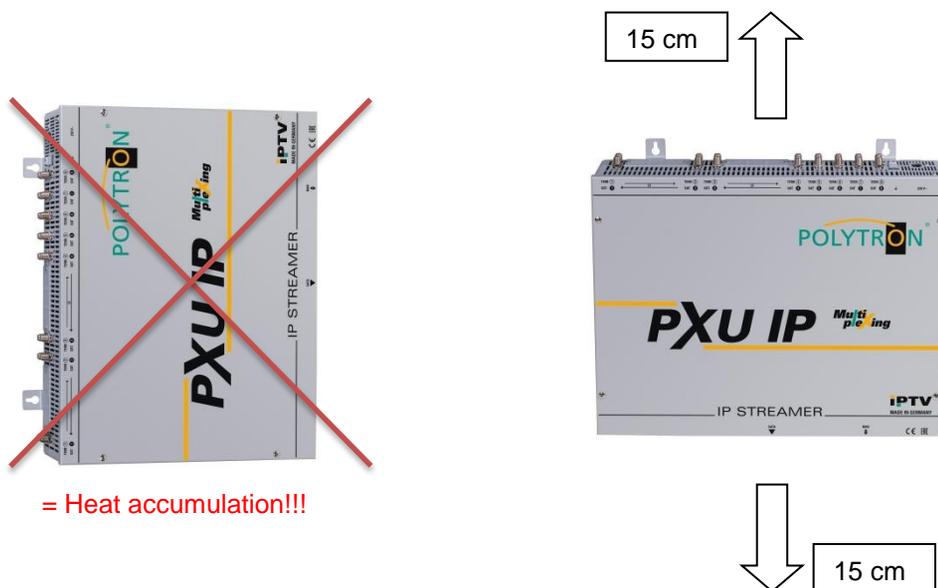
5. Input circuit

In the PXU 848 IP, signals are directly fed to the input tuners. Due to the triple tuners, there are eight inputs each for SAT and eight for terrestrial signals (DVB-T/T2 or DVB-C). In the 'factory settings' condition, there is a 12 VDC voltage for LNB supply on SAT input tuners 1, 2, 5 and 6. This can be switched by corresponding jumpers J1, J2, J4 and J5. On tuners 4 and 8, a 12 V supply voltage for the terrestrial range can be activated by inserting the corresponding jumpers J3 and J6. The operating states are indicated by external LEDs.



6. Mounting

The IP Streamer must be installed in a well-ventilated room. The ambient temperature must not exceed 45 °C. It must be ensured that air can circulate freely through the ventilation holes, this applies especially with horizontal 19" mounting. In order to free air circulation, a minimum distance of at least 15 cm from the ventilation holes is required. The mains plug must be pulled out for installation or when working on the wiring.



6.1 Grounding

The device must be grounded according to EN 60728-11.

- Strip approximately 15 mm of the cable insulation of the grounding cable (4mm²).
- Slide the stripped end under the earth screw and tighten the screw.



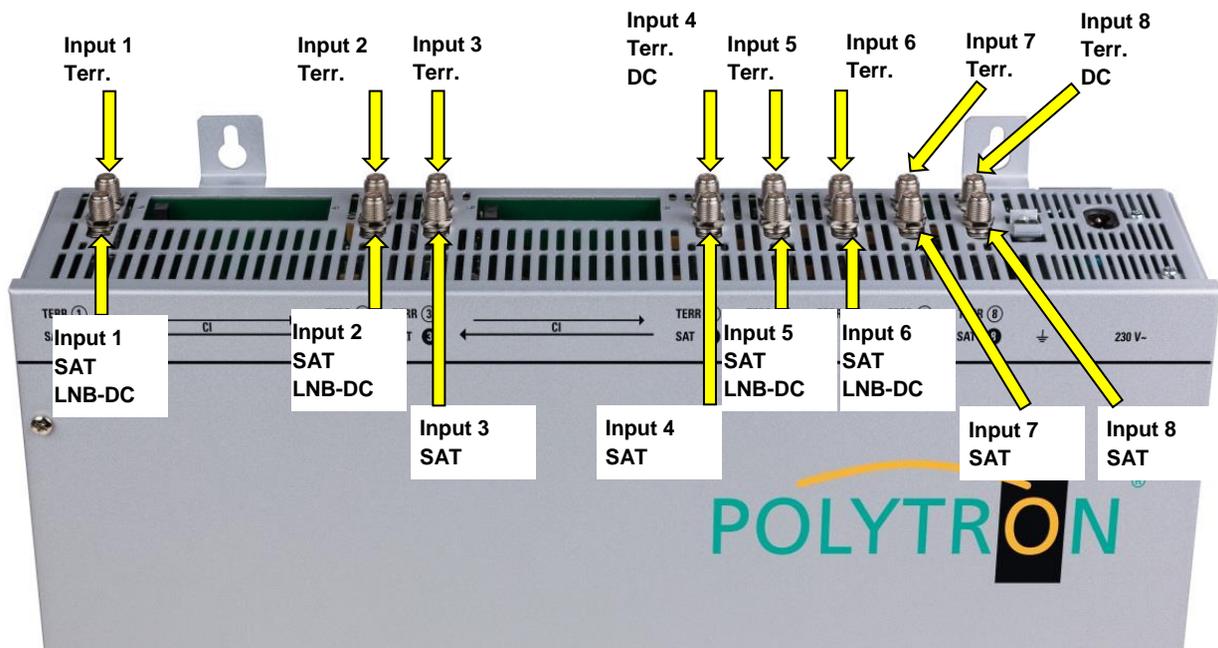
7. Installation

Connection of the input signals

Connect the SAT signals directly or via splitter(s) to the SAT tuner inputs. At SAT input tuners 1, 2, 5 and 6, a 12 V DC voltage is applied for LNB supply. DVB-T and DVB-C are connected via the terrestrial input. A 12 V supply is optionally available at the terrestrial input tuners 4 and 8.

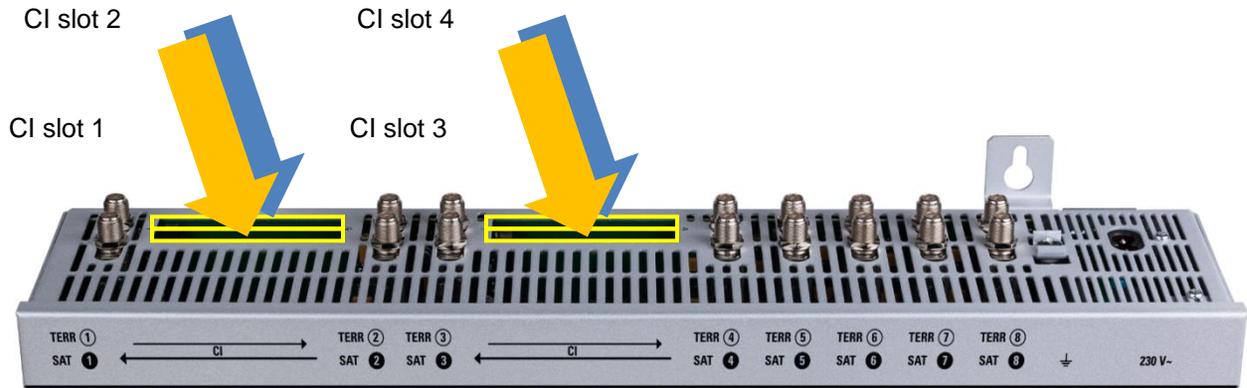


Please note the current consumption of each input may not exceed 250 mA. A total of 500 mA is available.



Insertion of the CI modules

To insert the CI modules, the covers must be removed. The picture shows the assignment of the CI slots to the inputs. For wall mounting as shown in the picture, the double ridge guide of the CAMs must always be on the left side. On the right side, the CAM has only a single ridge guide.



7.1 Pre-programming

The inputs and outputs of the device have factory presets with a standard frequency assignment. To receive the pre-programmed ASTRA transponders, the SAT inputs must be connected to the "Horizontal High" level.

Slot 1-4:

SAT Input	1	2	3	4
Transponder	71	77	107	89
Frequency	ARD Digital HH 11836	ZDF Vision HH 11954	SAT.1/Pro Sieben HH 12545	RTL World HH 12188
Symbol rate	27500 kSym	27500 kSym	22000 kSym	27500 kSym
ASTRA	Das Erste BR FS Süd hr-fernsehen	ZDF 3sat KIKA	SAT.1 ProSieben kabel eins	RTL Television RTL2 VOX
IP Output MPTS	deaktiviert			
IP address	239.1.1.1	239.1.1.2	239.1.1.3	239.1.1.4
Port	10001	10002	10003	10004
Protocol	RTP	RTP	RTP	RTP

Slot 5-8:

SAT Input	5	6	7	8
Transponder	85	91	103	93
Frequency	ARD Digital Dritte HH 12110	Diverse HH 12226	Diverse HH 12460	ARD digital Radio HH 12266
Symbol rate	27500 kSym	27500 kSym	27500 kSym	27500 kSym
ASTRA	RBB Berlin NDR NDS MDR TH	Eurosport HSE 24 EuroNews D	Disney Channel N24 Doku Sixx	SR Fernsehen ARD Alpha N-Joy
IP Output MPTS	deaktiviert			
IP address	239.1.1.5	239.1.1.6	239.1.1.7	239.1.1.8
Port	10005	10006	10007	10008
Protocol	RTP	RTP	RTP	RTP

IP parameters of the factory pre-programmed TV channels:

Service Name	SID	IP-Address	Port	CH No	Protocol	IP-Out	IN
Das Erste	28106	239.1.1.100	10001		RTP	<input checked="" type="checkbox"/>	1
BR Fernsehen Süd	28107	239.1.1.101	10001		RTP	<input checked="" type="checkbox"/>	1
hr-fernsehen	28108	239.1.1.102	10001		RTP	<input checked="" type="checkbox"/>	1
ZDF	28006	239.1.1.103	10001		RTP	<input checked="" type="checkbox"/>	2
3sat	28007	239.1.1.104	10001		RTP	<input checked="" type="checkbox"/>	2
KiKa	28008	239.1.1.105	10001		RTP	<input checked="" type="checkbox"/>	2
SAT.1	17500	239.1.1.106	10001		RTP	<input checked="" type="checkbox"/>	3
ProSieben	17501	239.1.1.107	10001		RTP	<input checked="" type="checkbox"/>	3
kabel eins	17502	239.1.1.108	10001		RTP	<input checked="" type="checkbox"/>	3
RTL Television	12003	239.1.1.109	10001		RTP	<input checked="" type="checkbox"/>	4
RTL2	12020	239.1.1.110	10001		RTP	<input checked="" type="checkbox"/>	4
VOX	12060	239.1.1.111	10001		RTP	<input checked="" type="checkbox"/>	4
RBB Berlin	28205	239.1.1.112	10001		RTP	<input checked="" type="checkbox"/>	5
NDR Niedersachsen	28226	239.1.1.113	10001		RTP	<input checked="" type="checkbox"/>	5
MDR Thüringen	28230	239.1.1.114	10001		RTP	<input checked="" type="checkbox"/>	5
Eurosport	31200	239.1.1.115	10001		RTP	<input checked="" type="checkbox"/>	6
HSE 24	31210	239.1.1.116	10001		RTP	<input checked="" type="checkbox"/>	6
EuroNews D	31230	239.1.1.117	10001		RTP	<input checked="" type="checkbox"/>	6
Disney Channel D	1793	239.1.1.118	10001		RTP	<input checked="" type="checkbox"/>	7
N24 Doku	48	239.1.1.119	10001		RTP	<input checked="" type="checkbox"/>	7
Sixx D	776	239.1.1.120	10001		RTP	<input checked="" type="checkbox"/>	7
SR Fernsehen	28486	239.1.1.121	10001		RTP	<input checked="" type="checkbox"/>	8
ARD Alpha	28487	239.1.1.122	10001		RTP	<input checked="" type="checkbox"/>	8
N-Joy	28440	239.1.1.123	10001		RTP	<input checked="" type="checkbox"/>	8

7.2 Input level

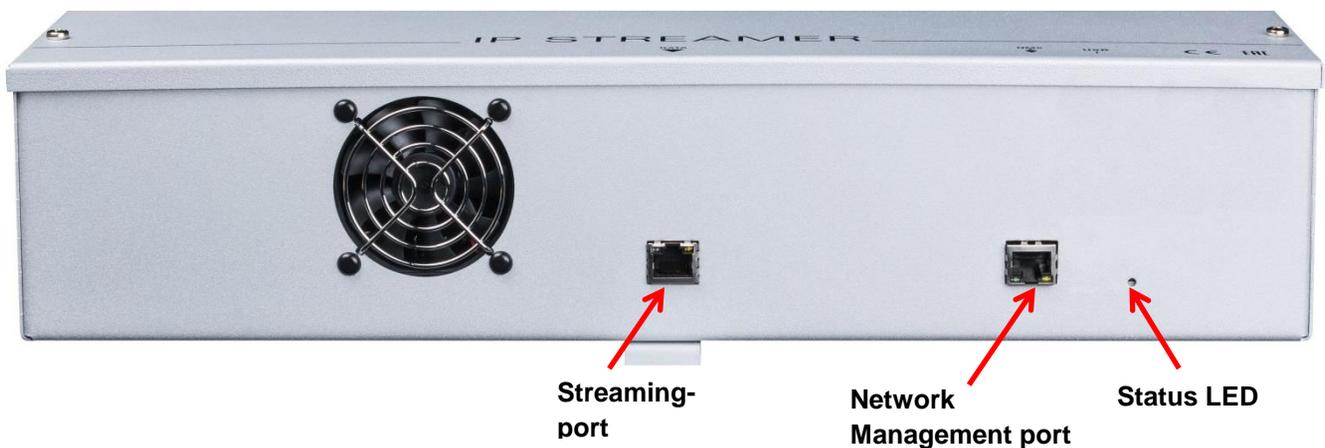
To ensure perfect reception, make sure that the level at the inputs is between **50 and 80 dBµV**.



When receiving digital signals, it is advantageous to have a lower input level rather than an excessively high one.

If the input level is too high, an attenuator must be used.

7.3 LAN connectors and status LED



8. General programming

After connection, the device runs through an internal routine and all channels are set up according to the previously stored data. During this time, the **Status LED** flashes green. A connection between the PXU 848 IP and the PC/notebook is only possible after the **Status LED** permanently lights up green or orange.

8.1 Initial setup

The PXU 848 IP is configured via the Network Management System (NMS).

8.1.1 Establishing a connection via the browser

Connect the PC or notebook directly to the network management port using a suitable CATx LAN cable. The input window appearance depends on the selected browser (Chrome, Firefox, Internet Explorer, etc.).

Notes:

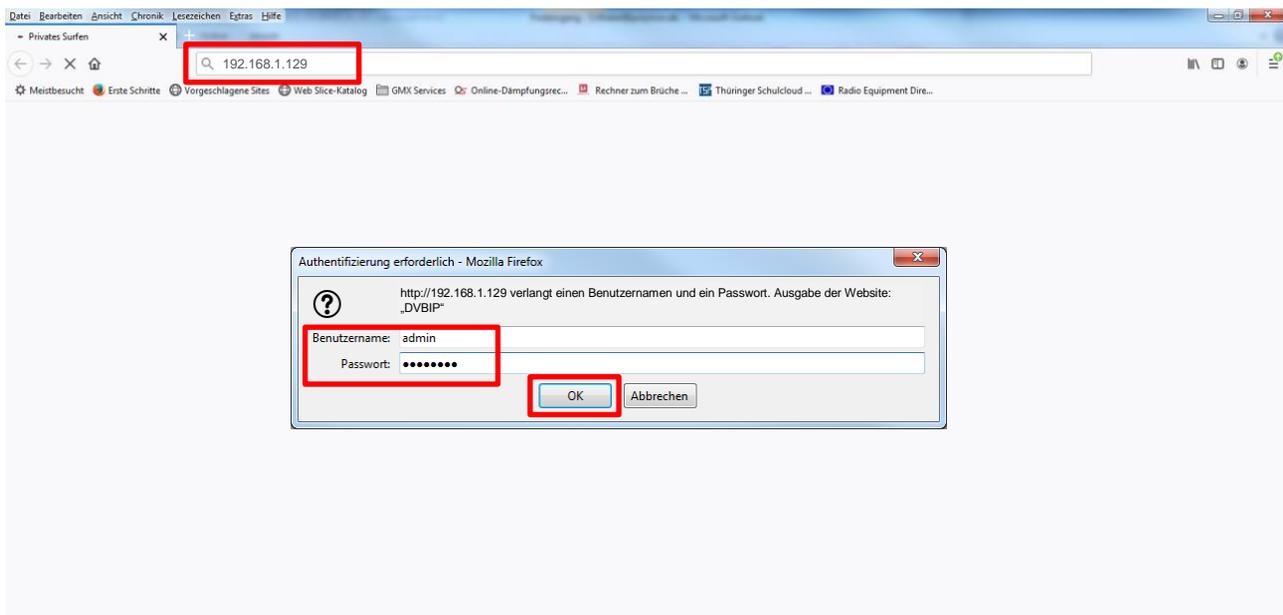
- PC / notebook and the IP streamer must be in the same network / IP address range.
- Cookies must be accepted and JavaScript must be enabled.
- Use current browser versions.

Enter the following IP address in the search bar of the web browser: **192.168.1.129**

Username: **admin**

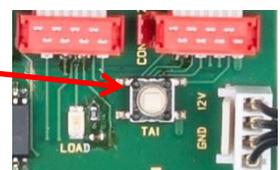
Password: **password**

Then click **OK** to establish the connection.



If the IP address of the IP streamer is lost or forgotten, it can be reset to the factory setting (192.168.1.129) as following:

- Disconnect the mains plug.
- Press and hold button TA1 on the IP board.
- Reconnect the mains plug.
- Wait until the status LED flashes red / green alternately.
- Now the IP address is reset and the button can be released.



8.2 Programming of the device parameters

After successful network access, the following overview window is displayed:

Device-Type	Serial-No	HW-Version	µC-Version	IP-Version	CI-ASI-Version	MUX-Version	Total Data Rate
PXU 848 IP	1003	1.00	1.06T2	1.02	2.11	1.01	122473 kBit/s

Channel	TP (MHz)	SR (kSym)	IP-Address	Port	Protocol
CHANNEL 1	11758	27500	239.1.1.1	10001	RTP
CHANNEL 2	11954	27500	239.1.1.2	10002	RTP
CHANNEL 3	12545	22000	239.1.1.3	10003	RTP
CHANNEL 4	12188	27500	239.1.1.4	10004	RTP
CHANNEL 5	12110	27500	239.1.1.5	10005	RTP
CHANNEL 6	12226	27500	239.1.1.6	10006	RTP
CHANNEL 7	12460	27500	239.1.1.7	10007	RTP
CHANNEL 8	11914	27500	239.1.1.8	10008	RTP

Via this menu, all settings of the input and output parameters can be done. The status display is automatically updated every 3 seconds.

The upper part of the menu shows the device data such as type, serial number, hardware version and the software versions for CPU, IP-, CI-ASI controller und MUX. The information about the total data rate is also displayed here.

The channel related setting and selection options for MPTS, IP address, port and protocol are displayed in the lower part of the menu.

Call up this overview menu via the menu item **Menu * Input & MPTS Settings**.

8.2.1 Input parameters for SAT reception

DVB > Input signal

INPUT: Tuner Locked
 BER: 1.0e-7
 SNR: 17 dB
 DVB: S/S2
 TP: 11836 MHz
 LO: AUTO
 SR: 27500 kSym
 Search Service List

Choose the kind of signal
 -> If DVB-T/T2 or DVB-C selected, please skip to section 8.2.2 Input parameters for the terrestrial range

TP > Transponder frequency

INPUT: Tuner Locked
 BER: 1.0e-7
 SNR: 17 dB
 DVB: S/S2
 TP: 11836 MHz
 LO: AUTO
 SR: 27500 kSym
 Search Service List

Enter transponder frequency

Auto > LO frequency

INPUT: Tuner Locked
 BER: 1.0e-7
 SNR: 17 dB
 DVB: S/S2
 TP: 11836 MHz
 LO: AUTO
 SR: 27500 kSym
 Search Service List

The required frequency is set automatically, but can be set to **09750**, **10600** or another **OTHER** frequency.

SR > Symbol rate

INPUT: Tuner Locked
 BER: 1.0e-7
 SNR: 17 dB
 DVB: S/S2
 TP: 11836 MHz
 LO: AUTO
 SR: 27500 kSym
 Search Service List

Enter symbol rate

Search > Scan

INPUT: Tuner Locked
 BER: 1.0e-7
 SNR: 17 dB
 DVB: S/S2
 TP: 11836 MHz
 LO: AUTO
 SR: 27500 kSym
 Search Service List

After pressing the **Search** button, the data is accepted and the desired transponder is set.

Tuner Locked

INPUT: Tuner Locked
 BER: 1.0e-7
 SNR: 17 dB
 DVB: S/S2
 TP: 11836 MHz
 LO: AUTO
 SR: 27500 kSym
 Search Service List

If the tuner locks on the transponder, **Tuner Locked** is displayed in the upper field.

Reception conditions (DVB-S/S2)

INPUT: Tuner Locked
 BER: 1.0e-7
 SNR: 17 dB
 DVB: S/S2
 TP: 11836 MHz
 LO: AUTO
 SR: 27500 kSym
 Search Service List

The quality of the input signal can be evaluated by using the bit error rate **BER** and the signal-to-noise ratio **SNR**.

These depend on the quality of the reception conditions and the SAT signals.

Recommendation: Bit error rate **BER** should be $\leq 1e-6$.

The table below shows required signal-to-noise ratio levels for varying FEC (forward error correction). The corresponding values of the FEC (forward error correction) have to be taken

from the tables of the satellite operators. If e.g. the transponder has an FEC of 5/6, the **SNR** display must be at least 9 dB to guarantee good signals.

FEC	good	best
1/2	5-7dB	8-11dB
2/3	7-9dB	10-13dB
3/4	8-10dB	11-14dB
5/6	9-11dB	12-15dB
7/8	10-12dB	13-16dB

8.2.2 Input parameters for the terrestrial range

TP > Frequency

INPUT: Tuner Locked
 DVB T2
 BER: 1.0e-7
 SNR: 36
 DVB: T/T2/C
 TP: 570.00 MHz
 BW: 8 MHz
 PLP: 0
 Search Service List

The kind of input signal will be defined automatically.

Enter input frequency

BW > Channel bandwidth

INPUT: Tuner Locked
 DVB T2
 BER: 1.0e-7
 SNR: 36
 DVB: T/T2/C
 TP: 570.00 MHz
 BW: 8 MHz
 PLP: 0
 Search Service List

Select 7 or 8 MHz

PLP > Select service DVB-T2

INPUT: Tuner Locked
 DVB T2
 BER: 1.0e-7
 SNR: 36
 DVB: T/T2/C
 TP: 570.00 MHz
 BW: 8 MHz
 PLP: 0
 Search Service List

Select PLP value
 (only for DVB-T2)

Search > Searching

INPUT: Tuner Locked
 DVB T2
 BER: 1.0e-7
 SNR: 36
 DVB: T/T2/C
 TP: 570.00 MHz
 BW: 8 MHz
 PLP: 0
 Search Service List

After pressing button **Search** the data is accepted
 And the desired channel is set.

If the tuner locks on the transponder, **Tuner Locked** is displayed in the upper field.

Reception conditions (DVB-T/T2/C)

INPUT: Tuner Locked
 DVB T2
 BER: 1.0e-7
 SNR: 36
 DVB: T/T2/C
 TP: 570.00 MHz
 BW: 8 MHz
 PLP: 0
 Search Service List

The quality of the input signal can be evaluated by using the bit error rate **BER** and the signal-to-noise ratio **SNR**.

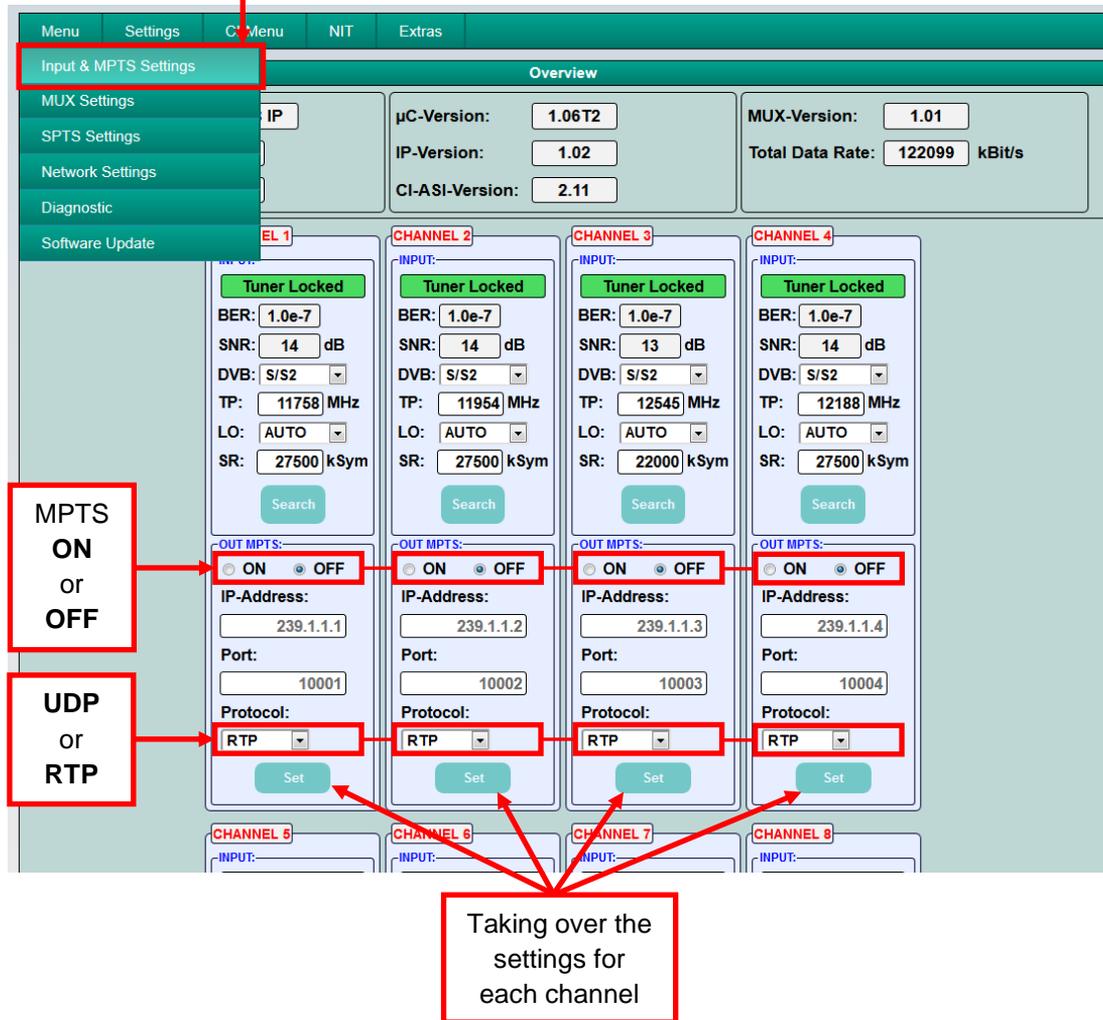
These depend on the quality of the reception conditions and the signals.

Recommendation: Bit error rate **BER** should be $\leq 1e-6$.

Required threshold value for the signal-to-noise ratio **SNR is 26 dB for DVB-T and 32 dB for DVB-T2.**

8.2.3 Output parameters MPTS (Multiple Program Transport Streams)

→ Click on **Menu * Input & MPTS Settings**



MPTS can be switched on or off separately for each channel strip → Factory setting: Off

MPTS and SPTS can switch on and off independently and operated in parallel. At factory default SPTS streams are active (see section 8.2.5).

The network protocol can also be selected separately for each channel strip → Factory setting: RTP

For further information on IP address and port, see section 7.1 (Input presetting).

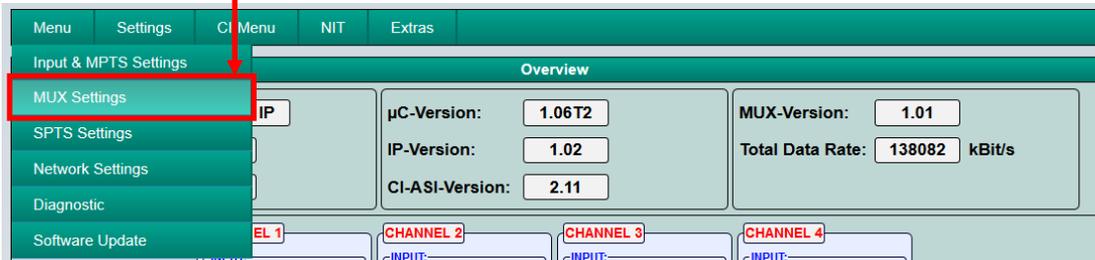
Clicking on **Set** confirms the settings for each channel strip.

Note: In MPTS mode, the EPG function (EIT insertion) is permanently switched on by default and can't be deactivated. It must be ensured that sufficient bandwidth is available in the IP network to accommodate this.

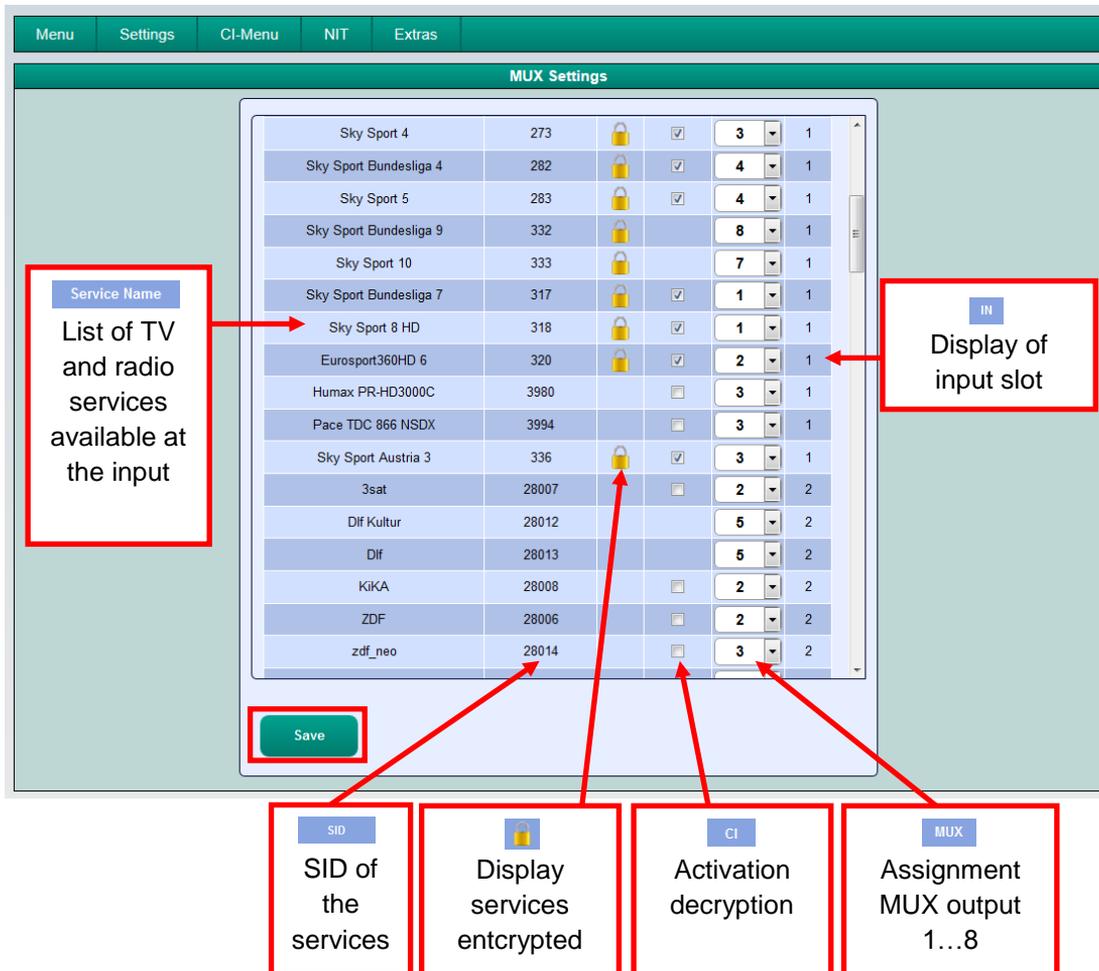
8.2.4. Multiplexing function

To optimize the capacities of the smart cards or/and to provide new program selections at the output of the compact headend, the PXU 848 IP offers a multiplexing function. Also certain services within a transponder can be deleted at the output if they are not desired. Furthermore, encrypted services can be selected for decryption via this function.

→ Click on **Menu * MUX Settings**



Now the following dialogue window will be displayed:



On the left side of the window, the list of available TV and radio services from the input is shown. In the column **IN**, the input slot (input tuner) of the respective program is displayed.

In the column **MUX**, a menu pops up, in which the corresponding outputs are assigned by selecting the number 1 - 8. When outputs 1 - 4 are selected, decryption by CAM is available as an option. The selection of the services/programs to be decrypted takes place by placing a check mark in the column **CI**.

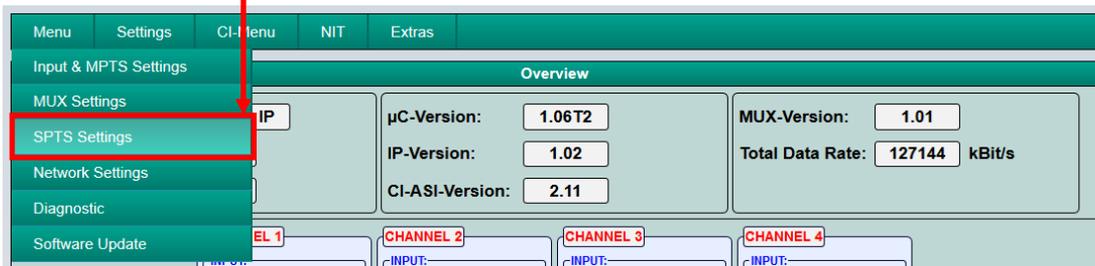
The assignment is as follows:

- | | |
|--------------------|-----------|
| 1 = MUX 1 via CI 1 | 5 = MUX 5 |
| 2 = MUX 2 via CI 2 | 6 = MUX 6 |
| 3 = MUX 3 via CI 3 | 7 = MUX 7 |
| 4 = MUX 4 via CI 4 | 8 = MUX 8 |

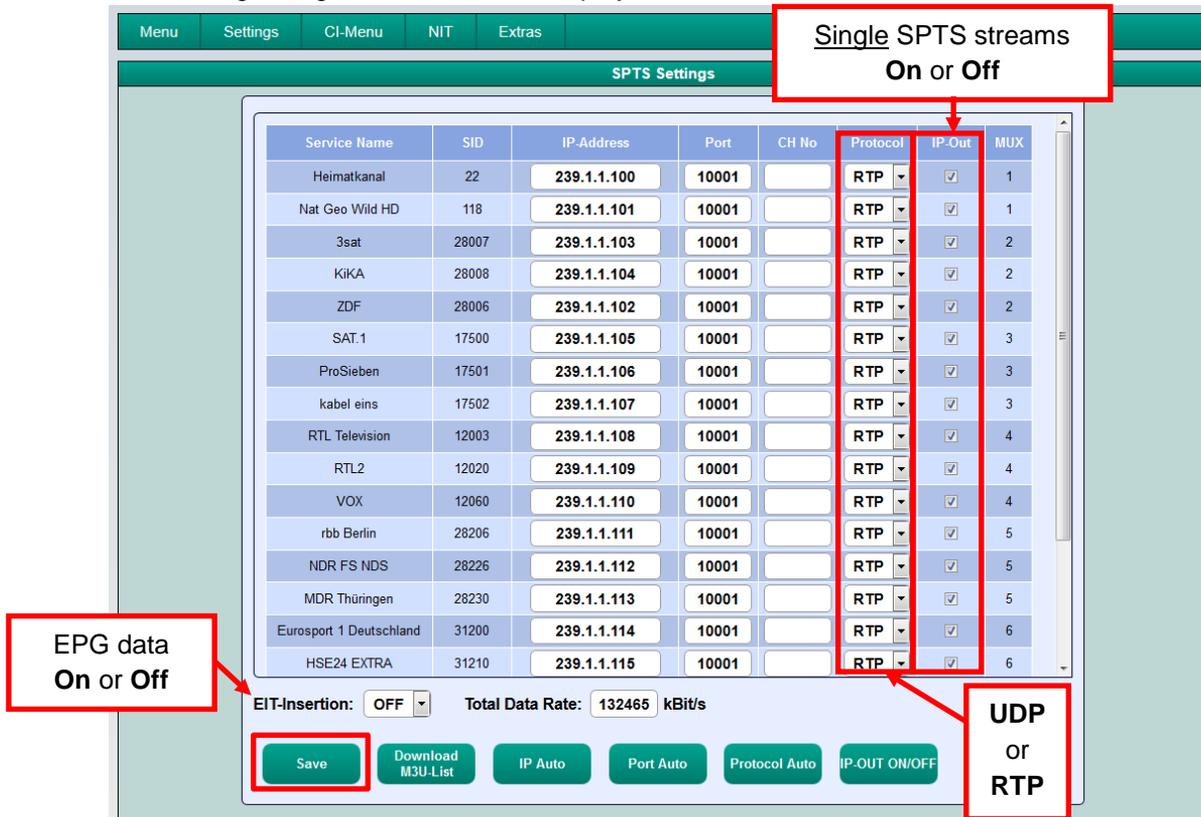
Press the button **Save** after finishing assignment of the desired programs to output channels and selection of the programs to be decrypted. The configuration will be saved.

8.2.5. Output parameters SPTS (Single Program Transport Stream)

➔ Click on **Menu * SPTS Settings**



Now the following dialogue window will be displayed:



The IP addresses, ports and network protocols can separately be set for each service (program) either manually or automatically via the control panels below. The network protocol can be selected separately for each service (program) → Factory setting: RTP. The SPTS stream can be switched on or off separately for each service (program) by placing a tick in the relevant box.

Note: In SPTS mode, the EPG function (EIT insertion) is switched off by default and can be activated as shown above. When it is activated, it must be ensured that sufficient bandwidth is available in the IP network to accommodate it.

➤ **Allocation of program numbers via the M3U list and create an M3U list**

In SPTS mode, it is possible to create an M3U list as follows:

The screenshot shows the 'SPTS Settings' window with a table of service configurations. The 'CH No' column is highlighted with a red box, indicating where to enter program numbers. Below the table, the 'Download M3U-List' button is also highlighted with a red box.

Service Name	SID	IP-Address	Port	CH No	Protocol	IP-Out	MUX
Heimatkanal	22	239.1.1.100	10001	1	RTP	<input checked="" type="checkbox"/>	1
Nat Geo Wild HD	118	239.1.1.101	10001	2	RTP	<input checked="" type="checkbox"/>	1
3sat	28007	239.1.1.103	10001	3	RTP	<input checked="" type="checkbox"/>	2
KIKA	28008	239.1.1.104	10001	4	RTP	<input checked="" type="checkbox"/>	2
ZDF	28006	239.1.1.102	10001	5	RTP	<input checked="" type="checkbox"/>	2
SAT.1	17500	239.1.1.105	10001	6	RTP	<input checked="" type="checkbox"/>	3
ProSieben	17501	239.1.1.106	10001	7	RTP	<input checked="" type="checkbox"/>	3
kabel eins	17502	239.1.1.107	10001		RTP	<input checked="" type="checkbox"/>	3
RTL Television	12003	239.1.1.108	10001	8	RTP	<input checked="" type="checkbox"/>	4
RTL2	12020	239.1.1.109	10001	9	RTP	<input checked="" type="checkbox"/>	4
VOX	12060	239.1.1.110	10001	10	RTP	<input checked="" type="checkbox"/>	4
Eurosport 1 Deutschland	31200	239.1.1.114	10001		RTP	<input checked="" type="checkbox"/>	6
HSE24 EXTRA	31210	239.1.1.115	10001	11	RTP	<input checked="" type="checkbox"/>	6
EURONEWS GERMAN SD	31230	239.1.1.116	10001	12	RTP	<input checked="" type="checkbox"/>	6
Disney Channel	1793	239.1.1.117	10001	13	RTP	<input checked="" type="checkbox"/>	7
SIXX	776	239.1.1.119	10001	14	RTP	<input checked="" type="checkbox"/>	7

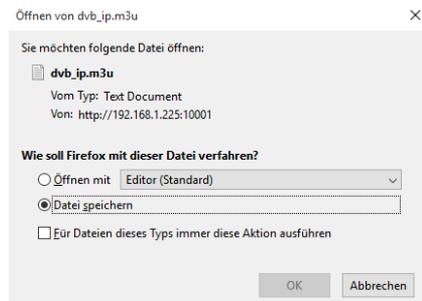
EIT-Insertion: OFF Total Data Rate: 129673 kBit/s

Buttons: Save, Download M3U-List, IP Auto, Port Auto, Protocol Auto, IP-OUT ON/OFF

In the column **CH No**, the desired program number can be entered. These programs will then be sorted in the M3U list in numerical order. Programs which have assigned no number are placed below those assigned programs. After completing the assignment of the channel numbers to the desired programs, click the **Save** button. The configuration will be saved.

Precondition is that the IP TV sets/STBs support M3U lists.

By clicking on **Download M3U-List**, an M3U list (file name: dvb_ip.m3u) of the currently active SPTS streams is created and can be saved on the PC / notebook (download directory).



This file can then be used to transfer the program list e.g. to PCs / notebooks with corresponding software, IP-compatible TV sets or set-top boxes (STBs) that support the "DVB-IPTV" standard. The device (client) must be able to support M3U lists.

➤ Identification of incorrect data entries

In the case of an error (e.g. double assignment of the IP address), the corresponding input fields are highlighted in red as following:

The screenshot displays the 'SPTS Settings' interface. At the top, there are navigation tabs: Menu, Settings, CI-Menu, NIT, and Extras. Below this is a table with the following columns: Service Name, SID, IP-Address, Port, CH No, Protocol, IP-Out, and MUX. The table contains 15 rows of data. The IP-Address column for 'Heimatkanal' and 'SAT.1' is highlighted in red, indicating a duplicate IP address of 239.1.1.100. A red arrow points from the text above to these two cells. Below the table, there are several controls: 'EIT-Insertion: OFF', 'Total Data Rate: 127793 kBit/s', and a row of buttons: 'Save', 'Download M3U-List', 'IP Auto', 'Port Auto', 'Protocol Auto', and 'IP-OUT ON/OFF'. The 'Save' button is highlighted with a red box.

Service Name	SID	IP-Address	Port	CH No	Protocol	IP-Out	MUX
Heimatkanal	22	239.1.1.100	10001		RTP	<input checked="" type="checkbox"/>	1
Nat Geo Wild HD	118	239.1.1.101	10001		RTP	<input checked="" type="checkbox"/>	1
3sat	28007	239.1.1.103	10001		RTP	<input checked="" type="checkbox"/>	2
KiKA	28008	239.1.1.104	10001		RTP	<input checked="" type="checkbox"/>	2
ZDF	28006	239.1.1.102	10001		RTP	<input checked="" type="checkbox"/>	2
SAT.1	17500	239.1.1.100	10001		RTP	<input checked="" type="checkbox"/>	3
ProSieben	17501	239.1.1.106	10001		RTP	<input checked="" type="checkbox"/>	3
kabel eins	17502	239.1.1.107	10001		RTP	<input checked="" type="checkbox"/>	3
RTL Television	12003	239.1.1.108	10001		RTP	<input checked="" type="checkbox"/>	4
RTL2	12020	239.1.1.109	10001		RTP	<input checked="" type="checkbox"/>	4
VOX	12060	239.1.1.110	10001		RTP	<input checked="" type="checkbox"/>	4
rbb Berlin	28206	239.1.1.111	10001		RTP	<input checked="" type="checkbox"/>	5
NDR FS NDS	28226	239.1.1.112	10001		RTP	<input checked="" type="checkbox"/>	5
MDR Thüringen	28230	239.1.1.113	10001		RTP	<input checked="" type="checkbox"/>	5
Eurosport 1 Deutschland	31200	239.1.1.114	10001		RTP	<input checked="" type="checkbox"/>	6
HSE24 EXTRA	31210	239.1.1.115	10001		RTP	<input checked="" type="checkbox"/>	6

After correcting and re-entering all data, they must be saved again by clicking on **Save**.

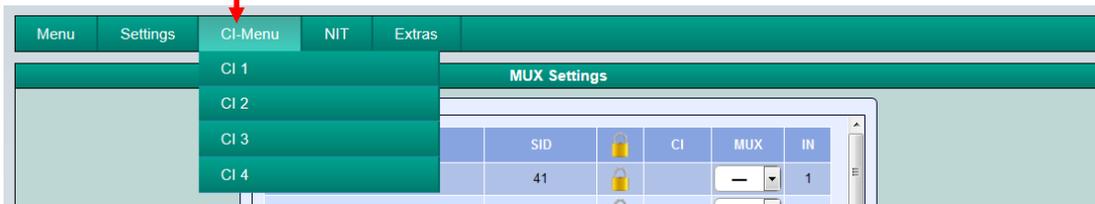
8.2.6. CI menu

A precondition of this operation is that the CAM module with corresponding smart card has been inserted into the CI slot while the headend is disconnected from mains. After reconnecting to power the CAM is recognized and initialized. The smart card must also be authorized to decrypt the desired programs. The status is displayed in the menu **Diagnostic**. If the plugged CAM module is not recognized, the message “No CAM available” appears if the menu item is selected.

If the CAM module with the corresponding smart card is not recognized, no services can be decrypted! The settings can be done in advance of the installation of CAMs and smart cards .

The selection of the services/programs to be decrypted takes place by placing a check mark in the column **CI**.

➔ Click on **CI-Menu * CI 1, CI 2, CI 3 or CI 4**



➔ Example display after click on **CI 1**

The screenshot shows a diagnostic screen titled 'CAM-Menu CHANNEL 1'. The content is as follows:

```
CA Diagnostics
->H/W: 5.1.5.2
->Bootloader: 1.2.0.0, L14, 0x0421
->Firmware: 4.2.7 M, App-V14, Apr 9 2018 17:20
->Verifier: 3.140.200.12 Apr 26 2018 09:27:49
->S/N: 39007000059908
->CAM-ID: 3900 7378 2239 9046
->Smart card status: READY
->Smart card ID: 30000162141378
->CAS ID: 98D
->SSU status: 0x03000017 0x05000017
->CA Diagnostics, Page 2
->Exit
```

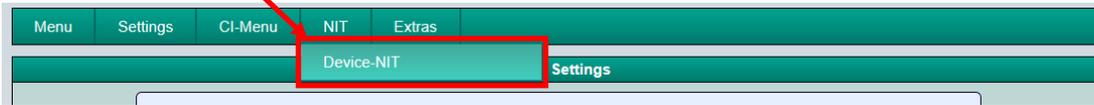
A red arrow points to the line '->Smart card status: READY'. Below the screenshot, a red-bordered box contains the text: 'Menu lines with an arrow in front are selectable and/or contain submenus. The menu structures always depend on the CAM manufacturer.'



The CAM modules should only be plugged in when the device is switched off.

8.2.7 Device NIT

→ Click on **NIT * Device NIT**



After selecting **Device NIT**, the following screen appears, where further entries are possible.

The screenshot shows the 'NIT Settings' screen. It has a menu bar at the top with 'Menu', 'Settings', 'CI-Menu', 'NIT', and 'Extras'. Below the menu bar is a header 'NIT Settings'. The main content area is divided into two sections: 'Network Data' and 'TSID Data'. The 'Network Data' section contains fields for 'NIT Mode' (set to 'ON'), 'Network ID' (3002, with a checked 'Hexadecimal' checkbox), 'Network Name' (Network), 'Country' (Germany), and 'ONID' (2114, with a checked 'Hexadecimal' checkbox). The 'TSID Data' section has a checked 'Hexadecimal' checkbox and a table with 8 rows. Each row has columns for 'Original' and 'New' values, with a right-pointing arrow between them. The 'Original' values are 0002, 0437, 0453, 0441, 0431, 0443, 0005, and 0006. The 'New' values are 0002, 0437, 0453, 0441, 0431, 0443, 0005, and 0006. A 'Save' button is at the bottom. Annotations include a red box around the 'ON' dropdown with the text 'Switch device NIT on or off as required (switched on by default)', a red box around the 'ONID' field with the text 'The pairing of ONID and TSID identifies the transponder.', and a red box around the 'Save' button.

Network Data			
NIT Mode:	ON		
Network ID:	3002	<input checked="" type="checkbox"/> Hexadecimal	
Network Name:	Network		
Country:	Germany		
ONID:	2114	<input checked="" type="checkbox"/> Hexadecimal	

TSID Data			
<input checked="" type="checkbox"/> Hexadecimal	Original		New
TSID CH1:	0002	>	0002
TSID CH2:	0437	>	0437
TSID CH3:	0453	>	0453
TSID CH4:	0441	>	0441
TSID CH5:	0431	>	0431
TSID CH6:	0443	>	0443
TSID CH7:	0005	>	0005
TSID CH8:	0006	>	0006

Note: Please check the data for plausibility and/or overlaps before entry!

Network ID: Factory setting **3002** (changes possible)

Network Name: Can be defined by the user.

Country: Factory setting **Germany** (changes possible)
The country code should be the same as the receiver setting.

TSID New: If necessary, a new TSID can be assigned. We recommend assigning hexadecimal values in the range between F001 and FFFE.

Click **Save** to apply the changes.

8.3 Storage of programming / Restart IP streamer

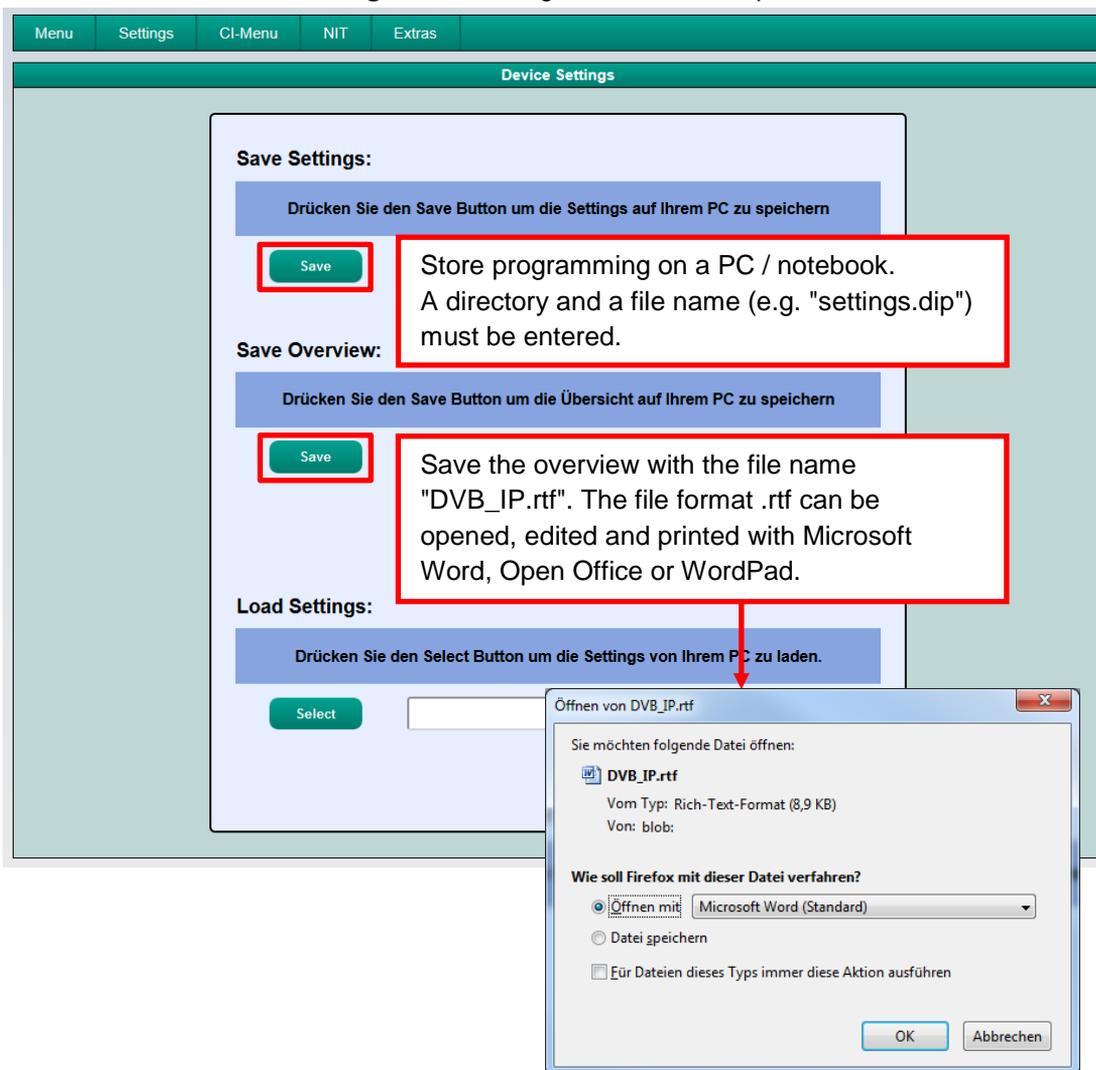
It is possible to save an existing programming dataset on a PC / notebook or to load it from the same device. In this way it is possible to archive device constellations. If required, the IP Streamer can be restarted.

➤ Storage of settings or overviews

➔ Click on **Settings * Save / Load Settings**



After selection of **Save / Load Settings** the following window will be opened.



➤ Upload of settings

The screenshot illustrates the process of uploading settings from a PC to the device. The interface is titled "Device Settings" and has a menu bar with "Menu", "Settings", "CI-Menu", "NIT", and "Extras".

Save Settings: Drücken Sie den Save Button um die Settings auf Ihrem PC zu speichern. (Save button)

Save Overview: Drücken Sie den Save Button um die Übersicht auf Ihrem PC zu speichern. (Save button)

Load Settings: Drücken Sie den Select Button um die Settings von Ihrem PC zu laden. (Select button)

The file explorer window shows the selection of the file "settings.dip" in the directory "Computer > DATEN (D:) > PXU848IP-BDA". The file name "settings.dip" is entered in the "Dateiname" field. The "Öffnen" (Open) button is highlighted.

The "Load Settings" section is highlighted with a red box, showing the file name "settings.dip" in the input field and the message: "Kopfstelle wird jetzt neu gestartet! Dies kann ca. 45s dauern, bitte warten..."

Via the menu item **Load Settings**, the upload of an existing programming dataset from the PC / notebook to IP Streamer PXU 848 IP is possible. The data will then be loaded automatically within about 45 - 60 seconds.

➤ Restart the device

➔ Click on **Settings * Restart Headend**, to restart the streamer.



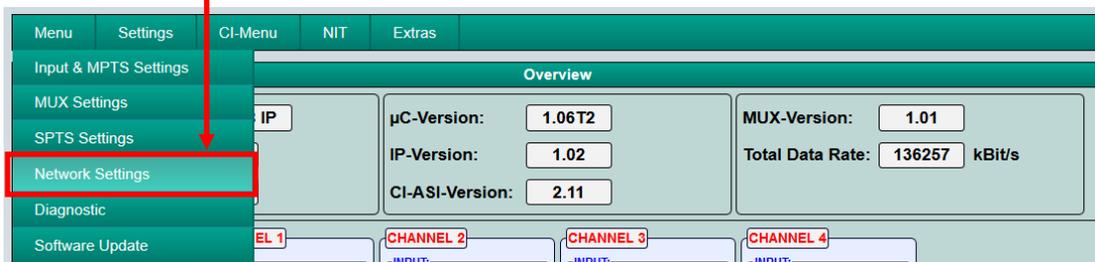
After selection of **Restart Headend** an information window will be opened and a restart of the device occurs.



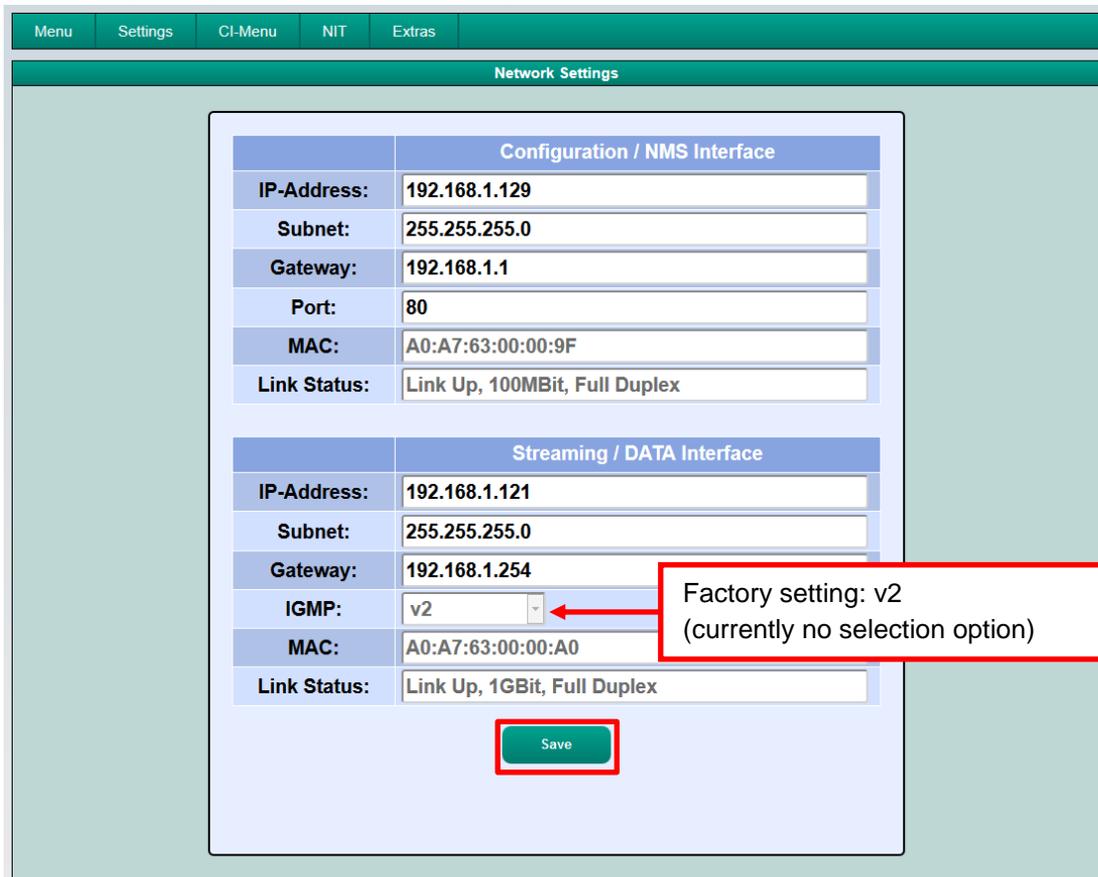
This takes approx..50 seconds. After the restart, the system data is loaded and the window **Overview** opens automatically.

8.4 Network settings

➔ Click on **Menu * Network Settings**



Now the following dialogue window will be displayed:



With **Save**, all changes are stored. The following restart of the headend can take up to one minute.

Note: The IP addresses listed are only examples. All addresses must be adapted to the local network. If this information isn't known, the responsible IT specialist should be contacted.

By default the IP Streamer PXU 848 IP have the following IP address: 192.168.1.129
 If the system is used in a network with a different network address, the IP address must be adapted accordingly.

Example:
 The PC operated in the network has the following settings:

IP address: 192.168.1.068

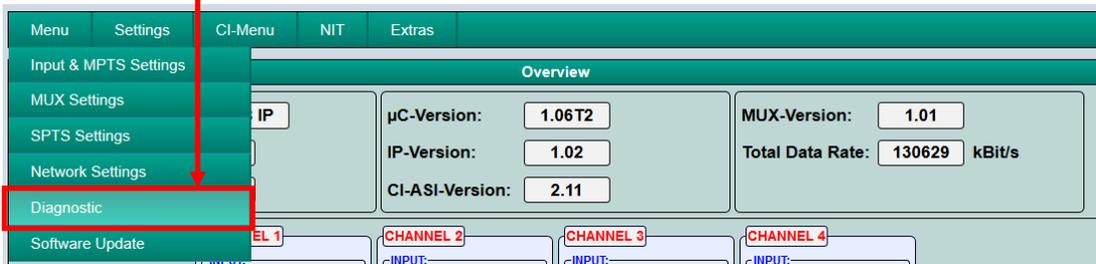
Network share Host share

The IP address of the Streamer may differ only in the last block (host share) compared to the connected PC / notebook. The figures 0, 255 and all values already in use are not permitted!

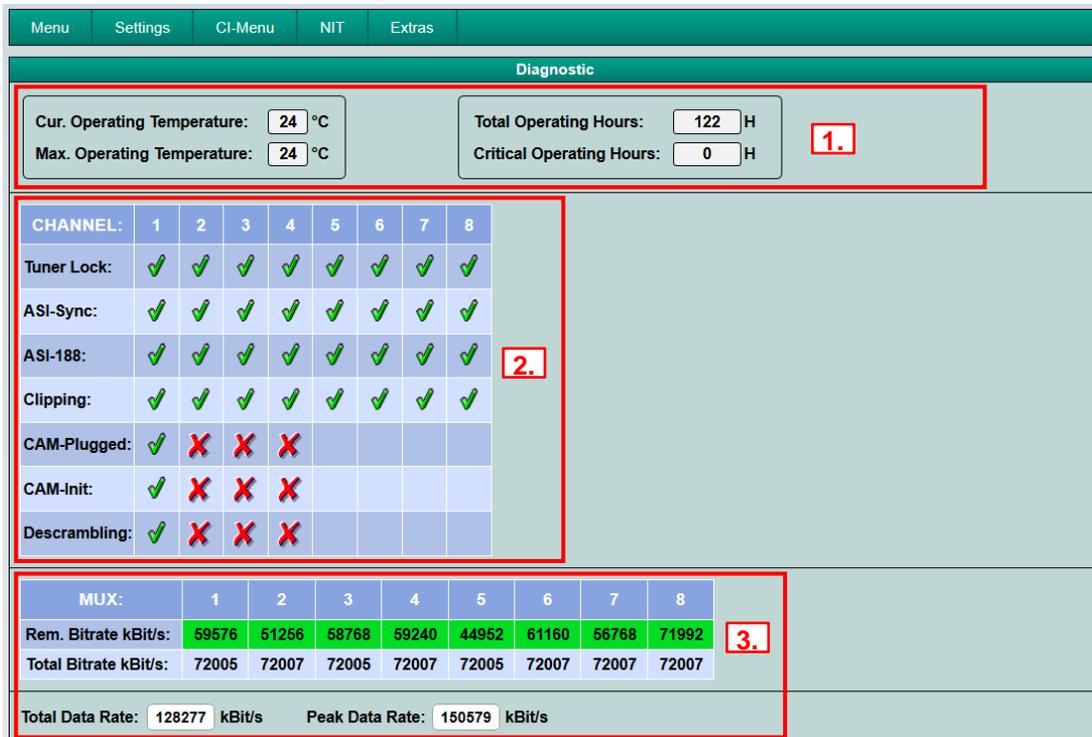
Example IP address of the streamer in this application: 192.168.001.129 (factory IP address)

8.5 Diagnostic

➔ Click on **Menu * Diagnostic**



The following submenu will be opened. The status display is automatically updated every 3 seconds.



The "Diagnostic" menu is used for service purposes and can be helpful for telephone error analysis via the **Hotline +49 (0) 7081 / 1702-0**.

1. In the menu header, the operating data of the device will be displayed.

Actual Operating Temperature:	approx. current environmental temperature
Total Operating Hours:	operating hours
Maximum Operating Temperature:	maximum measured environmental temperature
Critical Operating Hours:	operating hours at environmental temperature over 45°C

Note: The temperatures shown only correspond to the current values in the case of correct, vertical installation with a closed housing cover.

2. In the middle part of the menu, the input and CI parameters of each slot will be monitored. A  shows the error free function and a  a possible error.

Tuner Lock:	Tuner locked to the adjusted input frequency
ASI-Sync / ASI-188 / Clipping:	Monitoring of the internal transport streams
CAM-Plugged:	Confirmation that the CAM module is plugged in
CAM-Initialized:	Confirmation that the CAM module is initialized
Descrambling:	Confirmation that the CAM module decrypted services

3. In the lower part, the internal function units of the channels will be monitored. A  shows the error free function and a  a possible error.

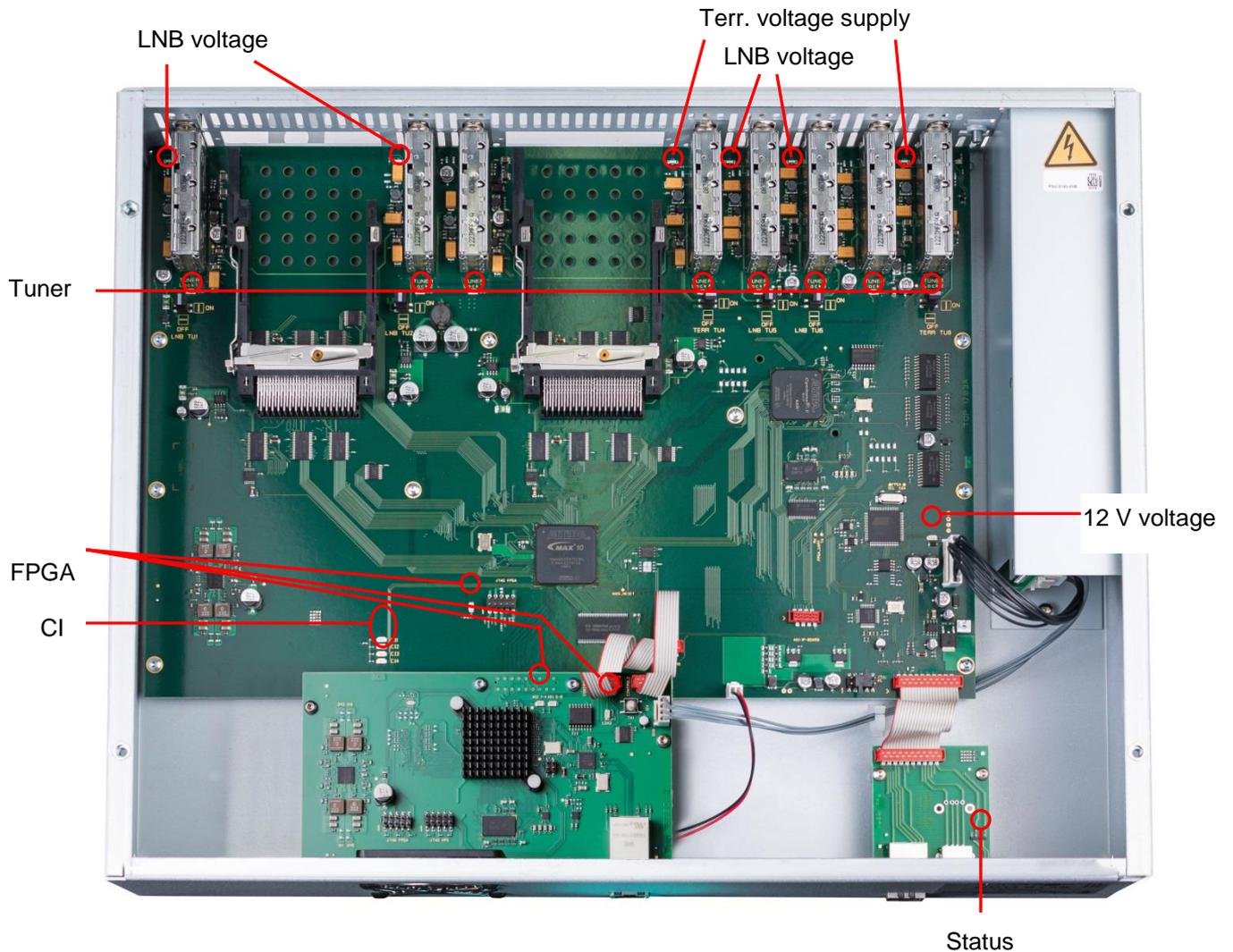
Rem. Bitrate kBit/s:	Remaining bit rate per MUX channel
Total Bitrate kBit/s:	Total bit rate per MUX channel
Total Data Rate:	Total data rate of the output stream
Peak Data Rate:	Peak data rate of the output stream → The current peak value is stored hourly. → After mains disconnection restart, or relevant data-related parameters are changed, the values are reset.

The fields **Rem. Bitrate MUX 1 - 8** are marked in colours after checking:

- **Green:** More than 10000 kSym of data rate capacity remaining.
- **Orange:** Fewer than 10000 kSym capacity remaining.
- **Red:** Fewer than 5000 kSym capacity remaining.

8.6 LED analysis

LNB	green: off:	12V voltage on no voltage
Tuner	green continuous: green flashing:	Tuner locked Tuner not locked
FPGA	green: off:	configured, ready to operate error
12 V	green: off:	12 V voltage okay power supply error
CI	green: off:	CAM 1-4 detected and initialized no CAM detected
Status	green: orange:	all tuners locked, ready for use different functions in programming



8.7 Software update

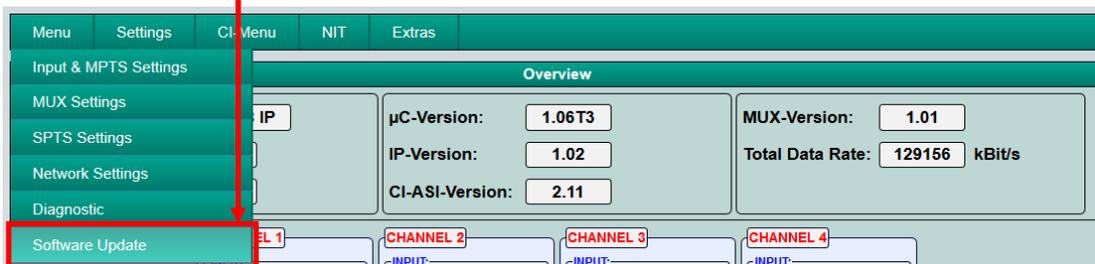
The **Software Update** menu is used to update the controller software of the device.

A prerequisite is that the latest programming software is installed on the PC/Laptop. This is available for download at the following web address: <https://polytron.de/index.php/de/service/download>.

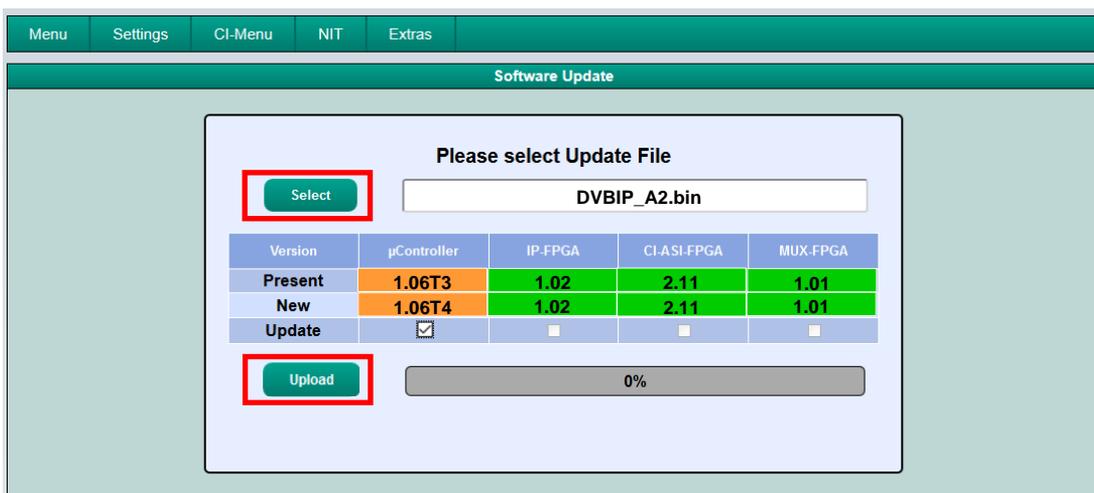
All set parameters are retained after the update.

Important: Please follow the update instructions carefully. Do not turn off the unit or unplug the power cord from the wall outlet. Failure to follow the instructions or interrupt the power supply while installing the new controller software may interrupt the update process and cause the unit to stop responding or require repair.

→ Click on **Menu * Software Update**



Use **Select** to find the appropriate folder with the update file, select the .bin file and open it.



While loading the overview, a comparison of the software data takes place. The fields with the software versions will be highlighted:

- Green means: Software is up to date.
- Orange means: Newer software exists, an update is possible.

The individual software files can be updated selectively. To do this, select the desired update(s) in the **Update** line by ticking and start the update process by clicking the button **Upload**.

The software files are now uploaded one after the other. The IP streamer is then rebooted and the new software will be installed.

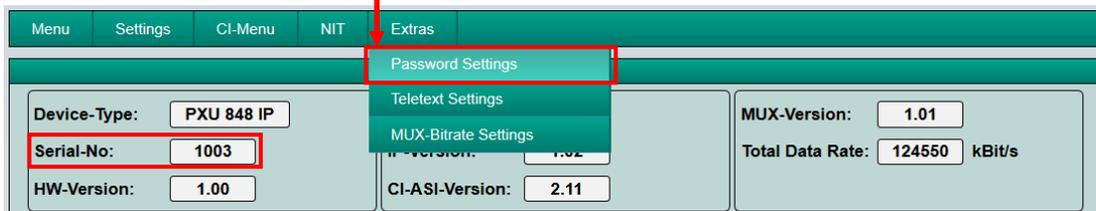
8.8 Extras/additional adjustments

In certain applications, advanced settings and an intervention in the transport stream are necessary. In the menu item **Extras**, settings can be made for these applications.

8.8.1 Function „Password“

The menu item **Password Settings** allows changes of the access data to the device and with this an increased access security.

➔ Click on **Extras * Password Settings**

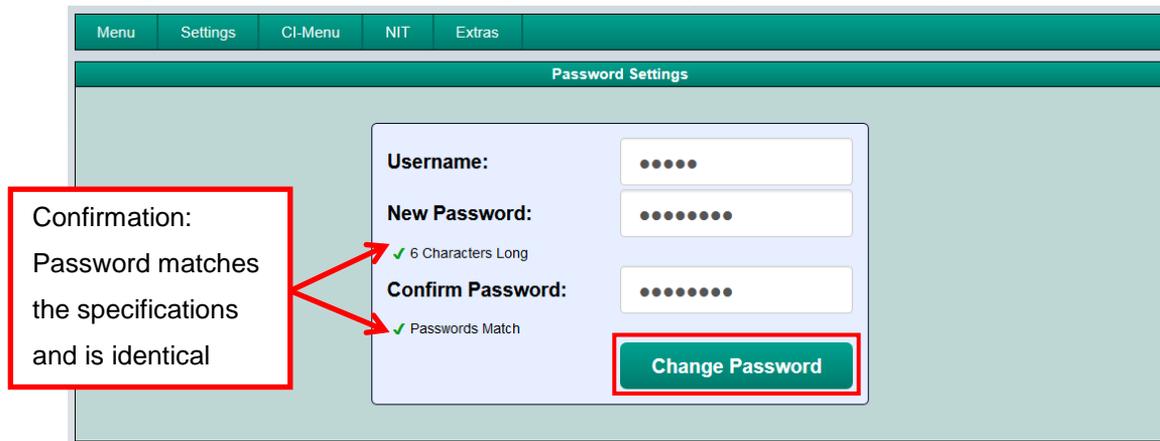


Important: Please make sure to note the serial number, as this is required to reset the password if necessary. The serial number is displayed on the Overview window (overview).

If the password is lost or forgotten, we will be happy to help with the general password reset. For this we would need the serial number of the device. The serial number can also be found on the label on the outside of the device housing. The general password reset can only be done by POLYTRON. For this process we generate a new password with which the device can be unlocked again.

Note: The password protection is activated ex-works.

After pressing the button **Password Settings**, the following input menu will be opened.



If required, assign a new user name (consisting of letters, numbers or special characters) in the **Username** field. In the **New Password** field, enter the new password with at least 6 digits (consisting of letters, digits or special characters in any order). Then enter the new password again in the **Confirm Password** field.

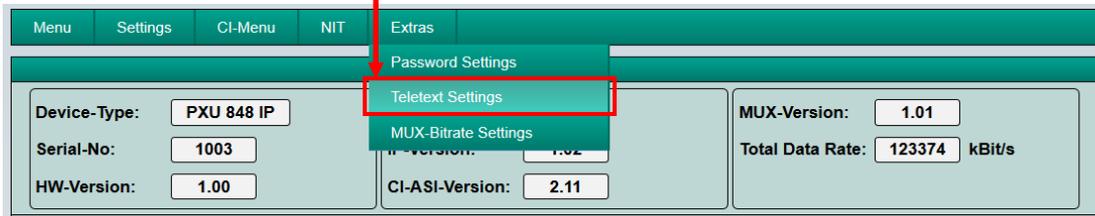
Click **Change password** to save the new password.

Note: After changing / saving the new login data, the login data is queried again when the next operation is attempted.

8.8.2 Function „Teletext Settings“

The menu **Teletext Settings** allows the activation and deactivation of teletext data.

➔ Click on **Extras * Teletext Settings**



The following input window will be opened:

The dialog box is titled 'Select Teletext Mode'. It contains a 'Teletext:' label followed by a dropdown menu currently set to 'ON'. Below the dropdown is a green 'Save' button, which is highlighted with a red border.

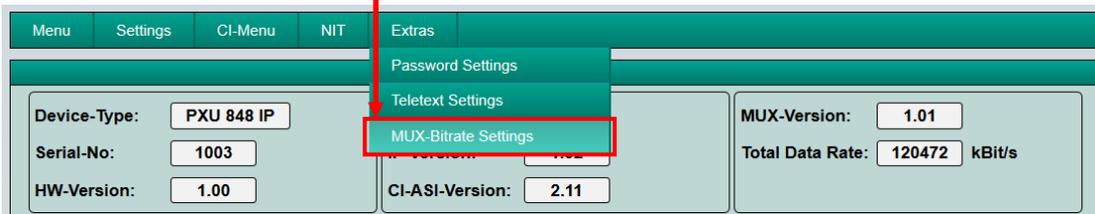
By selecting the required setting, the teletext is switched on or off. This applies to all services that are processed by the IP streamer. Click **Save** to apply the changes.

Note: In the factory setting, the teletext is switched on.

8.8.3 Function „MUX-Bitrate Settings“

The menu **MUX-Bitrate Settings** allows to adjust static or dynamic bit rates of the output multiplex.

➔ Click on **Extras * MUX-Bitrate Settings**



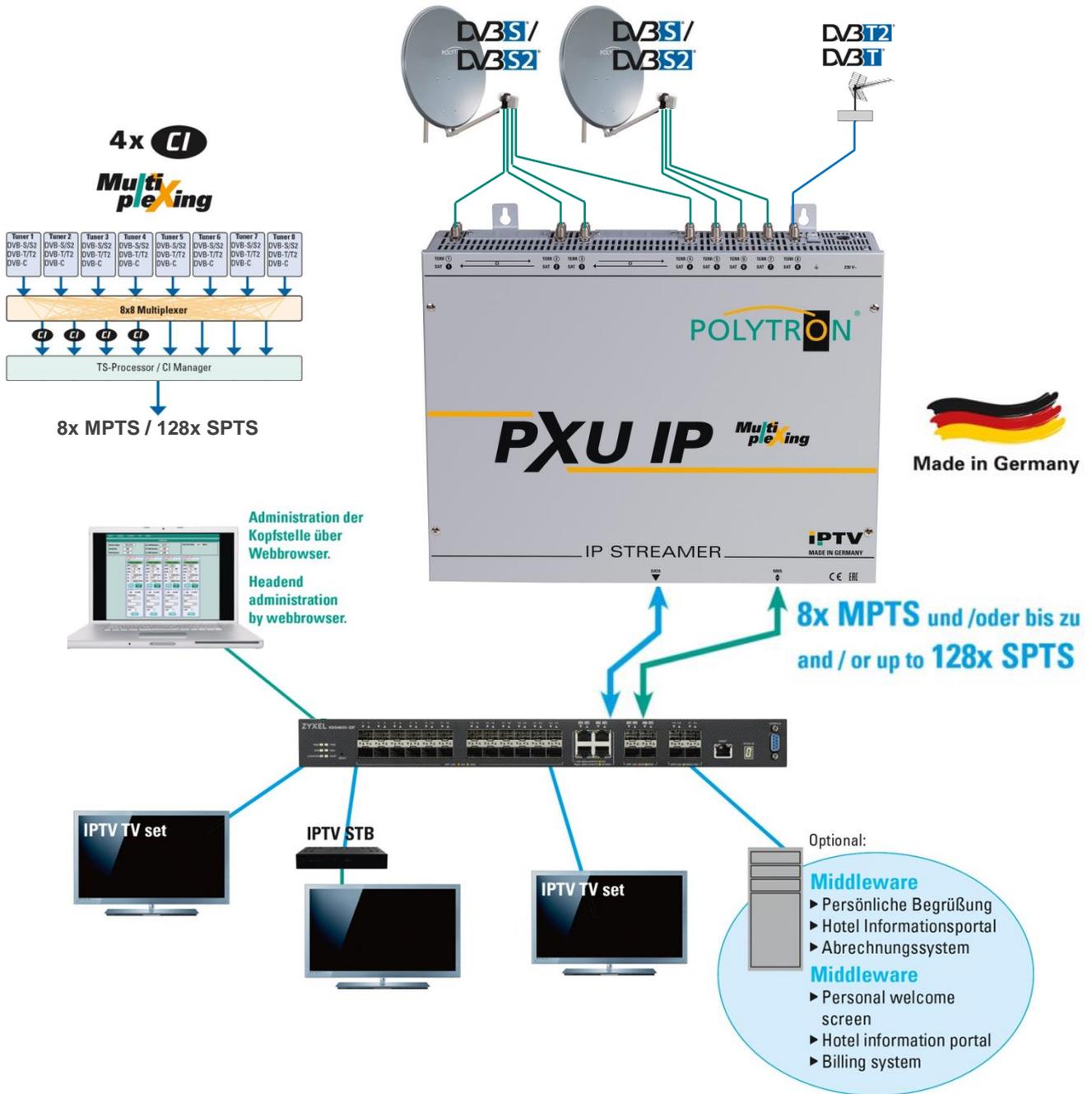
The following window will be opened:

The dialog box is titled 'Select MUX-Bitrate'. It contains a table with 8 rows, each representing a MUX channel. Each row has a label (MUX1-MUX8), a dropdown menu, and a unit 'MBit/s'. The values in the dropdowns are: MUX1: 50, MUX2: AUTO, MUX3: 50, MUX4: 72, MUX5: 96, MUX6: 72, MUX7: 72, MUX8: 72. A green 'Save' button is at the bottom.

MUX	Bitrate	Unit
MUX1:	50	MBit/s
MUX2:	AUTO	MBit/s
MUX3:	50	MBit/s
MUX4:	72	MBit/s
MUX5:	96	MBit/s
MUX6:	72	MBit/s
MUX7:	72	MBit/s
MUX8:	72	MBit/s

This menu enables the setting of a static (**50 MBit/s**, **72 MBit/s** or **96 MBit/s**) or a dynamic data rate (**AUTO**) according to the applied input data rate of the services.

9. Application



10. Technical data

Type	PXU 848 IP
Article no.	5552340
Inputs	8
CI slots	4
Multiplexing	8 x 8 (service based)
Input connector A	
Connector	F female
Input frequency	950 ... 2150 MHz (1 MHz steps)
Input level	50 ... 80 dB μ V
Input connector B	
Connector	F female
Input frequency	110 ... 862 MHz (250 kHz steps)
Input level	50 ... 80 dB μ V
Demodulator	
DVB-S/S2	
SR DVB-S / QPSK	1 ... 45 MS/s
SR DVB-S2 / QPSK	1 ... 45 MS/s
SR DVB-S2 / 8PSK	1 ... 45 MS/s
Modulation	8PSK / QPSK
CR DVB-S / QPSK	1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
CR DVB-S2 / 8PSK	3/5, 2/3, 3/4, 5/6, 8/9, 9/10
Roll off	0.35, 0.25, 0.20
DVB-T	
Modulation	QPSK, 16QAM, 64QAM
FFT	2K, 8K
Bandwidth	7, 8 MHz
Code rate	1/2, 2/3, 3/4, 5/6, 7/8
Guard interval	1/4, 1/8, 1/16, 1/32
DVB-T2	
Modulation	QPSK, 16QAM, 64QAM, 256QAM
FFT	1K, 2K, 4K, 8K, 16K, 32K
Bandwidth	7, 8 MHz
Code rate	1/2, 3/5, 2/3, 3/4, 4/5, 5/6
Guard interval	1/4, 5/32, 1/8, 5/64, 1/16, 1/32, 1/64, 1/128
DVB-C	
Modulation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Symbol rate	0.2 ... 7.2 MS/s
Bandwidth	6, 7, 8 MHz
IP output	
Interface	RJ45
Standard	1000-Base-T
Data rate	max. 800 Mbit/s
Protocol	MPEG over UDP/RTP (Unicast / Multicast)
IGMP	V2
Format	8x MPTS / max. 128 SPTS
Generation of M3U lists	Yes
Operation parameters	
Operation temperature	0 ... 45 °C
Supply voltage	180-265 V \sim , 50/60 Hz, 45 W
Dimensions (W x H x D)	428 x 331 x 103 mm

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Technische Änderungen vorbehalten
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