GOING FUTURE TODAY.

IPQ BOX 16

Compact headend

Operating manual

Version 01-2026A

Content

Before you start using the device

HINWEIS: *Please read this operating manual carefully! It contains important information about installation, environmental conditions and maintenance of the device. Keep this operating manual for future reference and for transfer in the event of a change of ownership or operator. A PDF version of this manual (possibly an updated version) is available for download on the ASTRO website.*

ASTRO confirms that the information in this manual is correct at the time of printing, but reserves the right to make changes to the specifications, operation of the device and the operating instructions without prior notice.

Symbols and conventions used

Symbols used in this guide

Pictograms are symbols with a defined meaning. You will encounter the following pictograms in these installation and operating instructions:

Warns of situations in which there is a risk of death due to electrical voltage and failure to observe the instructions in this manual.

Warns of various hazards to health, the environment and materials.

Warns of thermal hazards (risk of burns).

Recycling symbol: indicates that components or packaging material (cardboard boxes, inserts, plastic film and bags) can be recycled. Used batteries must be disposed of at approved recycling centres. To do this, the batteries must be completely discharged before disposal.

Indicates components that must not be disposed of in household waste.

Intended use

The IPQ BOX 16 compact headend is intended exclusively for converting a DVB-S2 input signal into 16 independent output channels.

Modification of the devices or use for any other purpose is not permitted and will immediately void any warranty provided by the manufacturer.

Target groups for these instructions

Installation and commissioning

The target group for the installation and commissioning of ASTRO headend technology are qualified specialists who, based on their training, are capable of performing the work to be carried out in accordance with EN 60728-11 and EN 62368-1. Unqualified persons are not permitted to install and commission the device.

Device configuration

The target group for configuring the ASTRO headend are trained individuals who are capable of making settings based on their training. Knowledge of EN 60728-11 and EN 62368-1 is not required to make settings.

Device description

Read these operating instructions carefully before using the device and keep them for future reference.

The following parts are included in the scope of delivery:

- ☐ IPQ BOX 16
- ☐ 2 mounting brackets
- ☐ 4 screws(M4) with dowel (6 mm)
- ☐ 4 x termination resistor FUR 75
- ☐ Patch cable with RJ-45 connection, 1 m long
- ☐ Instruction leaflet (includes link to manual)

Front:

[1] RF output
[2] Testpoint 20 dB
[3] CI Slots 1-6
[4] SAT inputs 1-4
[5] SAT inputs 5-8 (only IPQ BOX 32)
[6] Power-On LED
[7] Status LED
[8] Slot for SD card
[9] Data Ports A and B
[10] Management Ports A and B

Back:
Power cord

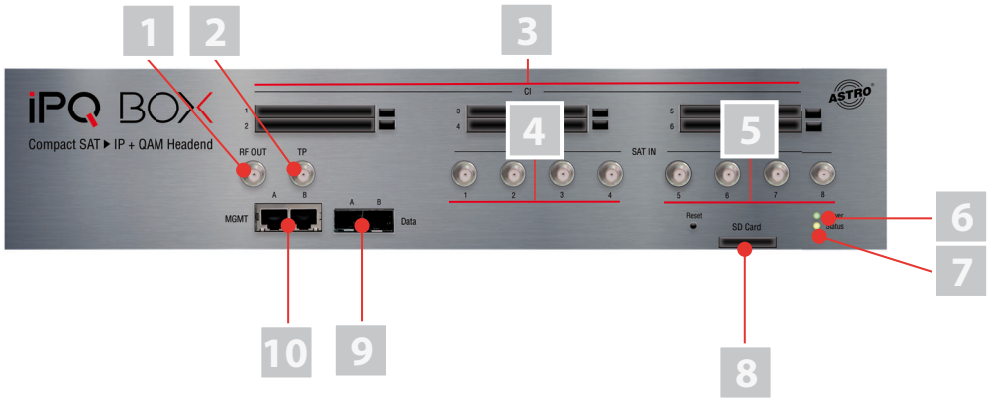


Figure 1: pin assignment

The IPQ BOX has a CE mark. This confirms that the products comply with the applicable EC directives and meet the requirements specified therein.

Important safety information

To avoid any hazardous situations to the extent possible, you must adhere to the following safety information:

*ATTENTION: **Failure to observe this safety information may result in personal injury due to electrical and thermal dangers!***

Proper use

- Only use the device at the approved operating sites and in the ambient conditions allowed (as described in the following), and only for the purpose described in the section “Proper use”.

Before starting operation of the device

NOTE: Read this operating manual attentively! It contains important information about installation, ambient conditions and maintenance of the device. Keep this operating manual for future use and for handover in the event of a change of owner or operator. A PDF version of this manual is available to download on the ASTRO website (there may be a more recent version).

- Check the packaging and the device for transport damage immediately. Do not start operation of a device that has been damaged.
- Transporting the device by the power cable may damage the mains cable or the strain relief, and is therefore not permitted.

Installation, operation, maintenance

- 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 qualified persons. Maintenance work may only be carried out by qualified service personnel.
- The installation site must be planned in a way that prevents children from playing with the device and its connections.
- To avoid inadmissible operational states, only components described within this manual or components that are approved by the manufacturer can be used.
- The electrical connection conditions must correspond to the specifications on the device type plate.
- To avoid damage due to overheating, the device may only be installed on vertical surfaces. The installation basis should be level and non-flammable. Operating position: Device vertical, with power cable outlet at the bottom.
- The ambient temperatures specified in the technical data must be complied with, even when climatic conditions change (e.g. due to sunlight). If the device overheats, the insulation used to isolate the mains voltage may be damaged.
- The device and its cable may only be operated away from radiant heat and other sources of heat.
- To avoid trapped heat, ensure there is good ventilation on all sides (minimum interval of 20 cm to other objects). Installing the device in recesses or covering the installation location, e.g. with curtains, is not permitted. Ventilation openings may not be covered.
- If the device is installed in a cabinet, ensure adequate air convection is possible to avoid exceeding the maximum ambient temperature permitted for the device.
- According to EN623681-1 a mounting height of < 2 m above ground level must be aimed to avoid personal injury.
- No objects may be placed on the device.

- The subscriber network must be earthed in accordance with EN 60728-11 and must remain earthed even when the device is removed. In addition, the earth connection on the device can be used. Devices within hand’s reach must also be integrated into the potential equalisation. Operating the device without an earth conductor, without earthing the device or without equipotential bonding of the device is not permitted.
- The device does not feature protection against water and may therefore only be operated and connected in dry rooms. It must not be exposed to spraying or dripping water, to condensation, or to similar sources of moisture.

- Housing components near the cooling fins at the rear, or actual the cooling fins, may become very hot. You should therefore not touch these parts.
- The electrical system supplying current to the device, e.g. a house installation, must incorporate safety devices against excessive current, earth leakages and short-circuiting in accordance with EN 62368-1.

- To operate the device (protection class I), it must be connected to mains power sockets with a protective earth conductor.
- All adhere to all applicable national safety regulations and standards.
- The mains plug is used as a mains voltage disconnect unit in the event of servicing and danger, and must therefore be accessible and be able to be operated at any time. The device is operational when connected to the mains power.
- Excess mechanical loads (e.g. falling, impacts, vibrations) may damage insulation used to provide protection from mains voltage.
- High excess currents (lightning strike, surges in the power utility grid) may damage insulation used to provide protection from mains voltage.
- Do not insert any objects through the ventilation slots.
- If there is no information about intended use (e.g. operating site, ambient conditions), or the operating manual does not include the corresponding information, then you must consult the manufacturer of this device to ensure that the device may be installed. If you do not receive any information on this from the manufacturer, do not start operating the device.

Maintenance

- The operating display only shows whether the DC current, which supplies the device components, has been disconnected. However, operating displays (on the power supply unit or the device) that are not lit up in no way indicate that the device is completely disconnected from the mains.
- Read carefully: EN 60728-11 Safety requirements: No service work during thunderstorms.

Repair

- Repairs may only be performed by the manufacturer. Improperly performed repairs may result in considerable dangers for the user.
- If malfunctions occur, the device must be disconnected from the mains and authorised experts must be consulted. The device may need to be sent to the manufacturer.

Performance description

The IPQ BOX compact headend has the following performance characteristics:

- 16 SAT inputs (4 input sockets), IPQ BOX32: 32 SAT inputs (8 input sockets)
- 16 QAM outputs, IPQ BOX 32: 32 QAM outputs
- 6 CI slots
- Unicable/JESS control
- Drop-/Pass filter
- 2 management ports
- SD card slot for storage of config data
- 19 inch device, 2 HU
- License: Multipexing
- License: TLS on/off
- License: Common Scrambling
- 19" and wall mounting

Warranty conditions

The general terms and conditions of ASTRO Strobel GmbH apply. You will find these in the current catalogue or on the Internet under “www.astro-kom.de”.

Disposal

All of our packaging material (cardboard boxes, inserts, plastic film and bags) is completely recyclable. Electronic devices must not be disposed of with household waste, but rather – according to DIRECTIVE 2012/19/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL from 4 July 2012, on waste electrical and electronic equipment – must be properly disposed of. When it is no longer of use, please bring the device for disposal to one of the public collection points for this purpose.

Install and connect

It is essential that you observe the regulations for installation and mains connection described in the section ‘Important safety instructions’!

Mounting the device

Mounting in a 19 inch cabinet

For cabinet mounting, the mounting brackets can be fixed either flush with the front panel (A) or as shown in Figure B. First, screw the two shorter mounting brackets to the IPQ BOX as shown in Figure 2 (below).

Then mount the IPQ BOX with the mounting brackets screwed on in the 19-inch cabinet as usual by

screwing the mounting brackets to the retaining plates of the cabinet.

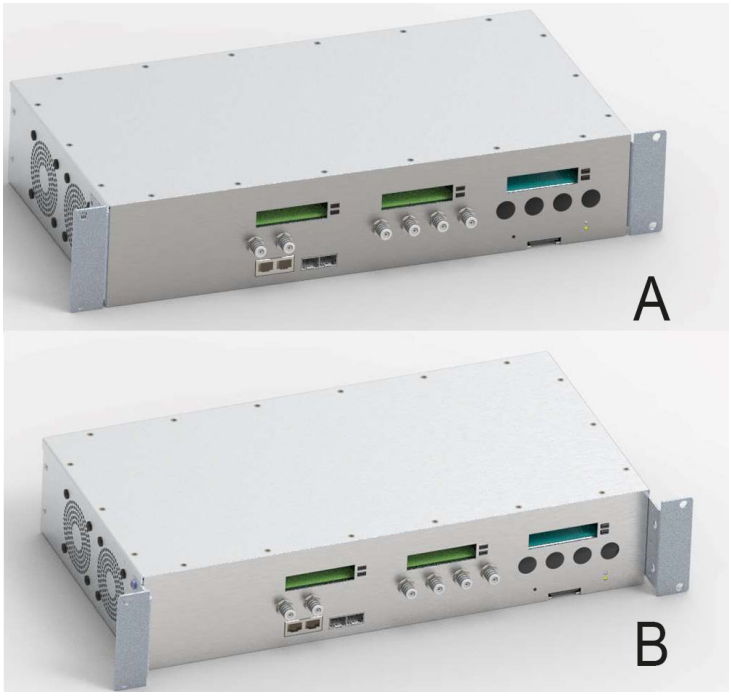


Figure 2: Mounting in a 19 inch cabinet

Wall mounting

To mount the IPQ BOX on a wall, first screw the two longer mounting brackets to the device as shown in Figure 3 (below).

Then use the screws and dowels included in the scope of delivery to attach the device to the wall.

Figure 3: Wall mounting

ATTENTION: SAT inputs that are not in use must be connected to a FUR 75 DC prof termi-nating resistor (galvanic isolation required due to remote power supply)!

Ensure that the mains voltage, signal sources, etc. are correctly connected to the corresponding connections on the device. The local mains voltage must correspond to the supply voltage specified for operating the device (see section ‘Technical data’).

Inserting CI cards into the IPQ BOX

NOTE: The CI cards can be installed and removed even during operation.

First insert the CI cards into CI modules and then insert the modules into one of the six CI slots [3] on the IPQ BOX.
To remove a CI module, press the corresponding eject button to the right of the slot and remove the module.

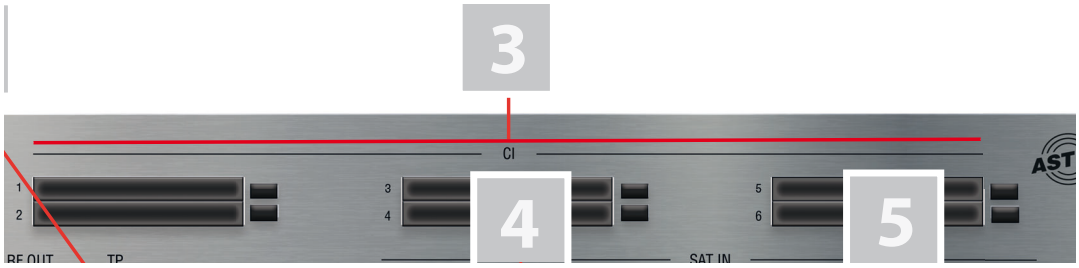


Figure 4: CI slots

Connecting the device to a set-top box or tuner

NOTE: Your PC or laptop must be configured appropriately via the operating system's network settings! Once you have connected the device to your PC or laptop via your network connection, you can begin configuration via the web browser interface.

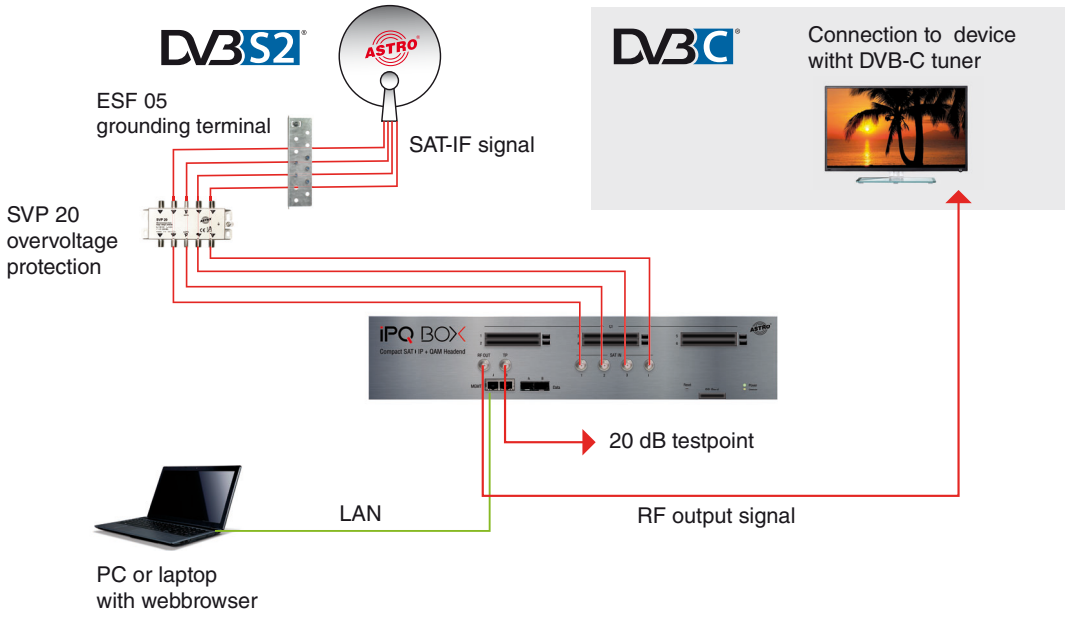
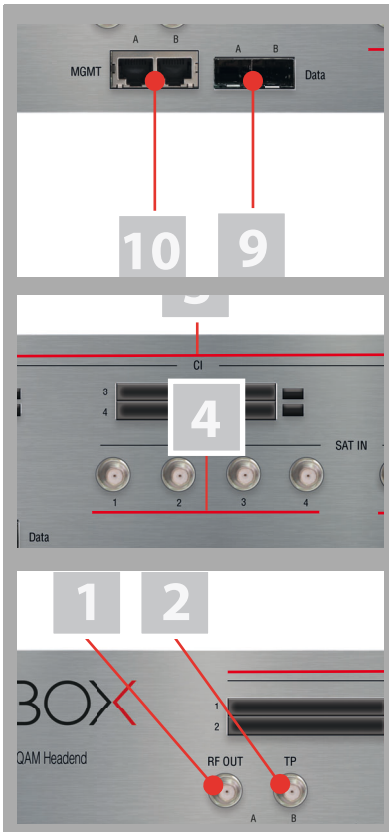


Figure 5: Connecting the IPQ BOX



TASK

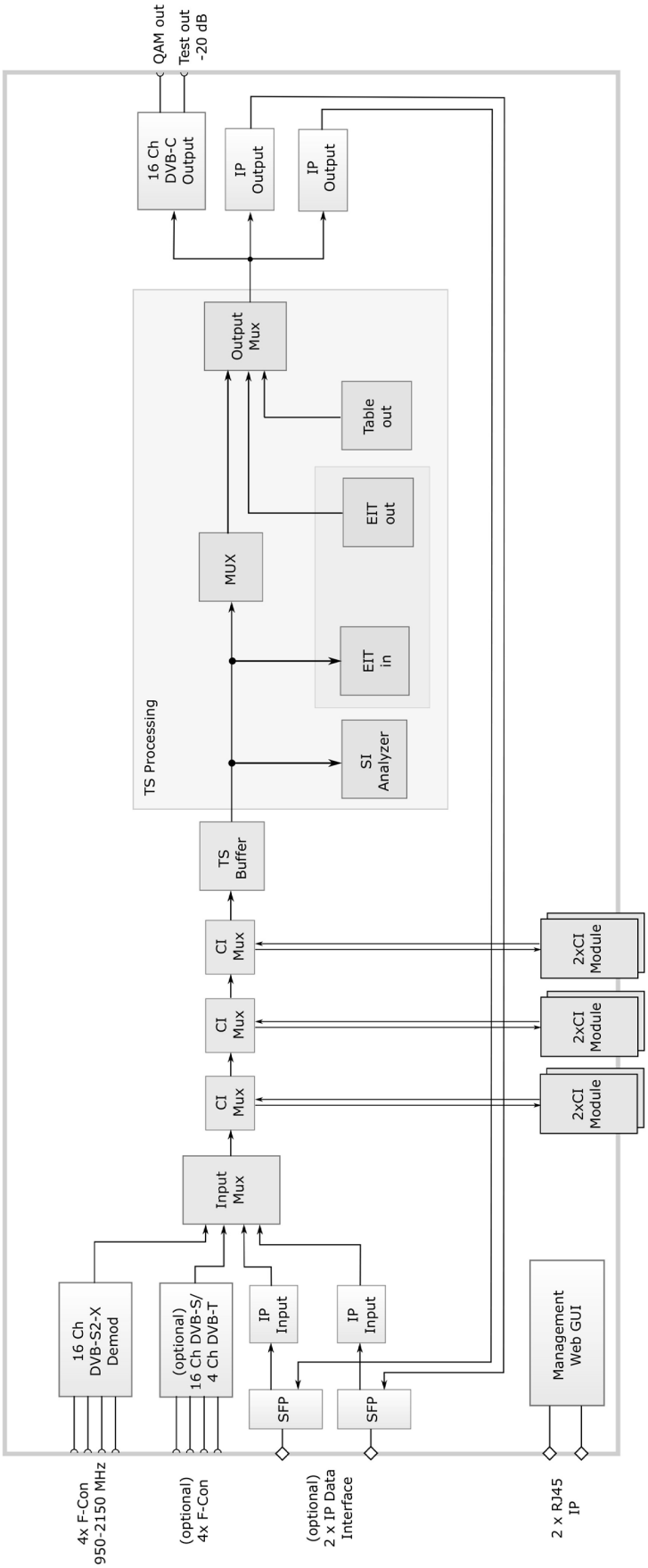
1. To configure the device via the web browser interface, connect your network or laptop or PC to one of the device's two RJ 45 ports (see position [9], figure on the left).
2. Connect the SAT input sockets (see positions [4], left) to the corresponding SAT levels of the SAT IF signal using coaxial cables (see Figure 2). Please note the labelling of the inputs on the device.
3. Connect the HF output socket (see position [1], left) of the device to a set-top box or a television set with a DVB-C tuner or to several tuners or set-top boxes by inserting appropriate distributors and splitters.
4. Now plug in the power cable for the IPQ BOX.

RESULT:

The device is now connected and you can begin configuration via the web browser interface.

Device concept

The following overview shows the possible signal paths of the IPQ BOX 16:



Quick start – putting the IPQ BOX 16 into operation

Once you have connected the IPQ BOX to the mains power supply, it will switch on automatically. Make a note of the address of the management port that you are using for your PC or laptop so that you can enter it later in the address bar of your web browser.

NOTE: The device may only be configured in secure networks!

NOTE: Please ensure that your PC or laptop is in the same subnet as the IPQ BOX!The subnet mask of the IPQ BOX is set to 255.255.205.0 in the factory default setting. The connected PC/laptop must therefore be assigned an IP address with the following structure:192.168.1.xx.yy (where the digits xx depend on the MAC address) Netmask: /24/24

You can now begin configuration via the web browser user interface.

General information about the structure of the web browser interface

The configuration interface is divided into the following sections:

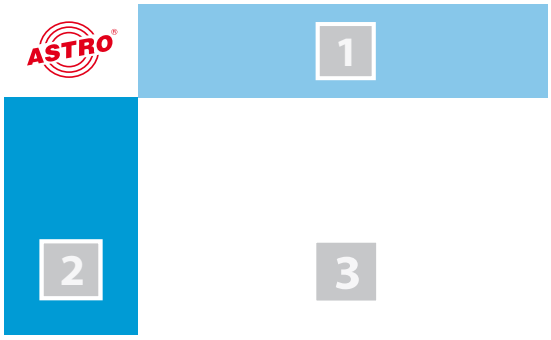


Figure 6: Structure of the websurface

- **Status bar (header) [1]:** displays general information about the module.
  SW: Software version
  HW: Hardware version
  Up: Runtime since system boot
  Time: Date and time
  Name, location, contact: corresponds to the settings made in the configuration area Status bar (header)
- **Navigation menu [2]:** shows the individual configuration areas, which you can select with a mouse click. A detailed explanation of these areas can be found on the following pages of this chapter.
- **Content area [3]:** Depending on the selected menu item, the respective configuration form is displayed here.

Logging in

To log in, first enter the IP address of the IPQ BOX in the address bar of your browser. This is:

192.168.1.200/24 (mgmt a) or
192.168.5.200/24 (mgmt b)

The ‘Status’ menu page will then be displayed (see below).

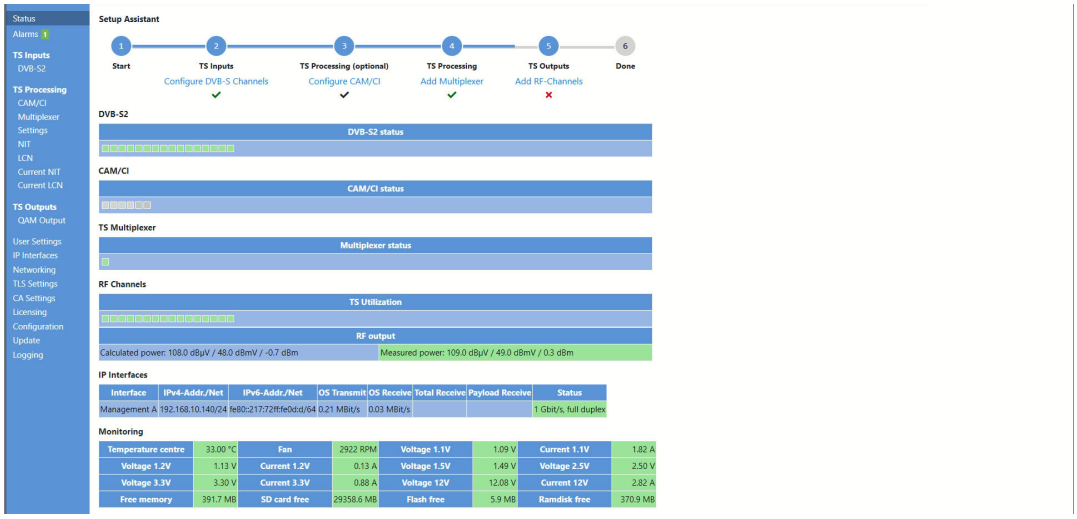
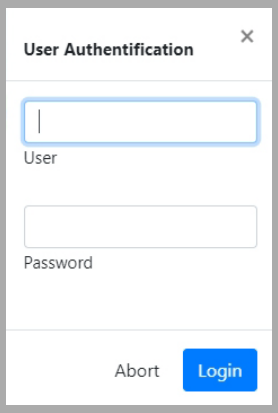


Figure 7: Status page

NOTE: The setup wizard is displayed at the top of the StatusPage. It provides an over-view of the current configuration status. Once the configuration is complete, it is hidden (see section ‘Status’).



Now click on the ‘Login’ button in the top right-hand corner of the configuration interface. You will now see the login screen (see left)..

Enter the following in the two input fields:

- **Username:** „user“ or „admin“ (Input without quotation marks)
- **Password:** astro

Finally, click on the ‘Login’ button to log in. After logging in, you will continue to see the IPQ BOX ‘Status’ menu page with the relevant system information. The login status is displayed at the top right, and the navigation menu is located on the left-hand page.

Only one user can be logged into the IPQ BOX user interface at a time. The current user is displayed in the top right-hand corner.

The status of the device is indicated by a green or red box next to the first menu item, ‘Alarms’. Here you will find the number of messages. The colour depends on the alarm level. If a green box is displayed, the device is ready for operation. If the circle is red, there is a fault.

A list of current errors is available under the menu item ‘Alarms’.

NOTE: For security reasons, you should change the default login details (username and password) to prevent unauthorised access!
You can find out how to do this in the following section, “Changing user details”.

Change user data

Click on the ‘User Settings’ menu item in the menu on the left to display the corresponding input mask. You will now see the input mask from Figure 8.

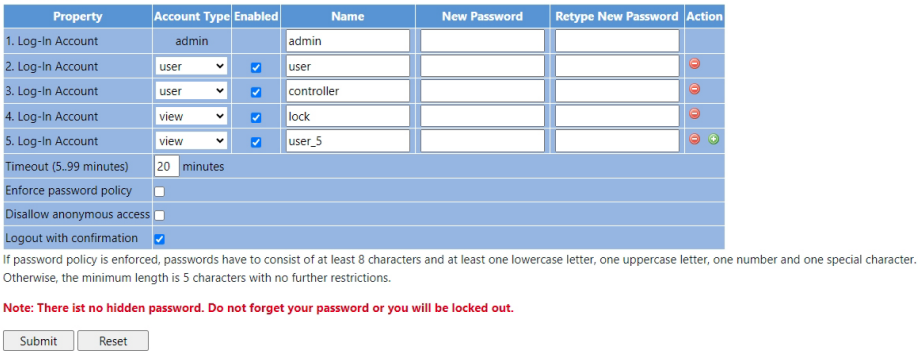


Figure 8: User management

You can create up to four users for the device's user interface. The following three users are created in the factory default settings:

- user
- admin
- controller

The password for all three users is ‘astro’.
To change or create the access data for a user account, type in the desired user name into the input field `Name`. Type the desired password into the input field `New Password` and for confirmation into the input field `Retype New Password`.

NOTE: A password must have a minimum length of 5 characters!

To delete a user account, click on the minus sign in the right-hand column of the table.
You can also configure the following settings:

- `Timeout:` In this input field, you can enter a period of time in minutes for automatic logout. If no further input is made in the user interface, automatic logout will occur after the time entered here has elapsed. The time remaining until automatic logout is displayed below the menu in the left-hand column.
- `Enforce password policy:` Select this checkbox if additional rules apply to the selection of a password (at least 8 characters long, must contain both upper and lower case letters, at least one number and at least one special character). If this option is not selected, a password must only be 5 characters long.
- `Disallow anonymous access:` Tick this box if you wish to prevent unauthorised access.
- `Logout with confirmation:` If you tick this box, you will be asked to confirm the logout once more after clicking the logout button at the top right of the screen.

IMPORTANT: All changes will only take effect after you have clicked on the ‘Apply’ button below the input mask! Click on the ‘Reset entries’ button to delete the values you have entered.

Adjusting IP addresses

NOTE: If the IP address is changed, the PC settings must also be adjusted accordingly. IP addresses can only be changed by the administrator!

To adjust the IP addresses of the management, click on the 'IP Interfaces' entry in the main menu on the left. You will now see the following table in the content area:

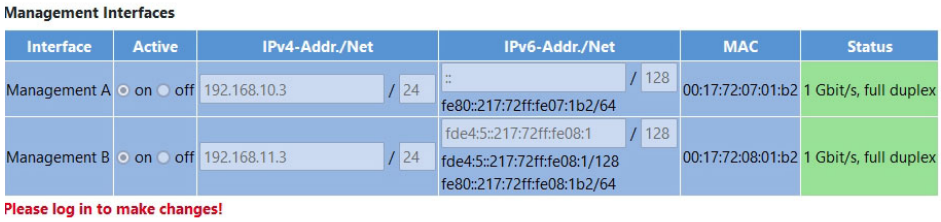


Figure 9: adjusting IP addresses

In the 'Management Interfaces' table, you can enter the IP addresses for the two management ports. Make sure that you activate the ports used by selecting the corresponding radio button in the 'Active' row.

Click the 'Apply' button at the top right of the interface to save changes.
Click 'Discard' to restore the original settings.

Configure DVB-S2 satellite receivers

Now start configuring a signal path in the IPQ BOX. To do this, first click on the 'DVB-S2' entry in the 'TS Inputs' section of the main menu on the left and then select the 'Input Settings' entry in the menu at the top. You will now see the following tables in the content area:

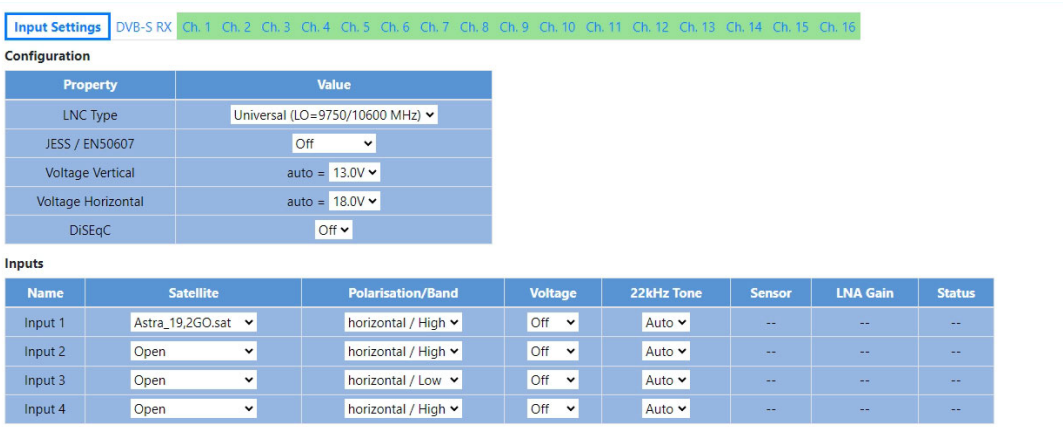
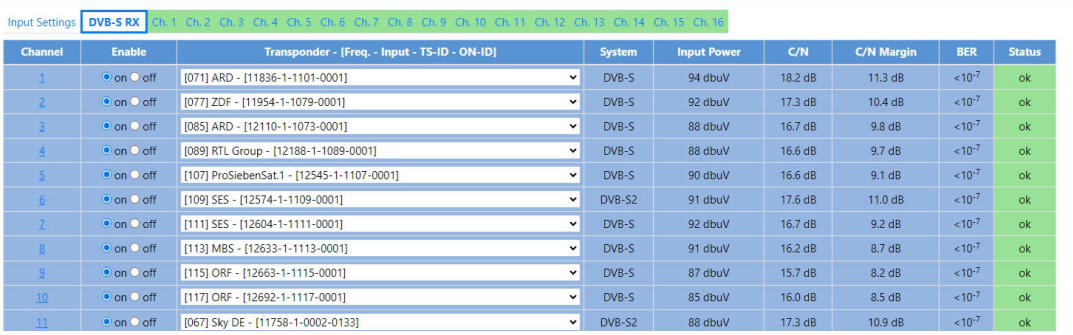


Figure 10: selecting a received signal

In the 'Inputs' table, select the desired satellite (e.g. ASTRA, Eutelsat, etc.) from the "Satellite" drop-down list. In the 'Polarisation/Band' column, you can select the desired polarisation plane from the drop-down list.
Select a supply voltage for the LNB from the 'Voltage' drop-down list.If you want to use 22 kHz pulse control: Select 'auto' from the '22 kHz Tone' drop-down list, and it will be set automatically for the selected level. Alternatively, you can also enter a fixed value. Select 'off' to switch off pulse control.

Click the 'Apply' button at the top right of the interface to save changes.
Click 'Discard' to restore the original settings.

Now click on the ‘DVB-S RX’ entry in the submenu at the top to assign a transponder to the first reception channel (Ch 1.1) as an example.



Channel	Enable	Transponder - [Freq. - Input - TS-ID - ON-ID]	System	Input Power	C/N	C/N Margin	BER	Status
1	on off	[071] ARD - [11836-1-1101-0001]	DVB-S	94 dbuV	18.2 dB	11.3 dB	<10^{-7}	ok
2	on off	[077] ZDF - [11954-1-1079-0001]	DVB-S	92 dbuV	17.3 dB	10.4 dB	<10^{-7}	ok
3	on off	[085] ARD - [12110-1-1073-0001]	DVB-S	88 dbuV	16.7 dB	9.8 dB	<10^{-7}	ok
4	on off	[089] RTL Group - [12188-1-1089-0001]	DVB-S	88 dbuV	16.6 dB	9.7 dB	<10^{-7}	ok
5	on off	[107] ProSiebenSat.1 - [12545-1-1107-0001]	DVB-S	90 dbuV	16.6 dB	9.1 dB	<10^{-7}	ok
6	on off	[109] SES - [12574-1-1109-0001]	DVB-S2	91 dbuV	17.6 dB	11.0 dB	<10^{-7}	ok
7	on off	[111] SES - [12604-1-1111-0001]	DVB-S	92 dbuV	16.7 dB	9.2 dB	<10^{-7}	ok
8	on off	[113] MBS - [12633-1-1113-0001]	DVB-S	91 dbuV	16.2 dB	8.7 dB	<10^{-7}	ok
9	on off	[115] ORF - [12663-1-1115-0001]	DVB-S	87 dbuV	15.7 dB	8.2 dB	<10^{-7}	ok
10	on off	[117] ORF - [12692-1-1117-0001]	DVB-S	85 dbuV	16.0 dB	8.5 dB	<10^{-7}	ok
11	on off	[067] Sky DE - [11758-1-0002-0133]	DVB-S2	88 dbuV	17.3 dB	10.9 dB	<10^{-7}	ok

Figure 11: Transponder settings

Select the desired transponder for channel 1.1 from the selection list.

Click the ‘Apply’ button at the top right of the interface to save changes.
Click ‘Discard’ to restore the original settings.

Checking the transponder status

Now click on the entry ‘Ch. 1’ in the submenu on the left. You will now see the following overviewt:

SAT RX 1.1 Settings

Property	Value			
Input	4 - Astra_19,2GO.sat - horizontal / High			
Transponder	ARD Digital1 (TP071)			
Manual Settings	Frequency	Symbol Rate	TS-ID	ON-ID
	11836 MHz	27500 kBaud	1101 dec.	1 dec.
Status	ok			

Submit Reset Form

SAT RX 1.1 Status

Alias	ARD Digital1 (TP071)
Input	4
Status	locked
Standard	DVB-S
Tuned IF-Frequency	1235074 kHz
SAT-Frequency	11835074 kHz
TSID / ONID	1101 / 1
Demod. Power	-55 dBm

Figure 12: Displaying the transponder status

The message ‘OK’ should now be visible in the “Status” row of the ‘SAT RX 1.1 Settings’ table. Now check the most important parameters in the following ‘SAT RX 1.1 Status’ table.
In particular, check the values in the ‘Quality’, ‘Tuner Level’ and ‘C/N’ rows. Channel information with TS information is displayed on the right.

Adjusting the signal routing to the CAM modules

Now insert the required CI module into the first slot of the device, if you have not already done so. Proceed as described in the section ‘Connecting and mounting the module’.

In the main menu on the left, click on the ‘CAM/CI’ entry in the ‘TS Processing’ section and then select the ‘CAM/CI Settings’ entry in the submenu at the top. You will now see the following table:

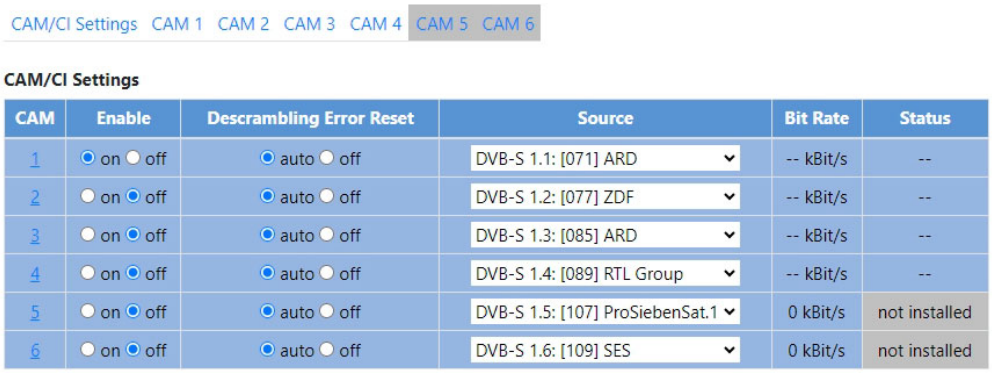


Figure 13: Signal routing to the CAM modules

Activate a CAM module by clicking the ‘On’ radio button in the “Enable” column. Now select the desired receiver to be connected to the CAM module in the ‘Source’ column.

To save your changes, click on the ‘Submit’ button below the table.

Now click on the ‘CAM 1’ entry in the submenu at the top. You will now see the following table:

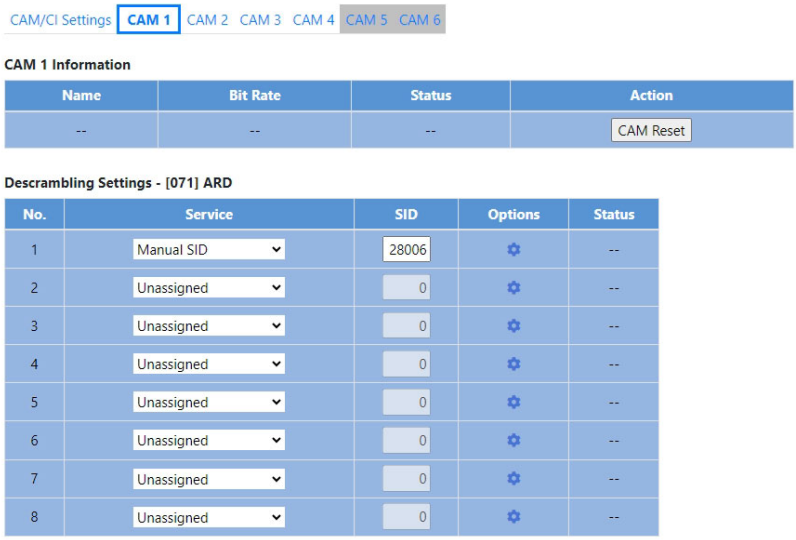


Figure 14: CAM settings

The ‘Descrambling Settings’ table shows a list of the individual services received by the CAM 1 module. You can select a service to be decrypted in the ‘Service’ column. To add a service, click on the plus sign in the right-hand column.

For more information on setting up decryption, see the section ‘Setting up decryption’.

If decryption is successful, green text will appear in the status column.

Check reception data rate

Now click on the ‘Status’ entry in the main menu on the left. You will now see the following overview:

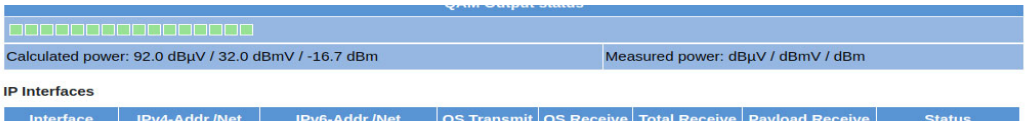


Figure 15: Display reception statistics

In the ‘IP Interfaces’ table, the ‘Payload Receive’ line should now display a receive data rate > 0, which is present on data ports A, B, C and D respectively.

NOTE: The device only has two optional data ports, which are not intended for data reception for the IPQ BOX 16. Only the management interfaces are displayed..

Configure HF output channels

First, set the desired number of output channels, the maximum overall level and the channel grid. To do this, click on the ‘QAM Output’ entry in the ‘TS Outputs’ section of the main menu on the left. Then select the ‘RF Settings’ entry in the submenu at the top. You will now see the following table:

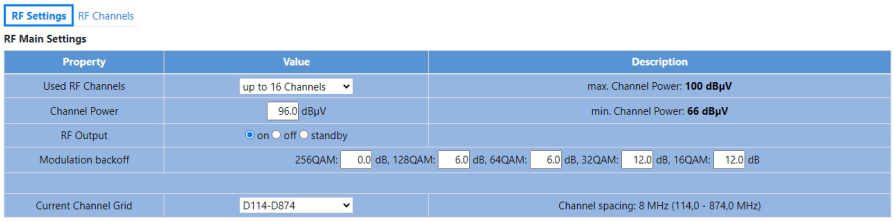


Figure 16: Table „RF Main Settings“

In the ‘Used RF channels’ line, you can select the desired value from the drop-down list in the ‘Value’ column. In the ‘Channel Power’ row, you can enter the desired level in the input field. In the ‘Current Channel Grid’ row, you can select the desired channel grid from the drop-down list. If the channel grid you want is not available, please contact our customer service.

Click the ‘Apply’ button at the top right of the interface to save changes.

Click ‘Discard’ to restore the original settings.

Finally, you should configure and activate the HF output channels. To do this, click on the ‘RF Channels’ entry in the submenu at the top. You will now see the following table:

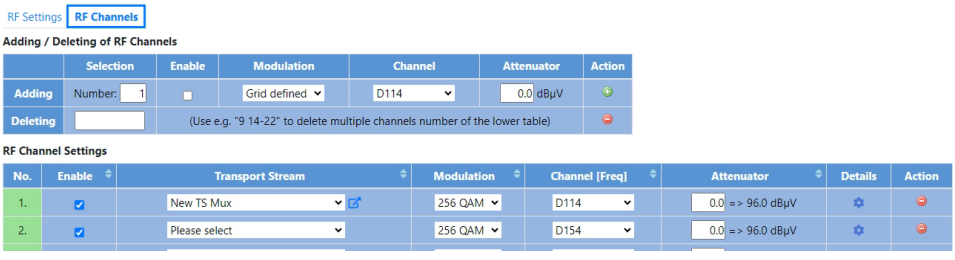


Figure 17: Configuring RF output channels

Add a channel as an example by selecting a value for QAM modulation from the ‘Modulation’ drop-down list in the ‘Adding / Deleting of RF Channels’ table and then selecting a channel frequency from the “Channel” drop-down list. Now activate the ‘Enable’ checkbox and click on the plus sign. The channel should now be listed in the RF Channel Settings table. You must then select the desired transport stream.

Click the ‘Apply’ button at the top right of the interface to save changes.
Click ‘Discard’ to restore the original settings.

Menu „Alarms“

To view current error messages, click on the ‘Alarms’ entry in the menu on the left. You will then see the following table:

Active Alarm Table

Time	Component	Severity	Message
2024-11-19 09:17:40+00:00	Update.BackupDiffers	notice	Backup software differs

Figure 19: Active Alarm Table

The table provides information about currently available error messages. The ‘Message’ column displays the plain text of the error message.

HINWEIS: You can also access the ‘Active Alarm Table’ menu by clicking on the red dot in the status bar at the top of the user interface.

Menu „Status“

To display the current settings for the IPQ BOX, click on `Status` in the main menu on the left. You will now see the overview shown below:

Setup Assistant

1	2	3	4	5	6
Start	TS Inputs	TS Processing (optional)	TS Processing	TS Outputs	Done
	Configure DVB-S Channels	Configure CAM/CI	Add Multiplexer	Add RF-Channels	
	✓	✓	✓	✗	

TS Inputs

DVB-S2 status

TS Processing

CAM/CI status

Multiplexer status

TS Outputs

QAM Output status

Calculated power: 92.0 dBµV / 32.0 dBmV / -16.7 dBm | Measured power: dBµV / dBmV / dBm

IP Interfaces

Interface	IPv4-Addr./Net	IPv6-Addr./Net	OS Transmit	OS Receive	Total Receive	Payload Receive	Status
Management A	192.168.10.163/24	fe80::217:72ff:fe0d:e/64	0.13 MBit/s	0.03 MBit/s			1 Gbit/s, full duplex

Monitoring

Temperature centre	29.56 °C	Fan	2922 RPM	Voltage 1.1V	1.09 V	Current 1.1V	2.03 A
Voltage 1.2V	1.17 V	Current 1.2V	0.13 A	Voltage 1.5V	1.50 V	Voltage 2.5V	2.49 V
Voltage 3.3V	3.32 V	Current 3.3V	0.70 A	Voltage 12V	12.10 V	Current 12V	3.11 A
Free memory	372.8 MB	SD card free	28592.8 MB	Flash free	3.9 MB	Ramdisk free	368.5 MB

Figure 20: Status display

NOTE: The setup wizard is located at the top of the status overview. It shows which areas of the device have already been configured (green tick). Areas marked with a red cross still need to be configured. Once configuration is complete, the setup wizard will no longer be displayed.

The following tables are displayed:

Status display of DVB-S2 reception channels:

Figure 21: Status display - TS Inputs

In the ‘DVB-S2’ table, the reception channels routed to a data port are each represented by a square. Depending on the status of a channel, the square appears either green (no errors) or red (errors present). When the mouse pointer is placed over one of the squares, a pop-up window appears with information about the respective channel. In the event of an error, several parameters may also be displayed.

Status display of CAM modules:

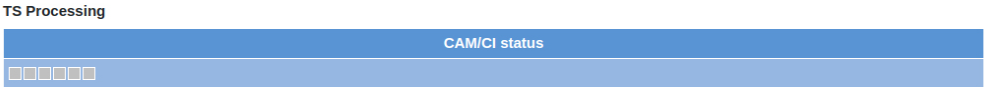


Figure 22: Status display - TS Processing

In the ‘TS Processing’ table, individual CAM modules are represented by a square under ‘CAM/CI status’. Depending on the status of a module, the square appears either green (active) or red (inactive). When the mouse pointer is hovered over one of the squares, a pop-up window appears with additional information. In the event of an error, several parameters may also be displayed.

Status display of TS multiplexers:

Figure 23: Status display - Multiplexer status

In the ‘TS Processing’ table, multiplexers set up in the ‘Multiplexer status’ area are each represented by a square. Depending on the status of a multiplexer, the square appears either green (active) or red (inactive). When the mouse pointer is hovered over one of the squares, a pop-up window appears with additional information. In the event of an error, several parameters may also be displayed.

Status display of RF output channels:

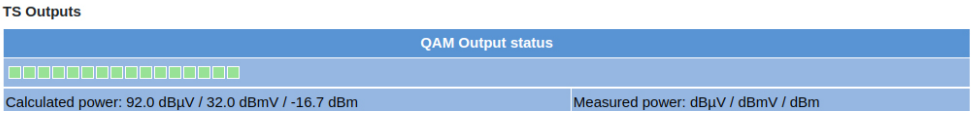


Figure 24: Status display - QAM output status

In the ‘TS Outputs’ table, the QAM output channels are each represented by a square. Depending on the status of a channel, the square appears either green (no errors) or red (errors present). When the mouse pointer is placed over one of the squares, a pop-up window appears with information about the respective channel. Specifically, this includes:

- `RF Channel:` Channel frequency
- `Max. data rate:` maximum transmission rate (Used + Null)
- `Used data rate:` Payloadt
- `Null data rate:` Zero packets
- `Utilization:` Used data rate / Max data rate (in %)

NOTE: Inactive channels are grayed out!

The bottom line also contains the following information:

- `Calculated power:` calculated output power (specified in dBµV)
- `Measured power:` Output power measured at the RF jack (specified in dBµV)

Configuration data and status of the IP interfaces:

IP Interfaces

Interface	IPv4-Addr./Net	IPv6-Addr./Net	OS Transmit	OS Receive	Total Receive	Payload Receive	Status
Management A	192.168.10.163/24	fe80::217:72ff:fe0d:e/64	0.13 MBit/s	0.03 MBit/s			1 Gbit/s, full duplex

Figure 25: Status display - IP Interfaces

Depending on the connections on the front panel of the IPQ BOX (Data A, Data B, Management A and Management B, see section ‘Device description’), the values for the following parameters are displayed or set here:

- `Interface:` Management port
- `IPv4-Addr./Net:` IPv4 Address (left field) / Subnet (right field)
- `IPv6-Addr./Net:` additionally supported: IPv6 Address (left field) / Net (right field)
- `OS Transmit:` Data rate in transmission direction, generated by the operating system
- `OS Receive:` Data rate in the receiving direction, generated by the operating system
- `Total Receive:` Total gross data rate in the receiving direction (OS + payload)
- `Payload Receive:` Net data rate in the receiving direction
- `Status:` disabled (off) or active (transfer rate is displayed); for 1000base-x SFP modules, this is only the link to the module

Status messages for monitoring:

Monitoring

Temperature centre	29.56 °C	Fan	2922 RPM	Voltage 1.1V	1.09 V	Current 1.1V	2.03 A
Voltage 1.2V	1.17 V	Current 1.2V	0.13 A	Voltage 1.5V	1.50 V	Voltage 2.5V	2.49 V
Voltage 3.3V	3.32 V	Current 3.3V	0.70 A	Voltage 12V	12.10 V	Current 12V	3.11 A
Free memory	372.8 MB	SD card free	28592.8 MB	Flash free	3.9 MB	Ramdisk free	368.5 MB

Figure 26: Status display - Monitoring

The ‘Monitoring’ table allows you to monitor a range of hardware functions. Specifically, these are:

- `Temperature center:` Temperature display in °C for mainboard
- `Fan:` Fan rotation speed
- `Voltage XX:` Supply voltage XX in Volt
- `Current XX:` Current in A of the corresponding supply voltage
- `Free memory:` Free storage space
- `SD card free:` Free storage space on SD card
- `Flash free:` Fee storage space on flash memory
- `Ramdiskfree:` Free RAM memory

Menu „DVB-S2“

To display the reception settings for the device's four SAT inputs, click on the ‘DVB-S2’ entry in the main menu on the left and then select the ‘Input Settings’ entry in the submenu at the top.

LNB and DiSEqC settings

In the upper table ‘Configuration’, you can configure the settings for the power supply unit used.

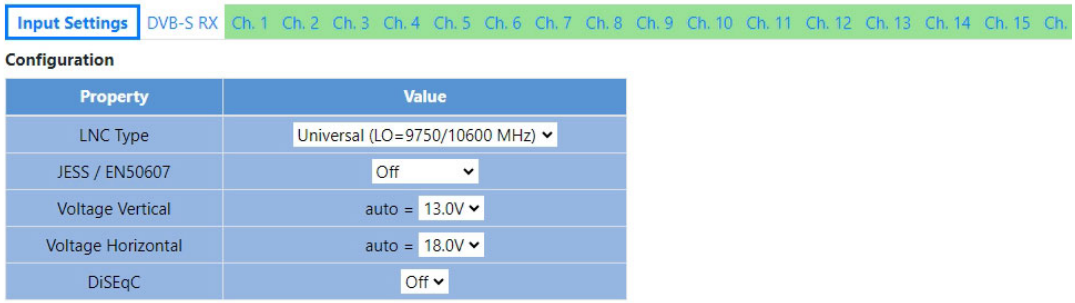


Figure 27: Table „Configuration“

Here you can adjust the following parameters:

- `LNC Type:` Select the type of LNB used (universal or Quatro switch) from the drop-down list. If you are using an LNB with a different LO frequency, select the entry ‘LO = manual input’.
- `Voltage Vertical:` Select the LNB voltage for vertical polarisation (used when the ‘Voltage’ parameter in the ‘Input Settings’ table is set to ‘auto’).
- `JESS / EN50607:` Select from the drop-down list whether inputs 1 or 1 and 2, 1 to 3, 1 to 4 or none of the inputs should be operated in JESS mode in order to connect JESS-compatible LNBs or multiswitches to the device.
- `Voltage Horizontal:` Select the LNB voltage for horizontal polarisation (used when the ‘Voltage’ parameter in the ‘Input Settings’ table is set to ‘auto’).
- `DiSEqC:` If you are using a receiver with DiSEqC control, select “On” from the drop-down list. If you are not using DiSEqC control, select “Off”.

Click the ‘Apply’ button at the top right of the interface to save changes.
Click ‘Discard’ to restore the original settings.

Satellite settings

In der Tabelle „Input Settings“ können Sie Einstellungen zur Auswahl des empfangenen Satelliten vornehmen.

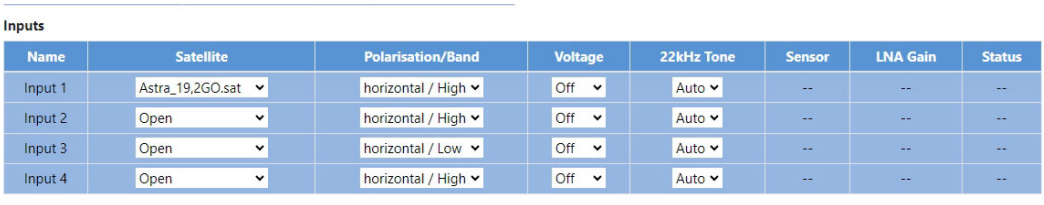


Figure 28: Tabe „Input Settings“

Here you can configure the following parameters for each of the four SAT inputs:

- `Satellite:` Select the desired satellite (e.g. ASTRA, Eutelsat, etc.) from the drop-down list. If an input is configured for JESS mode via the ‘Configuration’ table (target JESS), you can select a satellite for each of the positions A to H.
- `Polarisation/Band:` Select the desired polarisation plane from the drop-down list.
- `Voltage:` Select the desired supply voltage.
- `22 kHz Tone:` Use the drop-down list to select whether 22 kHz pulse switching should be enabled. If you activate ‘Auto’, the 22 kHz tone is automatically activated in the high band.
- `Sensor:` measured LNB supply voltage/current
- `LNA Gain:` Gain of Low Noise Amplifier
- `Status:` Status display of input

Click the ‘Apply’ button at the top right of the interface to save changes.
Click ‘Discard’ to restore the original settings.

Selecting a transponder for a reception channel

In the ‘DVB-S RX Settings’ table, you can select a transponder for each of the four reception channels.

Input Settings | DVB-S RX | Ch. 1 Ch. 2 Ch. 3 Ch. 4 Ch. 5 Ch. 6 Ch. 7 Ch. 8 Ch. 9 Ch. 10 Ch. 11 Ch. 12 Ch. 13 Ch. 14 Ch. 15 Ch. 16

Channel	Enable	Transponder - [Freq. - Input - TS-ID - ON-ID]	System	Input Power	C/N	C/N Margin	BER	Status
1	on off	[071] ARD - [11836-1-1101-0001]	DVB-S	94 dbuV	18.2 dB	11.3 dB	<10^{-7}	ok
2	on off	[077] ZDF - [11954-1-1079-0001]	DVB-S	92 dbuV	17.3 dB	10.4 dB	<10^{-7}	ok
3	on off	[085] ARD - [12110-1-1073-0001]	DVB-S	88 dbuV	16.7 dB	9.8 dB	<10^{-7}	ok
4	on off	[089] RTL Group - [12188-1-1089-0001]	DVB-S	88 dbuV	16.6 dB	9.7 dB	<10^{-7}	ok
5	on off	[107] ProSiebenSat.1 - [12545-1-1107-0001]	DVB-S	90 dbuV	16.6 dB	9.1 dB	<10^{-7}	ok
6	on off	[109] SES - [12574-1-1109-0001]	DVB-S2	91 dbuV	17.6 dB	11.0 dB	<10^{-7}	ok
7	on off	[111] SES - [12604-1-1111-0001]	DVB-S	92 dbuV	16.7 dB	9.2 dB	<10^{-7}	ok
8	on off	[113] MBS - [12633-1-1113-0001]	DVB-S	91 dbuV	16.2 dB	8.7 dB	<10^{-7}	ok
9	on off	[115] ORF - [12663-1-1115-0001]	DVB-S	87 dbuV	15.7 dB	8.2 dB	<10^{-7}	ok
10	on off	[117] ORF - [12692-1-1117-0001]	DVB-S	85 dbuV	16.0 dB	8.5 dB	<10^{-7}	ok
11	on off	[067] Sky DE - [11758-1-0002-0133]	DVB-S2	88 dbuV	17.3 dB	10.9 dB	<10^{-7}	ok
12	on off	[069] Sky DE - [11798-1-0016-0133]	DVB-S2	89 dbuV	17.0 dB	10.6 dB	<10^{-7}	ok
13	on off	[075] Sky DE - [11914-1-0006-0133]	DVB-S2	92 dbuV	17.4 dB	11.0 dB	<10^{-7}	ok
14	on off	[079] Sky DE - [11992-1-0013-0133]	DVB-S2	86 dbuV	16.0 dB	9.6 dB	<10^{-7}	ok
15	on off	[081] Sky DE - [12032-1-0004-0133]	DVB-S2	85 dbuV	15.1 dB	8.7 dB	<10^{-7}	ok
16	on off	[099] Sky DE - [12382-1-0011-0133]	DVB-S2	89 dbuV	17.0 dB	9.1 dB	<10^{-7}	ok

Figure 29: Table „DVB-S RX“

In the ‘Transponder - [Freq. - Input - TS-ID - ON-ID]’ column, select the desired transponder from the drop-down list.
In the ‘Enable’ column, you can activate the reception channel by clicking the ‘on’ radio button.
The entries in the list are grouped according to the satellites selected in the ‘Input Settings’ table.
The ‘Input Settings’ table shows the satellite settings for the selected transponder.

To configure the transponder details, click on one of the entries Ch 1 - Ch 16 in the submenu at the top. You will then see the following table in the content area:

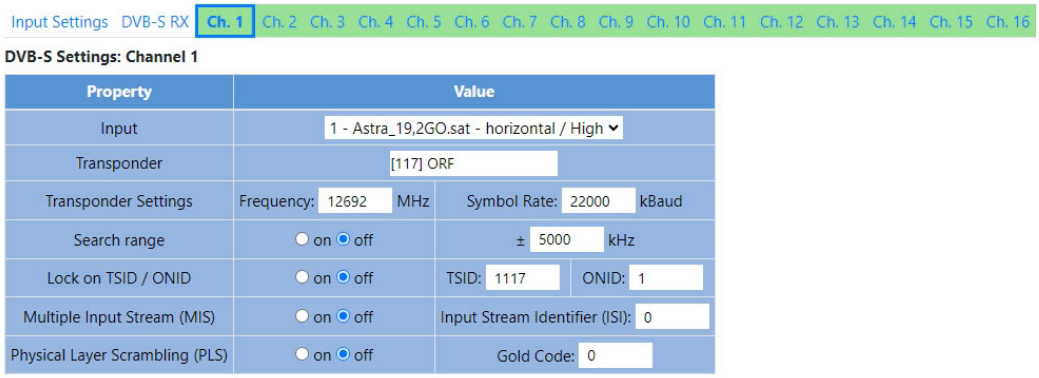


Figure 30: Table „DVB-S Settings: Channel X“

You can configure the following settings in detail:

- `Input:` Select the desired input from the selection list.
- `Transponder:` Select the desired transponder from the drop-down list.
- `Transponder Settings:` Enter the desired frequency and symbol rate in the input fields.
- `Search Range:` Activate the function by clicking the ‘On’ radio button. Enter the desired range in kHz in the input field.
- `Lock on TSID/ ONID:` Activate the function by clicking on the ‘On’ radio button. Enter the TSID and ONID in the respective input fields.
- `Multiple Input Streams:` Activate the function by clicking the ‘On’ radio button. Enter the desired value for the Input Stream Identifier (ISI) in the input field.
- `Physical Layer Scrambling:` Activate the function by clicking on the ‘On’ radio button. Enter the desired value for the Gold Code in the input field.

Below you will see a status table with all current values for the DVB-S parameters:

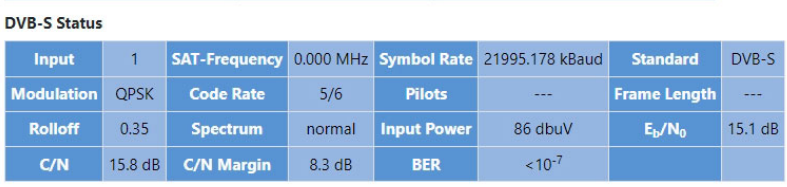


Figure 31: Table „DVB-S Status“

Click the ‘Apply’ button at the top right of the interface to save changes.
Click ‘Discard’ to restore the original settings.

Menu „CAM/CI“

In the main menu on the left, click on the ‘CAM/CI’ entry in the ‘TS Processing’ section and then select the ‘CAM/CI Settings’ entry in the submenu at the top. You will now see the following table:

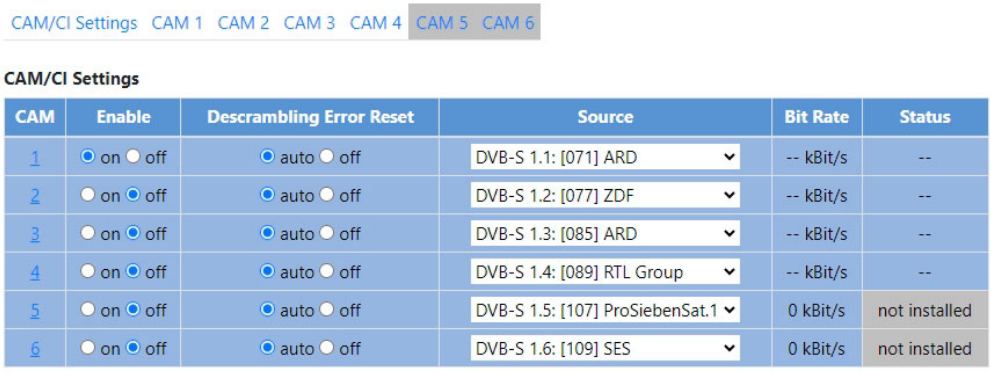


Figure 32: Signal routing to the CAM modules

Activate a CAM module by clicking the ‘On’ radio button in the “Enable” column. Now select the desired receiver to be connected to the CAM module in the ‘Source’ column.

To save your changes, click on the ‘Submit’ button below the table.

Now click on the ‘CAM 1’ entry in the submenu at the top. You will now see the following table:

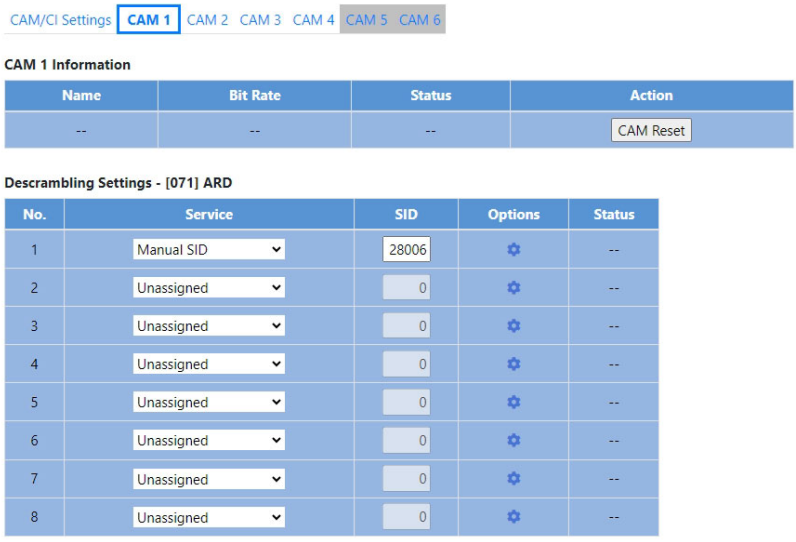


Figure 33: CAM settings

The ‘Descrambling Settings’ table shows a list of the individual services received by the CAM 1 module. You can select a service to be decrypted in the ‘Service’ column. To add a service, click on the plus sign in the right-hand column.

For more information on setting up decryption, see the section ‘Setting up decryption’.

If decryption is successful, green text will appear in the status column.

Click the ‘Apply’ button at the top right of the interface to save changes.

Click ‘Discard’ to restore the original settings.

Menu „Multiplexer“

If desired, you can compile new transport streams from different sources (IP interfaces) and create redundancies for them. To do this, first click on the ‘Multiplexer’ entry in the main menu on the left in the ‘TS Processing’ area. You will then see the TS Multiplexer Outputs table at the top of the content area:

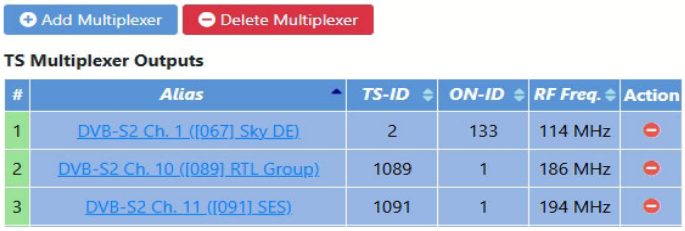


Figure 34: Table „TS Multiplexer Outputs“

You can use the buttons above the table (‘Add Multiplexer’, ‘Delete Multiplexer’) to create or delete new transport streams and/or redundancies. Each newly added TS multiplexer is shown schematically as in the image above. Within each redundancy, you can add any services from transport streams to a previously created priority level via ‘Service Drop’ or ‘Service Pass’. Additional priority levels are then displayed from left to right. Multiplexing is then performed by adding further redundancies. These can be configured in the same way as described above.

Adding and deleting a new tansport stream multiplexer

Use the ‘Add Multiplexer’ button above the ‘TS Multiplexer Outputs’ table to create one or more new multiplexers. You will then see the following input mask:

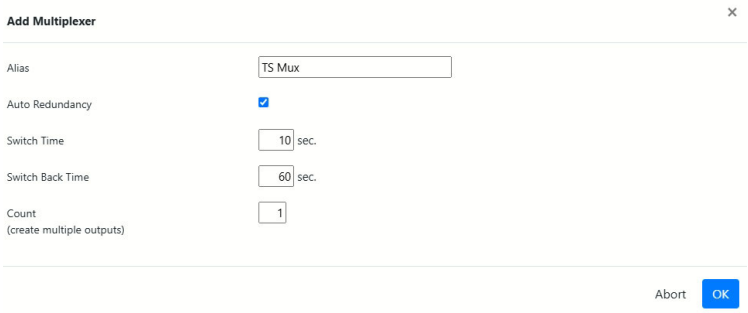


Figure 35: „Add Multiplexer“

To do this, first enter a name for the multiplexer in the ‘Alias’ input field. Select the ‘Auto Redundancy’ checkbox if you want automatic redundancy for the multiplexer. In the ‘Switch Time’ input field, you can enter a time value in seconds after which the redundancy circuit is activated in the event of a fault. You can also specify a time value in the ‘Switch Back Time’ input field after which the system will switch back to a higher priority. Finally, enter the desired number of outputs in the ‘Count’ input field.

Once you have made these entries, click on the ‘OK’ button at the bottom right. If you want to discard your entries, click on the ‘Abort’ button.

You can delete previously created multiplexers using the ‘Delete Multiplexer’ button.

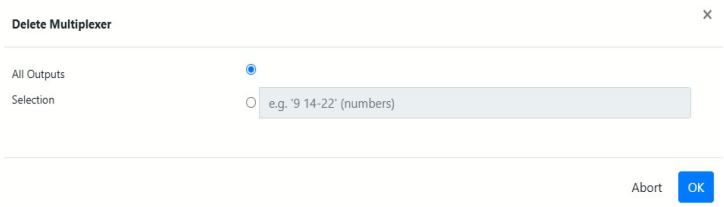


Figure 36: „Delete Multiplexer“

To do this, enter the number of the multiplexer assigned to it in the ‘TS Multiplexer Outputs’ table (first column) in the ‘Selection’ input field. You can also specify a range, e.g. 9 - 22 or similar. To delete the multiplexers, click on the ‘OK’ button. To discard your entries, click on the ‘Abort’ button.

Configuring a multiplexer

To configure detailed settings for the individual multiplexers, use the ‘TS Multiplexer Outputs’ table. Here you will find an overview of the parameters previously entered for the respective multiplexer.

TS Multiplexer Outputs

#	Alias	TS-ID	ON-ID	RF Freq.	Action
1	DVB-S2 Ch. 1 ([067] Sky DE)	2	133	114 MHz	
2	DVB-S2 Ch. 10 ([089] RTL Group)	1089	1	186 MHz	
3	DVB-S2 Ch. 11 ([091] SES)	1091	1	194 MHz	
4	DVB-S2 Ch. 12 ([095] Sky DE)	12	133	202 MHz	

Figure 37: Tabe „TS Multiplexer Outputs“

To open the detailed overview of a TS multiplexer, click on its alias name. The following window will then open:

Figure 38: Detailed settings for the TS multiplexer

Click the ‘Apply’ button at the top right of the interface to save changes.
Click ‘Discard’ to restore the original settings.

NOTE: You can return to the multiplexer overview from the detailed settings view at any time by clicking on the ‘Return to Output overview’ link.

NOTE: An overview of the current output is displayed in the content area on the right:

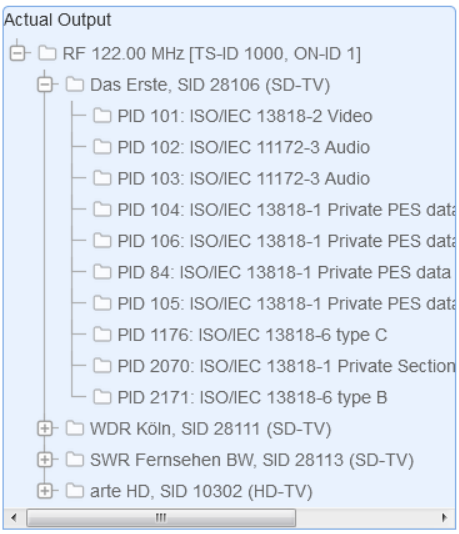


Figure 39: current outputs

Define output parameters for the multiplexer

The header summarises the multiplexer parameters you have specified so far.

Clicking on the cog icon in the top right-hand corner opens a window where you can specify the output parameters for the multiplexer. Enter the desired values in the corresponding input fields.
Clicking on the cog icon in the top right-hand corner opens a window where you can set the output parameters for the multiplexer. Enter the desired values in the corresponding input fields.

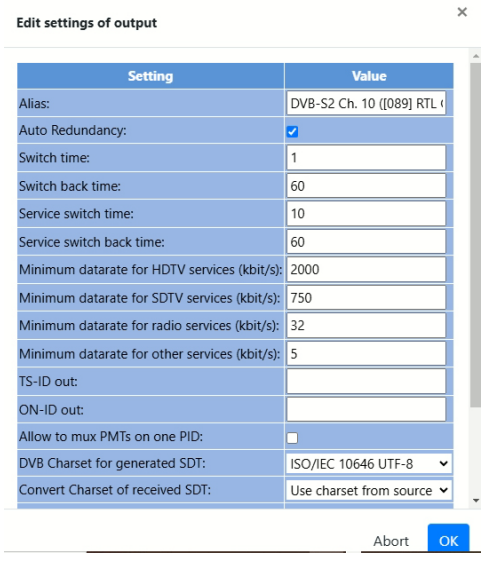


Figure 40: defining output parameters

If desired, you can also activate EIT processing by clicking the checkbox in the bottom row. If you activate EIT processing, you can set the following parameters using a selection field:

- `EIT Mode actual:` For this transport stream, select either ‘off’ to deactivate the function, ‘present following’ for the current and following channels, or ‘schedule’ to create a programme schedule.

- `Multiplexer channels for EIT other:` For other transport streams, select either ‘off’ to deactivate the function or ‘present_following’ for the current and following transmitters.
- `Multiplexer channels for EIT other:` Enter the multiplexer channels for the other transport streams.

Finally, click on ‘OK’ to save your entries or on ‘Abort’ if you wish to discard them. If you save the entries, they will also appear in the header.

NOTE: If you have enabled EIT processing, an additional icon will appear in the header.

Create redundancy

To create a redundancy, click on the plus sign in the header. You will then see the following entry below the header::

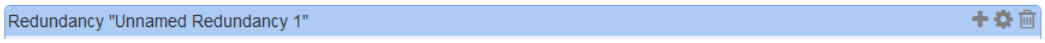


Figure 41: new redundancy

This is the header of the redundancy. Click on the cog icon here to open the redundancy properties window:

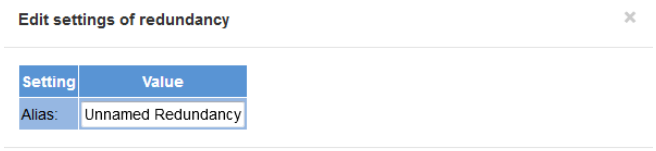


Figure 42: Redundancy properties window

Enter an alias name for the redundancy in the input field and click ‘OK’ to save your entry or ‘Abort’ to discard your entry.

You can delete a redundancy by clicking on the rubbish bin icon.

Inserting a redundancy group

Now click on the plus symbol in the header to create a new redundancy group. This will insert a new group within the redundancy. You will now see the following entry below the redundancy header:

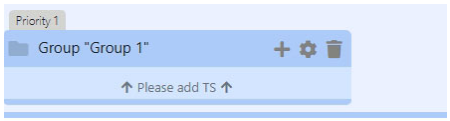


Figure 43: new redundancy group

NOTE: The active redundancy group (with the highest priority) is marked with a dashed line.

You can delete a redundancy group by clicking on the rubbish bin icon.

Click on the cog icon here to open the redundancy group properties window:

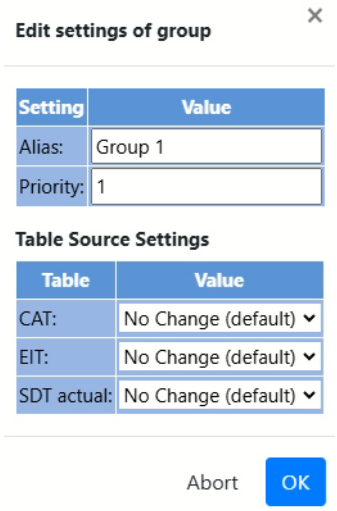


Figure 44: Redundancy group properties window

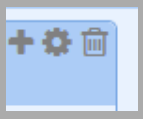
Enter an alias name for the redundancy group in the upper input field of the first table, ‘Edit settings of group’, and enter a numerical value for the priority of the group in the lower input field (‘1’ corresponds to the highest priority, etc.).

Then, in the second table, ‘Table Source Settings’ for CAT, EIT and SDT actual, select a setting from the drop-down list (‘No Change’, ‘Multiple sources’ or ‘Single source’).

Then click ‘OK’ to save your entry or ‘Abort’ to discard your entries.

Insert a transport stream

Now add the desired transport stream within the group by clicking on the plus symbol in the header of the redundancy group. (You can delete the transport stream by clicking on the rubbish bin symbol.)



The following window will open: Now add a desired transport stream within the group by clicking on the plus symbol in the header of the redundancy group. (You can delete the transport stream by clicking on the rubbish bin symbol.)
The following window will open:

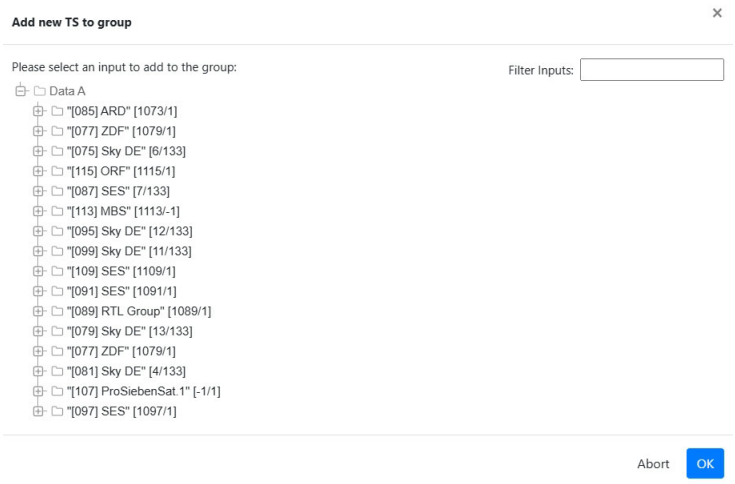


Figure 45: Window „Add new TS to group“

Select the transport stream from one of the four IP interfaces (Data A, Data B, etc.) by first clicking on the plus sign for the respective interface. The transport streams will then be listed. Select the transport stream and then click on ‘OK’ to confirm your selection or on ‘Abort’ to discard your selection.

Once you have selected a transport stream, it will be displayed below the header of the redundancy group:

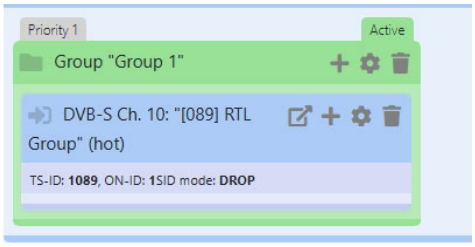
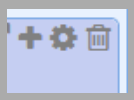


Figure 46: new transport stream in a redundancy group



Click on the cog icon for the current to configure the detailed settings for the transport current. You will now see the following window:

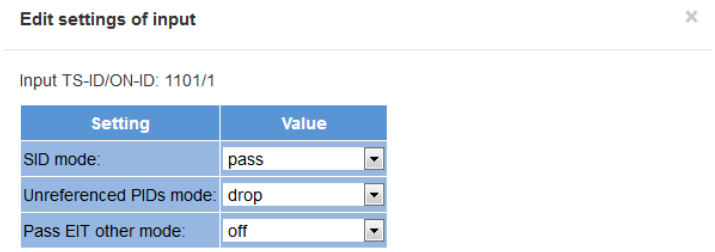
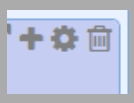


Figure 47: Window „Edit settings of input“

Here you can edit the following settings:

- `SID mode:` Select the ‘pass’ entry from the drop-down list if you want to use individual services in the transport stream. Select the ‘drop’ entry if you want to remove individual services from the transport stream.
- `Unreferenced PIDs mode:` Select the ‘pass’ entry from the drop-down list if you want to use individual unreferenced PIDs. Select the ‘drop’ entry if you want to remove individual PIDs.
- `Pass EIT other mode:` Select ‘present_following’ from the drop-down list if you want to activate the mode for the current and following channels. Select “schedule” if you want to create a programme schedule. Select ‘off’ if you want to deactivate EIT processing.

Finally, click on ‘OK’ to confirm your selection or on ‘Abort’ to discard your selection.



Filtering services and PIDs

You can now filter individual services or PIDs from the transport stream. To do this, first click on the plus symbol. You will now see the following window:

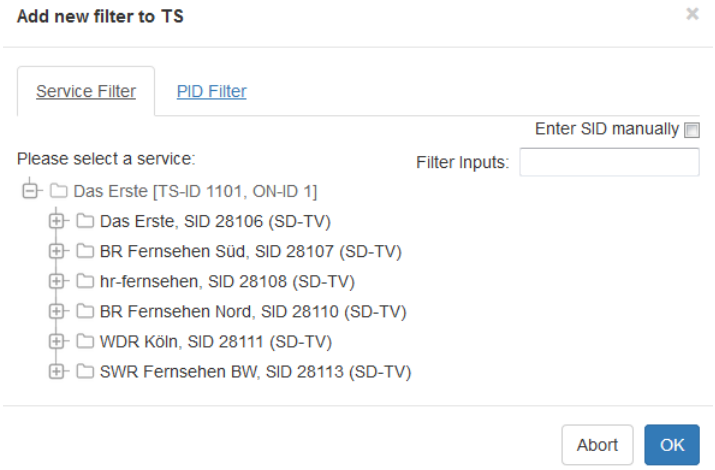


Figure 48: Window „Add new filter to TS“

Here, you can first select individual services from the transport stream. These are then either selected or removed from the stream according to the settings you previously made in the ‘Edit settings of input’ table.
You can also select individual SIDs manually by activating the checkbox at the top right and then entering the service in the input field.
If desired, you can then filter individual PIDs by first clicking on the ‘PID Filter’ tab. You will then see the following view:

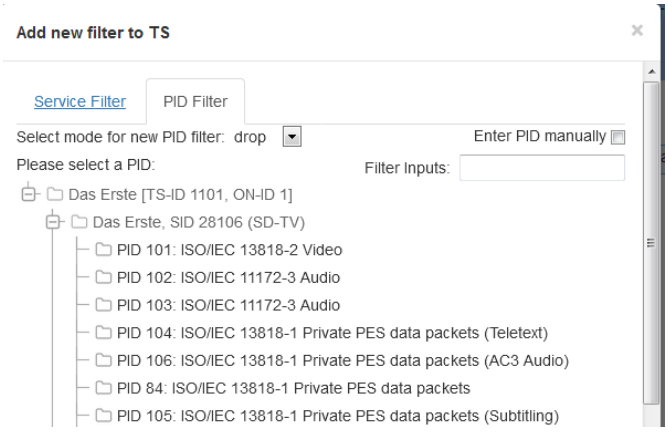


Figure 49: Window „Add new filter to TS - Reiter PID Filter“

Here you can select individual PIDs. These will then be either selected or removed from the stream according to the settings you previously made in the ‘Edit settings of input’ table.

You can also select individual PIDs manually by activating the checkbox at the top right and then entering them in the input field.

Finally, click on ‘OK’ to confirm your selection or on ‘Abort’ to discard your selection.

NOTE: To create additional redundancy groups, first click on the plus symbol in the header and then proceed as described above. Remember to set the priority level for each group.

To delete a redundancy group, click on the rubbish bin symbol.

Click the cog icon to display the properties window for service redundancy:

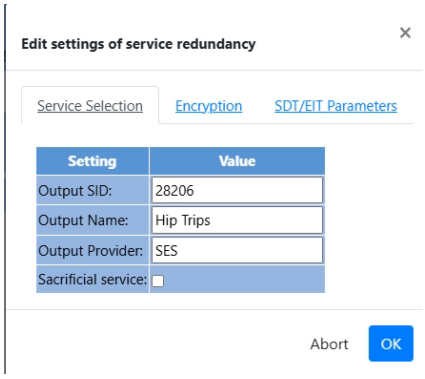


Figure 52: Window „Edit settings of service redundance - service selection“

Here, under the ‘Service Selection’ tab, you can make the following entries:

- `Output SID:` Enter the desired service ID in the input field.
- `Output name:` Enter the desired name in the input field.
- `Output provider:` Enter the desired provider name in the input field.
- `Sacrificial services:` Tick the checkbox if packets from this service are to be removed from the data stream when the channel capacity is exceeded.

When you select the ‘SDT/EIT Parameters’ tab, you will see the following table:

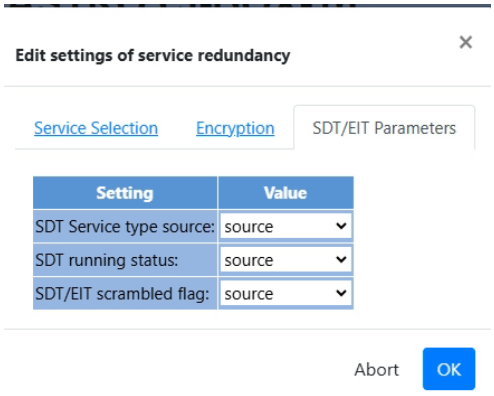


Figure 53: Window „Edit settings of service redundance - SDT/EIT Parameters“

Here you can make the following entries:

- `SDT Service type source:` Select an SDT service type from the drop-down list (source, detect or manual).
- `SDT running status:` Select the SDT status from the drop-down list (“source”, “detect”, “running” or “not running”).
- `SDT/EIT scrambled flag:` ??? (‘source’, ‘detect’, “scrambled” or ‘not scrambled’).

Finally, click on ‘OK’ to confirm your selection or on ‘Abort’ to discard your selection.

When you save your entries, they will appear in the header of the service redundancy.

Selecting a service source

To configure the service source settings, first click on the cog icon in the ‘Service Source’ section. You will now see the following window::

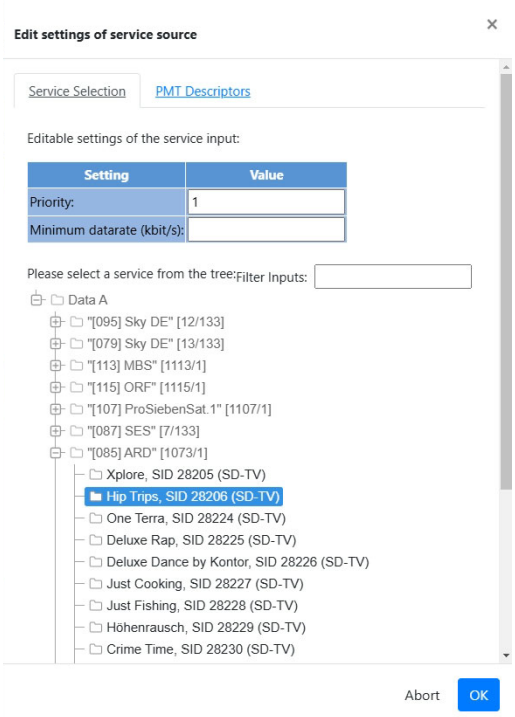


Figure 54: Window „Edit settings of service source - service selection“

First, enter a numerical value for the priority of the source in the input field above (‘1’ for maximum priority, etc.). Then enter the minimum data rate in the input field below.

You can then change the desired service in the list.

Alternatively, you can also manually enter a service in the corresponding input field (‘Filter inputs’).

Select the ‘PMT Descriptors’ tab to configure the relevant settings. You will then see the following overview:

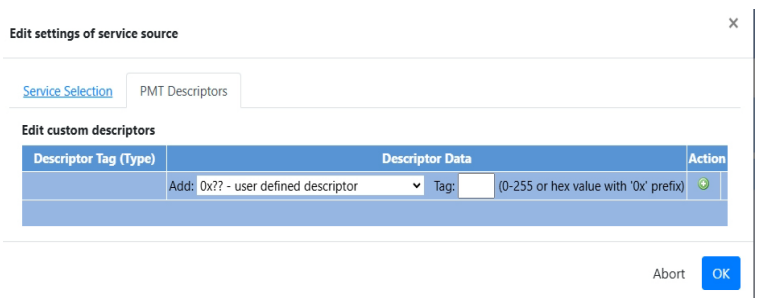
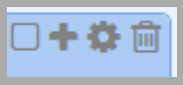


Figure 55: Window „Edit settings of service source - PMT descriptors“

Select the desired descriptor type from the drop-down list and enter the desired tag in the input field. Add the descriptor by clicking on the plus symbol in the ‘Action’ column. Depending on the type selected, you can then make further entries:

- `Country Availability Descriptor:` Enter the country code in the input field.
- `Linkage Descriptor:` Select the service from the drop-down list and enter the linkage type in the input field.
- `Private Data Specifier Descriptor:` Enter a hexadecimal byte sequence in the input field.
- `Data Broadcast ID Descriptor:` Enter the broadcast ID in the input field.

Finally, click on ‘OK’ to confirm your selection or on ‘Abort’ to discard your selection.



Filtering PIDs

To filter individual PIDs from the service, first click on the plus symbol. You will now see the following window:

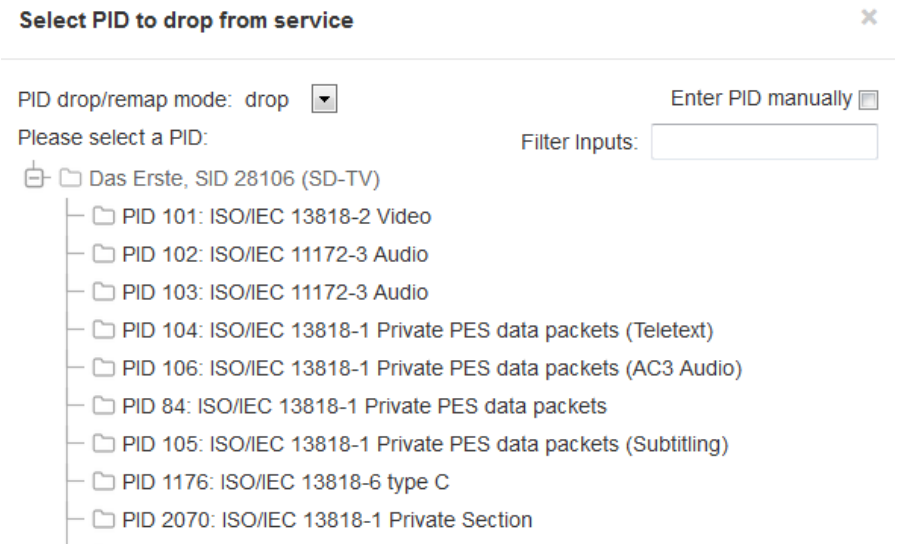


Figure 56: Window „Select PID to drop from service“

Now select either ‘drop’ or ‘remap’ from the drop-down list above. If you select “drop”, the selected PID will be removed from the service. If, on the other hand, ‘remap’ is selected, the PID values will be changed. You can then select the desired PID from the list or specify a PID manually. To do this, activate the ‘Enter PID manually’ checkbox and enter the desired PID in the ‘Filter Inputs’ input field.

Finally, click on ‘OK’ to confirm your selection or on ‘Abort’ to discard your selection.

Click the ‘Apply’ button at the top right of the interface to save changes.

Click ‘Discard’ to restore the original settings.

Menu „Settings“

To configure TS processing settings, first click on the ‘Settings’ entry in the ‘TS Processing’ area on the left-hand side of the main menu. You will now see the following tables in the upper part of the content area:

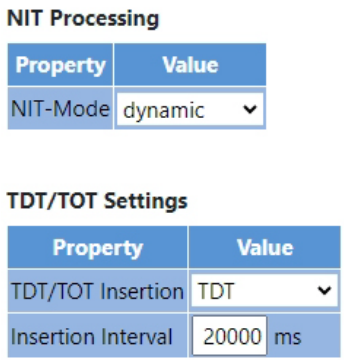


Figure 57: Settings for transport stream processing

Here you can select the desired NIT mode from the drop-down list in the ‘NIT Processing’ table:

- `OFF:` No NIT is generated (transparent from the input).
- `Static NIT:` If you select this mode, a static NIT is generated.
- `Dynamic NIT:` If you select this mode, a dynamic NIT is generated.
- `Remap NIT:` If you select this mode, you can play a NIT from the available PIDs.

In the following table, ‘TDT/TOT Settings’, you can select the following options from the drop-down list:

- `OFF:` transparently from the input
- `TDT:` TDT only
- `TDT/TOT:` TDT + TOT

Click the ‘Apply’ button at the top right of the interface to save changes.
Click ‘Discard’ to restore the original settings.

Menu „NIT“

If you want to adjust the settings for NIT processing, click on the ‘NIT’ entry in the main menu on the left. You will now see the following table in the upper part of the content area:

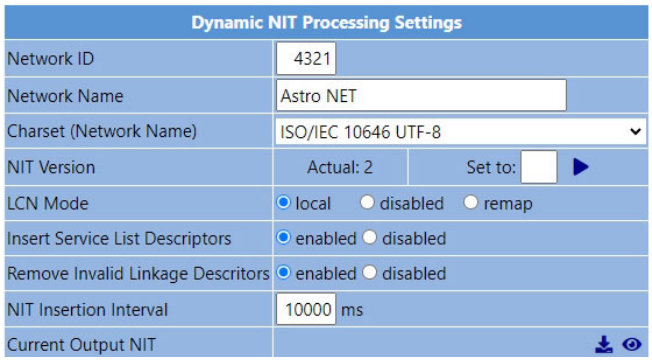


Figure 58: Table „Dynamic NIT Processing Settings“

Here you can adjust the following parameters:

- `Network-ID:` Enter a network ID in the input field here.
- `Network Name:` Enter the network name in the input field.
- `Charset (Network Name):` Select the desired character set from the drop-down list.
- `NIT Version:` The current version is displayed. Enter the desired version in the ‘Set’ input field.
- `LCN Mode:` Select the ‘disabled’ radio button to deactivate the LCN. Select the “local” radio button if you want to use a local LCN. Select the ‘remap’ radio button if you want to remap the LCN.
- `Insert Sevice List Descriptors:` Select the “enabled” radio button to insert service list descriptors. If you do not wish to do this, select the “disabled” radio button.
- `Remove Invalid Linkage Descriptors:` Select the ‘enabled’ radio button to remove invalid linkage descriptors.
- `NIT Insertion Interval:` Enter a time interval in milliseconds for inserting the NIT in the input field.
- `Current Output NIT:` Click on the eye icon to view the XML file of the NIT. Click on the icon to the left of it to download the XML file.

You can define network descriptors in the following table, ‘Network Descriptors’.

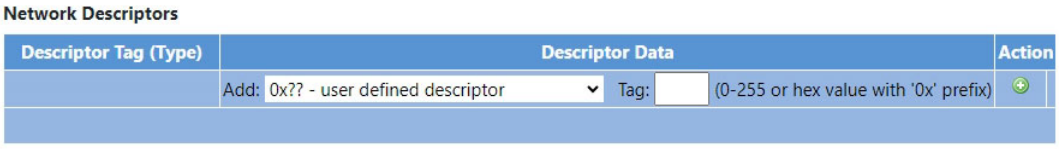


Figure 59: Table „Network Descriptors“

Select the desired descriptor from the drop-down list and enter the desired tag (0-255 or a hexadecimal value with 0x prefix) in the input field to the right. Then click on the plus symbol to add the descriptor.

This is followed by the ‘Add External Transport Streams’ table. Here you can add an external transport stream that is modulated by an external device.

Add External Transport Streams

TS-ID	ON-ID	Frequency	Modulation	Symbol Rate	Action
1	1	306.0 MHz	256 QAM	6.900 MBaud	⊕

Figure 60: Table „Add External Transport Streams“

The following parameters must be configured in detail:

- `TS-ID:` Enter the transport stream ID in the input field.
- `ON-ID:` Enter the ON-ID in the input field.
- `Frequency:` Select the desired output frequency from the drop-down list. If you select the ‘manual’ option, you can enter the frequency manually in MHz in the input field.
- `Modulation:` Select the desired modulation type from the drop-down list.
- `Symbol Rate:` Enter the symbol rate in MS/s in the input field.

nce you have configured all parameters, click on the plus symbol to add the transport stream.

Below is another table listing all added transport flows:

External Transport Streams

No.	TS-ID	ON-ID	Channel - Frequency	Modulation	Symbol Rate	Remove
No external transport streams defined!						

Figure 61: Table „External Transport Streams“

If you wish to remove a transport stream, click on the minus symbol in the corresponding row.

Click the ‘Apply’ button at the top right of the interface to save changes.
Click ‘Discard’ to restore the original settings.

Menu „LCN“

If you want to create an LCN table, first click on the ‘LCN’ menu item in the main menu on the left. You will now see the following table in the upper part of the content area:

Figure 62: Table „Adding services to LCN Table“

eHere you can enter an LCN in the left-hand column and select the desired service (for SD, HD and radio) from the selection list on the right.

Click on the ‘Add selected services to LCN Table’ button to add the selection to the LCN table.

Please note that the added entries will only be saved after you have clicked on the ‘Apply’ button below the ‘LCN Table’ table.

This is followed by the ‘LCN Table’. Here you will see a list of the currently selected services and the parameters ‘Service name’ (programme name), “Type” (SD, HD or Radio), ‘Serv-ID’, ‘TS-ID’ and ‘ON-ID’. To remove an entry from the list, click on the minus sign for the respective service in the ‘Remove’ column. You can move the list entries up or down using the arrow keys in the ‘Action’ column.

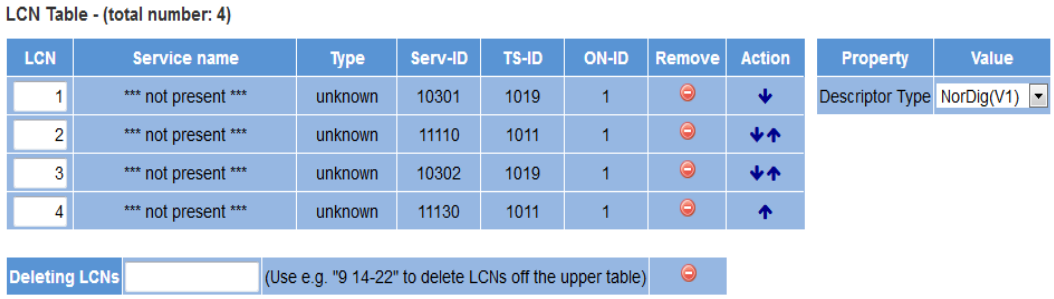


Figure 63: Table „LCN Table“

To the right of the LCN table, you can select the description type for the table from a drop-down list (‘NorDig (V1)’ or ‘IEC 62216’). The descriptor is then generated in the NIT according to this standard.

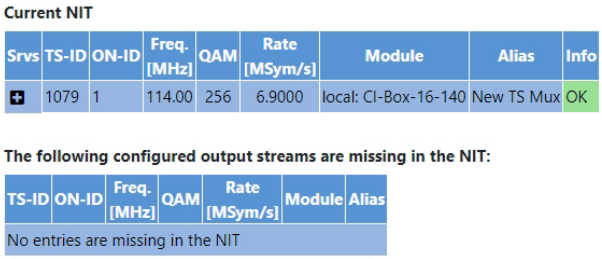
In the last row, you can delete LCNs by entering the corresponding numbers in the input field and then clicking on the minus symbol.

Click the ‘Apply’ button at the top right of the interface to save changes.

Click ‘Discard’ to restore the original settings.

Menu „Current NIT“

To display information about the current NIT, click on the ‘Current NIT’ entry in the main menu on the left. You will now see the following table in the upper part of the content area:



Current NIT

Srvs	TS-ID	ON-ID	Freq. [MHz]	QAM	Rate [MSym/s]	Module	Alias	Info
✚	1079	1	114.00	256	6.9000	local: CI-Box-16-140	New TS Mux	OK

The following configured output streams are missing in the NIT:

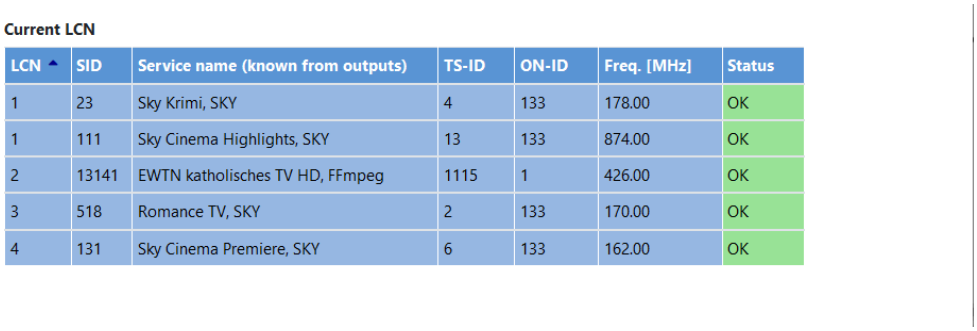
TS-ID	ON-ID	Freq. [MHz]	QAM	Rate [MSym/s]	Module	Alias
No entries are missing in the NIT						

Figure 64: Table „Current NIT“

The ‘Current NIT’ table displays all parameters relating to the NIT. The table below shows any missing output currents.

Menu „Current LCN“

To display the current LCN, click on the ‘Current LCN’ entry in the main menu on the left. You will now see the following table in the upper part of the content area:



Current LCN

LCN ▲	SID	Service name (known from outputs)	TS-ID	ON-ID	Freq. [MHz]	Status
1	23	Sky Krimi, SKY	4	133	178.00	OK
1	111	Sky Cinema Highlights, SKY	13	133	874.00	OK
2	13141	EWTN katholisches TV HD, FFmpeg	1115	1	426.00	OK
3	518	Romance TV, SKY	2	133	170.00	OK
4	131	Sky Cinema Premiere, SKY	6	133	162.00	OK

Figure 65: Table „Current LCN“

The ‘Current LCN’ table displays the SID, service name, TS ID, ON ID, frequency and status associated with each LCN.

Menu „QAM Output“

To configure general settings for the QAM outputs, first click on the ‘QAM Output’ entry in the ‘TS Output’ area on the left-hand side of the main menu and then on the ‘RF Settings’ entry at the top of the submenu. You will then see the following table in the content area, where you can configure the most important settings for all output channels.

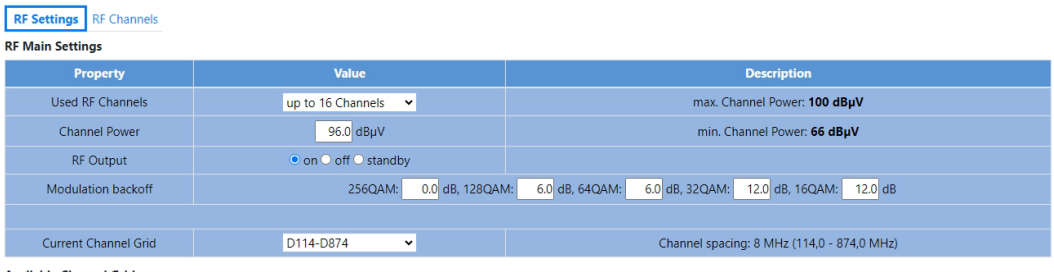


Figure 66: Table 1 „RF Main Settings“

- `Used RF Channels:` Select the number of RF channels used (either 16, 32 or 64) from the drop-down list.
- `Channel Power:` Enter the desired overall level in dBµV in the input field to attenuate an excessively high overall level.
  Important: First adjust the desired overall level here. Do not use the individual levels at the outputs to set the overall level!
- `RF Output:` Here you can switch the HF output on or off or set it to standby by clicking on the corresponding radio button. If you select the ‘Standby’ option here, this means that the signal is activated but is not forwarded to the output.
- `Modulation backoff:` Here you can enter the maximum level in dB for each individual modulation.
- `Current Channel Grid:` Select the desired channel grid from the drop-down list (e.g. D114-D874, D73-D834 or D242-D1002).

Click the ‘Apply’ button at the top right of the interface to save changes.
Click ‘Discard’ to restore the original settings.
Below you will find the table ‘Available Channel Grids’.

Figure 67: Table 2 „Available Channel Grids“

Here you can add additional channel grids by clicking on the ‘Select File’ button in the ‘Add Grid’ line and then selecting the appropriate file. Contact ASTRO Customer Service to obtain the desired channel grids.
Once you have selected a file, click ‘Upload’ to add the selected grid.

To add and configure individual output channels, click on the ‘RF Channels’ entry in the submenu at the top. You will now see the ‘Adding / Deleting of RF Channels’ table in the upper section:

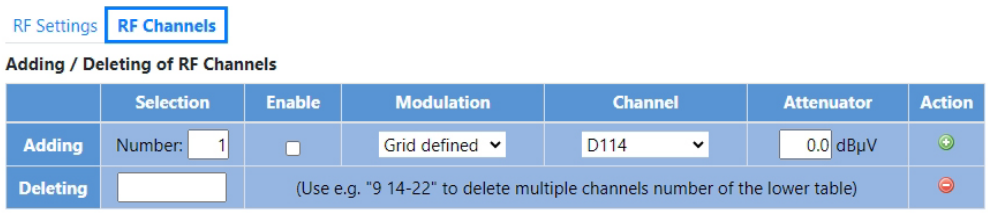


Figure 68: Table 1 „Adding / Deleting of RF Channels“

Here you can add or remove QAM channels by clicking on the plus or minus sign. You can also enter a range ‘from - to’ in the input field to delete several channels at once (e.g. 3-7 or similar).

In the ‘Selection’ column, you can enter a number in the input field for a new channel to be added. Activate or deactivate the channel by activating or deactivating the corresponding checkbox in the ‘Enable’ column.

Select the desired modulation from the ‘Modulation’ drop-down list (16 QAM, 32 QAM, 64 QAM, 128 QAM, 264 QAM or a custom setting). Now select the channel frequency from the ‘Channel’ drop-down list. If desired, you can enter an attenuation value in dBµV in the ‘Attenuator’ input field.

Add the channel by clicking on the + sign.

This is followed by another table, ‘RF Channel Settings’, which provides an overview of the currently available RF channels.

Here, too, you can activate/deactivate the respective channel, select the modulation, adjust the channel frequency and, if necessary, enter an attenuation value, as described above. In addition, you can select the desired transport stream with which the output channel is to be modulated in the ‘Transport Stream’ column. Using the arrow keys, you can sort the channel list according to one of the parameters (e.g. display activated channels or those with a specific modulation first). Click on the symbol next to the arrow keys in the ‘Transport Stream’ column to open an input field. Here you can enter a transport stream address to filter by.

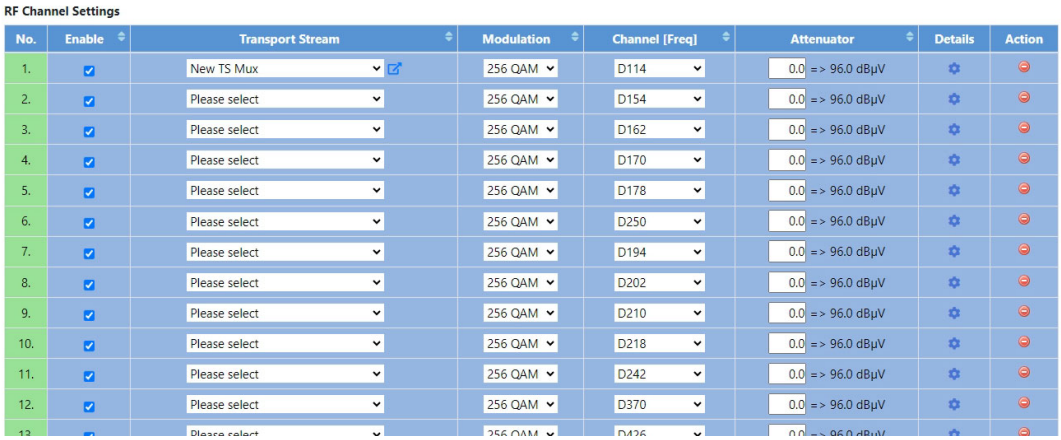


Figure 69: Table 2 „RF Channel Settings“

NOTE: Channels that are not active are marked in grey in the left-hand column. Chan-nels marked in red indicate errors! If you move the mouse over the respective channel number in the ‘No.’ column, the parameters ‘Max. data rate’, ‘Used data rate’, ‘Null data rate’ and ‘Utilisation’ are displayed in a pop-up window.

Click the "Apply" button in the upper right corner of the interface to save changes.

Click "Discard" to restore the original settings.

In the "Details" column, click the gear icon to access the detailed settings of an output channel. You will then see the "Detailed RF Channel Settings" table.

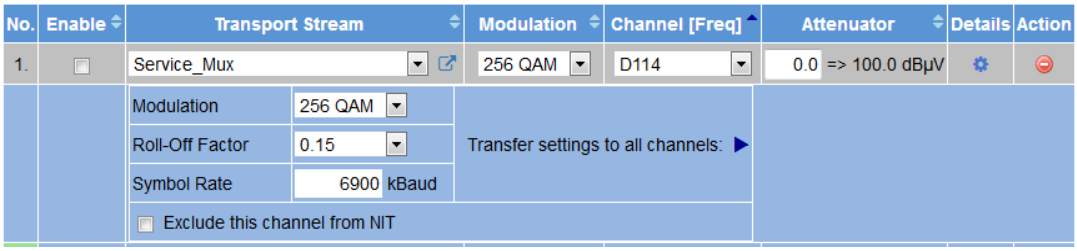


Figure 70: RF Channel Settings - Details“

In addition to the modulation, you can also enter the symbol rate in MBaud and the roll-off factor in the "Symbol Rate" input field.
Activate the checkbox in the last line to remove the channel from the NIT.

Click the "Apply" button in the upper right corner of the interface to save changes.
Click "Discard" to restore the original settings.

Menu „User Settings“

Click on the "User Settings" menu item in the left-hand menu to display the corresponding input form. You will now see the input form shown in Figure 71.

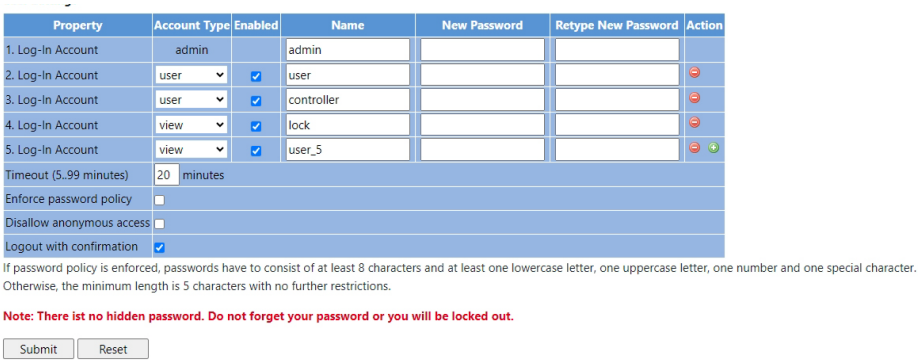


Figure 71: User management

You can create up to four users for the device's user interface. The following three users are created by default:

- user
- admin
- controller

The password for all three users is "astro"
To change or create new login details for a user account, enter the desired username in the `Name` input field. Type in the desired password into the `New Password` field and for confirmation additionally into the `Retype New Password` field.

NOTE: A password must have a minimum length of 5 characters!

To delete user account, click on the `Minus` symboln in the right column of the table.
You can also adjust the following settings:

- `Timeout:` In this input field, you can enter a time period in minutes for automatic logout. If no further input is received in the user interface, automatic logout will occur after the specified time has elapsed. The time remaining until automatic logout is displayed below the menu in the left column.
- `Expertenmodus:` Enable this option to access additional settings.
- `Enforce password policy:` Select this checkbox if additional rules should apply to password selection (at least 8 characters long, must contain both uppercase and lowercase letters, at least one number and at least one special character). If this option is not selected, a password only needs to be 5 characters long.
- `Disallow anonymous access:` Check this box if you want to prevent unauthorized access.
- `Logout with confirmation:` If you activate this checkbox, you will be asked to confirm the logout again after clicking the logout button in the top right corner of the screen.

IMPORTANT: All changes will only take effect after you click the "Apply" button below the input form! Click the "Reset entries" button to delete entered values.

Menu „IP Interfaces“

This section explains how to configure general settings for the IPQ BOX interfaces. Click on "IP Interfaces" in the left-hand menu.

Configuring IP interfaces (can only be done by administrators)

In the table above (“Data Interfaces”), you can configure and activate or deactivate the four IP interfaces (Data A, B, C, D). The connection type is automatically detected and displayed by the IPQ BOX (here: 1 Gbit/s, full duplex).

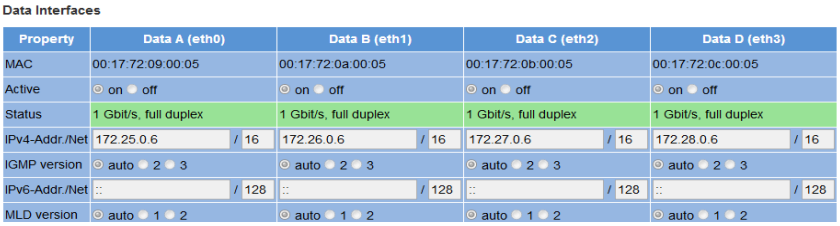


Figure 72: Configuring IP intefaces

NOTE: *An additional license is required for the use of IP interfaces B, C and D (see section “Licensing”).*

The following parameters are displayed or can be configured:

- `MAC:` MAC address of the respective interface
- `Active:` Select the "On" radio button to activate the interface. Select the "Off" radio button to deactivate it.
- `Status:` switched off or active (transfer rate is displayed)
- `IPv4-Addr./Net:` IPv4 address (left field) / Net (right field)
- `IPv6-Addr./Net:` also supported: IPv6 address (left field) / Net (right field)
- `MLD versions:` MLO + IGMP Protocol versions

NOTE: *When programming IP addresses, ensure that the addresses are not already assigned on your network. Address conflicts will lead to network malfunctions! (Please set unused parameters to 0.0.0.0.).*

Click the "Apply" button in the upper right corner of the interface to save changes.
Click "Discard" to restore the original settings.

Making management settings

In the second table (“IP Management Interfaces”), you can configure the following management settings for the two management interfaces (A, B):

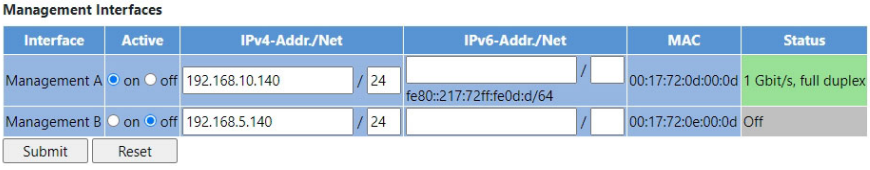


Figure 73: Making management settings

The adjustable parameters correspond to those in the table “IP Interfaces”.

Click the "Apply" button in the upper right corner of the interface to save changes.
Click "Discard" to restore the original settings.

Menu „Networking“

This section explains how to configure the network settings for your device. In the menu on the left, click on "Networking"

Making network settings

You will now see the following tables in the content area on the left:

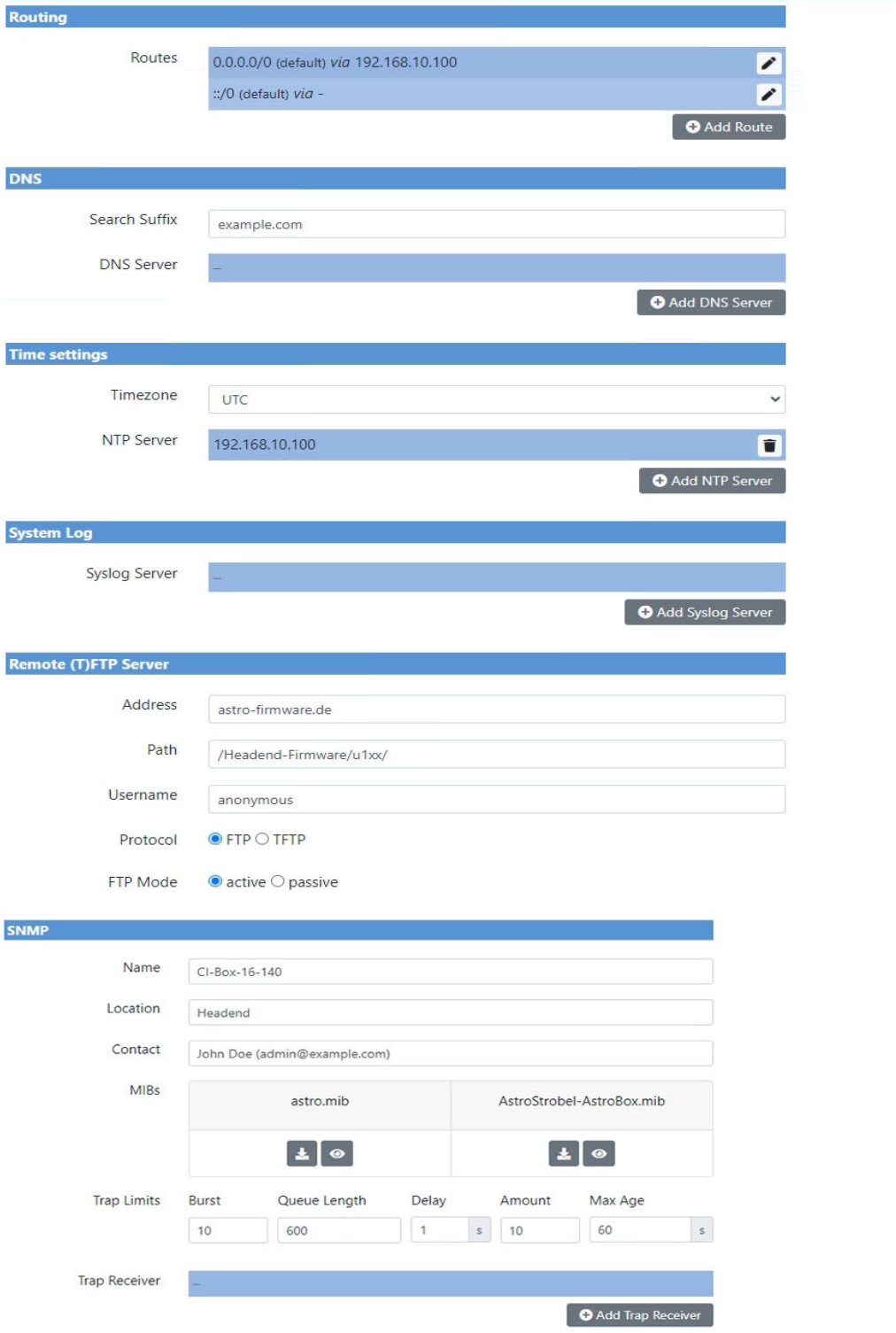


Figure 74: Configuring network settings

- `Routing:` Enter the gateway for IPv4 and IPv6 for the default routing here. To add a specific route, first click the "Add Route" button and then enter the desired values in the input fields. To edit a route, click the pencil icon next to the respective routing entry.
- `DNS:` Click the "Add DNS Server" button to add one (or more) DNS servers. Enter the IP address of the DNS server in the "DNS Server" field.
- `Time Settings:` Wählen Sie aus der Auswahlliste „Timezone“ die gewünschte ZEitzone aus. Anschließend klicken Sie auf die Taste „Add NTP Server“, um einen (oder mehrere) NTP Server hinzuzufügen. Geben Sie die Adresse eines NTP-Servers in das Eingabefeld ein. Um einen Server zu entfernen, klicken Sie auf das Symbol mit der Mülltonne.
- `System Log:` Select the desired time zone from the "Timezone" drop-down list. Then click the "Add NTP Server" button to add one (or more) NTP servers. Enter the address of an NTP server in the input field. To remove a server, click the trash can icon.
- `Remote (T)FTP Server:` Enter the address, path, and username of the FTP server in the respective input fields. Select FTP or TFTP as the protocol by activating the corresponding checkbox. Select "active" or "passive" as the FTP mode by activating the corresponding checkbox.
- `SNMP:` Enter the device information here (name, location, contact person). Click the eye icon to view the MIB file or the arrow icon to download it. Click the "Add Trap Receiver" button to add one (or more) SNMP trap receivers. Enter the address of the SNMP trap receiver in the "Host Name" field and the port in the "Port" field. You can enter a password-like string in the "Community" field. Select the desired version ("V2c" or "V3c") from the drop-down menu. Check the "Inform Msg." box if you want to enable Inform for SNMP version 3. To remove a trap receiver, click the trash can icon. Click the "Add SNMP User" button to add one (or more) SNMP users. Enter the username in the corresponding field. Select the desired version ("V2c" or V3c") from the "Version" drop-down menu. Select the access permission ("read" or "read/write") from the "Access" drop-down menu. To remove a user, click the trash can icon.

Click the "Apply" button in the upper right corner of the interface to save changes.
Click "Discard" to restore the original settings.llen.

Menu „TLS Settings“

NOTE: A license is required to use the TLS functions! It is recommended that TLS settings only be configured by appropriately qualified personnel.
If you have any questions, please contact ASTRO Customer Support.ienst.

Menu „Licensing“

Some device functions can only be used after you have unlocked them with a license key.
You can purchase the license key for each function from ASTRO. You will then receive a license key that allows you to activate the functions via the web browser interface.
The license keys are in the format of a text document (e.g., 001772000222.lic).
To activate the functions, first click on "Licensing" in the main menu on the left. You will then see an overview of the licensed functions and their status at the top.

Active licenses for 0017720d000d

License	Value
Enabled data ports	A, **A B**, A B C, A B C D
FEC	**Disabled**, Enabled
Redundancy	**Disabled**, Enabled
TS processing	None, Pass/Drop, Simple, **Full**
Max. RF channels	1, 8, **16**, 24, 32, 40, 48, 56, 64
Max. RF channels (old)	**0**, 16, 24, 32, 40, 48, 56, 64
TS analyzer	Disabled, **Enabled**
QAM monitoring	**Disabled**, Enabled
TLS (SSL)	Disabled, **Enabled**
CA systems	0, **1**, 2, 3, 4, 5, 6
LCN remap	Disabled, **Enabled**
SRT Receivers	**Disabled**, Enabled
Enable grace period	10 periods left

Figure 75: Table „Licensing“

To order additional licenses, you must provide the MAC address of the device's Management A module. After receiving the MAC address, ASTRO will generate the license keys and send them via email or on CD.
Below the "Licensing" table, you will find another table, "Upload license file."

Upload license file

Filename	Action
Durchsuchen... Keine Datei ausgewählt.	

Figure 76: Tabee „Upload license file“

Here you can upload license files. To do this, click on "Browse" and select the desired file. Then click on the icon in the "Action" column to upload the file.

Menu „Configuration“

Under the menu item "Configuration" you can upload, download or view various configuration data files.

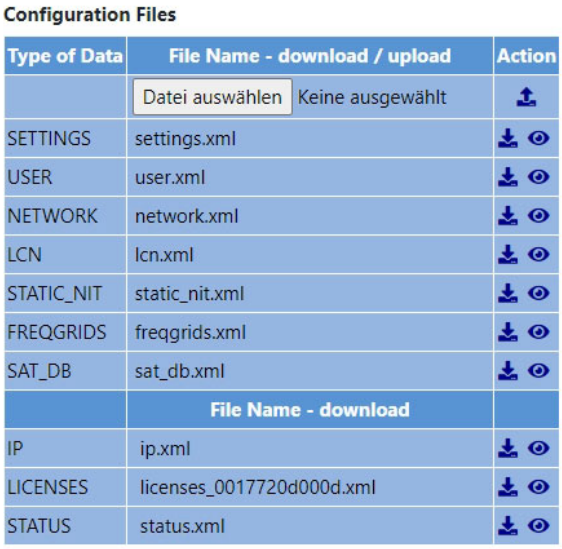


Figure 77: Upload, download, or view configuration files

To upload a file, use the "Browse" button to select the desired file.

Then click the "Upload" button to start the upload process.Various files are available for download (see screenshot above). In the "Action" column, click the eye icon to open a file. Click the icon to its left to download the file.

You can also upload or download various configuration backups.

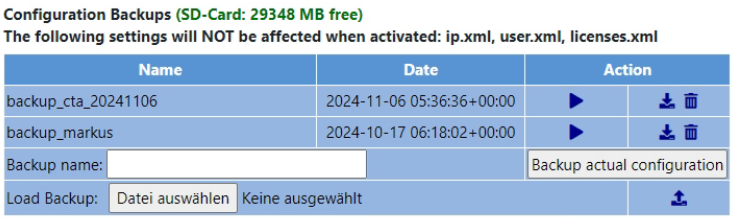


Figure 78: Upload, download, or view configuration files

Click the trash can icon to remove a backup.

Activate the checkbox “Reset device to default settings” to restore the default settings.

Click the "Apply" button in the upper right corner of the interface to save changes.

Click "Discard" to restore the original settings.

Menu „Update“

Under the menu item "Update," you can update the firmware version of your device.

The "Last log" listing at the top shows an overview of the most recently performed update:

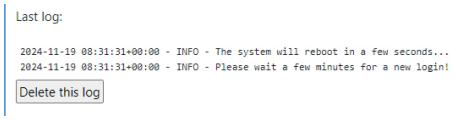


Figure 79: Overview„Last log“

Firmware update from local storage

To update the device's firmware, you need an update archive. You can download this from the ASTRO Firmware Server (address: "http://astro-firmware.de/Headend-Firmware/u1xx"). The required archive filename has the extension ".up". The name consists of the device's model number and a four-digit version number. After downloading the update archive, select "Update" from the user interface menu. In the content area, you will now see the table "Software Update / Reboot" at the top.

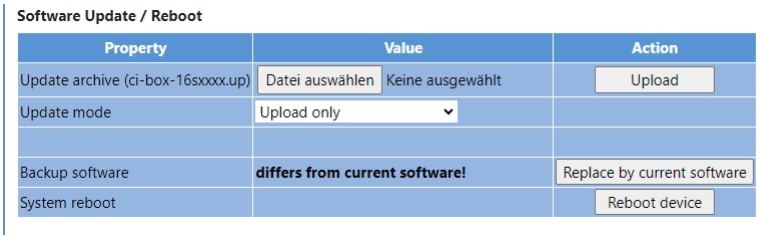


Figure 80: Firmware update

Now click the "Select File" button and choose the path to the location of the previously downloaded update archive.

If you only want to upload the update archive to the device, select "Upload only" in the "Update Mode" row. Then click the "Upload" button to start the update process. If you want to both upload and install the update, select "Upload, update and reboot" in the "Update Mode" row. Then click the "Upload, update and reboot" button. If you want to replace the current software with a backup version, click the "Replace by current software" button. If you only want to restart the device, click the "Reboot device" button.

Available update archives

The "Available Update Archives" table provides an overview of the update archives already stored on the module (up to ten). As an administrator, you have the option to access (install or delete) other software versions.

Figure 81: Firmware update

Download/save firmware and configuration via T(FTP)

The "Remote (T)FTP functions" table allows you to perform a firmware update via (T)FTP server and to load or save configuration files.

Remote (T)FTP functions

Property	Value	Action
(T)FTP Server address	astro-firmware.de	
Path	/Headend-Firmware/u1xx/	
Protocol / Mode	FTP / active	
FTP Username	anonymous	
FTP Password	•••••••	
Version		
(T)FTP Action	Please Select	⇄

Figure 82: Load/save firmware update and configuration files via(T)FTP

After selecting an action, you can add the missing information in the remaining rows of the table:

- `(T)FTP Server address:` Address of server
- `Path:` Path to server
- `Protocol / Mode:` Select the "FTP" radio button if you want to use the more comprehensive FTP protocol. Select the "TFTP" radio button if you want to use the simpler TFTP protocol.
- `FTP Username:` Depends on the settings of the FTP server used (e.g., “anonymous” for astro-firmware.de)..
- `FTP Password:` Depends on the settings of the FTP server used (e.g., "guest" for astro-firmware.de).
- `Path:` Path to the location where data is stored or from which data can be downloaded. The path must be relative to the root directory of the FTP server and must always begin and end with "/" (without quotation marks).
- `Version:` Enter the software version number you wish to download or save here.

To perform a desired action, first select an action from the drop-down list in the "(T)FTP Action" row. The action can only be executed if the specified server path actually exists. Additionally, any firewall that may be configured must be set up to allow (T)FTP communication.

The following actions are available for selection::

- Action “**Load config from server**”: A configuration stored on the (T)FTP server is transferred to the U 168 and activated immediately. The IP settings of the data and management interfaces on the device are not changed. The file “settings.xml” is written to the device.
- Action "**Save config to server**": The current device configuration is written to the (T)FTP server. The configuration includes the following files:
  - "ip.xml" (IP settings of the data and management interfaces)
  - "settings.xml" (All other settings, e.g., IP receiver and modulator settings)
  - "user.xml" (User data)
- Action "**Update firmware from server**": If you select this action, you must specify the desired software version under `Version` (maximum 4 characters). After a successful update, the message "Firmware Update OK. Please reboot to use the new firmware version." will appear.

NOTE: If the update is performed via the TFTP protocol, it is not necessary to fill in the input fields "FTP Username" and "FTP Password".

Menu „Logging“

To configure logging settings or view a log file, click on "Logging" in the main menu on the left. You will then see the following overview:

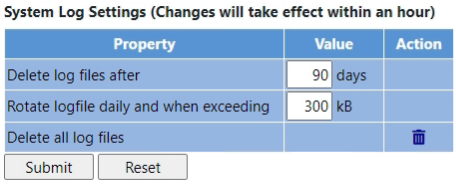
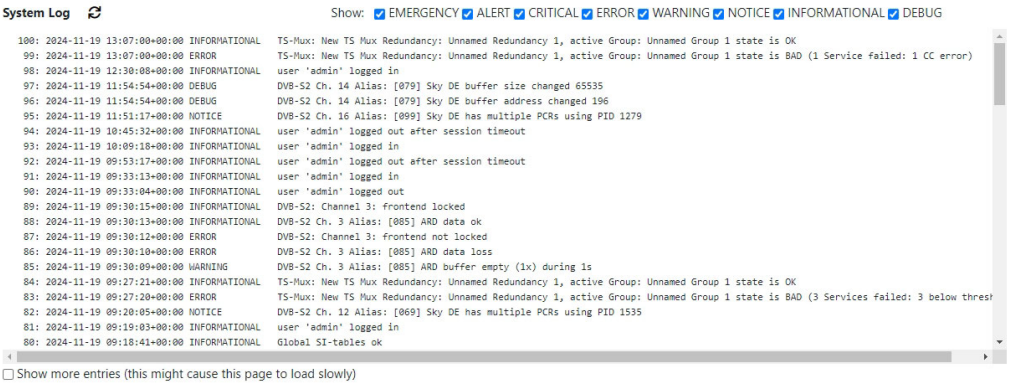


Figure 83: Menu „Logging“

n the "System Log Settings" table, you can specify after how many days the log files should be deleted, as well as a limit for the file size of the log file. If this limit is exceeded, a new file will be created.

To view a log file, click on the desired entry in the "Download Log Files" table.



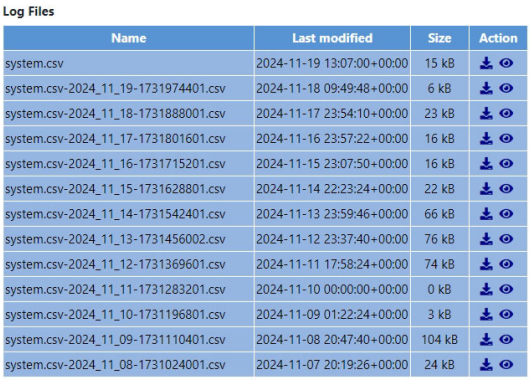


Figure 84: Logfiles

Troubleshooting

If the device is not functioning correctly, please perform the following checks:

- ☐ Check whether the device has been connected to the required mains voltage (230 V~, 50 Hz).
- ☐ Check whether the signal cable is connected correctly, and that there are no breaks or short circuits in the connectors.

If the problem cannot be resolved, please contact the ASTRO customer service.

Maintenance and repair

ATTENTION: ***The following safety information must be observed when performing main-tenance and repair work. Failure to observe this safety information may result in personal injury due to electrical and thermal dangers!***

- ☐ The operating display only shows whether the DC current, which supplies the device components, has been disconnected from the mains voltage. If the operating display (for the power supply unit or the device) does not light up, this does not mean that the device has been fully disconnected from the mains voltage. There may still be voltages in the device that are dangerous to touch. You may therefore not open the device.
- ☐ The cover for the power supply unit is designed to prevent accidental contact with voltages that are dangerous to touch, and must not be removed.
- ☐ Housing components near the cooling fins at the rear, or actual the cooling fins, may become very hot.
- ☐ Read carefully: EN 60728-11 Safety requirements: No service work during thunderstorms.
- ☐ A defective device may only be repaired by the manufacturer to ensure that components with the original specification are used (e.g. power cable, fuse). Improperly performed repairs may result in considerable dangers for the user or installer. If malfunctions occur, the device must therefore be disconnected from the mains and authorised experts must be consulted. The device may need to be sent to the manufacturer.

Technical data

Type		IPQ BOX 16
Order number		380 063
EAN-Code		4026187280635
IP interfaces		2 with overall 256 SPTS
Network Interfaces		
Management		2x 1000 Base-T Ethernet (RJ 45) (10, 100, 1000)
Data		2x SFP (1000 Base-X or SGMII) (optional)
Bitrate per data port		1000/1000/1000/750 @ 1/2 Ports
Protocols		Ethernet, ARP, IPv4, IPv6, VLAN, UDP, RTP, TCP, HTTP(S), SNTP, SNMP v2c/v3, Syslog, IGMP v2/v3, MLD v1/v2
SAT-IF Interface		
Type of Interface	Ω	4 x Coaxial, 75
Reflection loss	dB	10, typical
Remote supply voltage	V	13,0 - 20,3
Remote supply current	mA	max. 400 (per input)
Demodulator		
Frequency range	MHz	950 – 2150
Standards		DVB-S, DVB-S2(X)
Input symbol rate DVB-S	MS/s	1,0 - 54
Input symbol rate DVB-S2(X)	MS/s	min: 2,0 **Actice RX: 1-16 / 1-4, 9-12 / 1-4*** QPSK 45 / 64 / 70 8PSK 29 / 46 / 70 16APSK 22 / 35 / 70 32APSK 17,5 / 28 / 56 64APSK 14,5 / 25 / 46 128APSK 12,5 / 23 / 40 256APSK 11,0 / 21 / 35
Input level	dBµV	60 – 90 (32 channels)
CI Interfaces		
CI Slots		6x (front access)
CI data rate	MBit/s	70
Supported modules		Al Jazeera Sports, Alphacrypt, Aston, Conax, Cryptoworks, Diablo, Dragon, Dreamcrypt, Entavio CAM, Free-X TV, Giga, GkWare BISS CAM, Homecast CAM, ICECrypt, Irdeto Access, Joker, Kid CAM, Magic Module, Mascom Cryptoworks, Matrix CAM, Mediaguard Canal Digitaal, Nagravision, Oasis CAM, PCMCIA Cam, PowerCam Pro, Premiere Worldcam, T-Rex Twin Module, TechniCAM Beta2, Technicrypt, TPS, Reality CAM, SMiT, Ultimate CAM, Universal CAM, Viaccess, Videoguard CAM, X-Cam, Zetacam Blue
Connections		6x PCMCIA
Transportstream processing		
TS Decapsulation		UDP, UDP/RTP, 1 - 7 packets, FEC (SMPTE 2022-1, -2)
Packet length		188 Bytes
Data rate adjustment		☑
PCR correction		☑ (< 500 ns accord. DVB)
NIT handling		static, NIT out of PID, dynamic
QAM Modulator		
Modulation		16-, 32-, 64-, 128-, 256-QAM
Signal processing		DVB EN 300 429, ITU J.83 A/C
Spectrum shaping		cos-roll-off (12%, 13%, 15%, 18%)
FEC		Reed-Solomon (204,188)-Code

Symbol rate	Msym/s	1 -7,14
Bandwidth	MHz	1,12 - 8 (depends on symbol rate)
Max. number of output channels		16
Max. bit rate per output channel	Mbit/s	52,64
Phase error dynamic		< 0,3°
MER (EQ)	dB	≥ 44
Shoulder attenuation	dB	> 56
RF Modulator		
Connectors		2x F-jack 75 Ω (1x RF, 1x Testpoint -20 dB)
Frequency range	MHz	47 - 1006, digitally modulated
Frequency deviation	kHz	< 10
Output level	dBµV	96 @ 16 channels
Common data		
Power consumption	W	typical 50, max. < 75
Input voltage	V	230
Dimensions (W x H x D)	mm	wirhout mounting brackets: 19 Zoll, 2HU; 422 x 86,5 x 220 with mounting brackets: 480,6 x 87 x 220
Installation height / Operating height	m	≤ 2000 N.N.
Ambient temperature	°C	0 ... +45

ASTRO Bit GmbH

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