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# U 168 U 168-X

## DVB-C/T/T2 to IP Streamer



## Operating Manual

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## Before starting operation of the device

**HINWEIS:** 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. A PDF version of this manual is available to download on the ASTRO website (there may be a more recent version).

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

## Symbols and conventions used

### Symbols used in these instructions

Pictograms are visual symbols with specific meanings. You will encounter the following pictograms in this installation and operating manual:

Warning about situations in which electrical voltage and non-observance of the instructions in this manual pose a risk of fatal injuries.



Warning about various dangers to health, the environment and material.



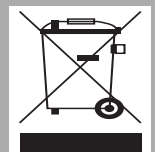
Warning about thermal dangers (risk of burns).



Recycling symbol: indicates components or packaging materials which can be recycled (cardboard, inserts, plastic film and bags). Used batteries must be disposed of at approved recycling points. Batteries must be completely discharged before being disposed of.



This symbol indicates components which must not be disposed of with household rubbish.



### Copyright information

Parts of the software used with this product originate from third-party vendors and were developed under a variety of licensing conditions. Detailed information on the licences can be found on the device's web user interface. If you select the menu item "Licensing" on the web browser interface of the device, you will find a link to a page with detailed information.

You can obtain the source code for licence-free parts of the software upon request and against payment of a processing fee.

Please contact us at:

kontakt@astro-strobel.de  
 ASTRO Strobel Kommunikationssysteme  
 Olefant 1-3  
 D-51427 Bergisch Gladbach (Germany)  
 Tel.: (+49) 2204 405-0

All other parts of the software used with this product are subject to the copyright owned by ASTRO Strobel GmbH.

## Proper use

The devices of the U 1xx- and U 2xx series are only used for converting signals of different modulation to / from IP data streams in multimedia cable networks. The power supply unit U 100 SNT eco / U 100 SNT eco+ may only be used for the power supply of the U 1xx- and U 2xx units within the base unit U 100-230. Modification of the devices or use for any other purpose is not permitted, and will immediately void any guarantee provided by the manufacturer.

## Target group of this manual

### Installation and starting operation

The target group for installation and starting operation of the ASTRO headend technology are qualified experts who have training enabling them to perform the work required in accordance with EN 60728-11 and EN 60065. Unqualified person are not allowed to install and start operation of the device.

### Device configuration

Target group for the configuration of the ASTRO headend are persons who have received instructions and have training enabling them to perform a configuration. Knowledge of EN 60728-11 and EN 60065 is not necessary for configuration.

## Device description

The delivery is comprised of the following parts:

- ☐ U 168 or U 168-X DVB-C/DVB-T/DVB-T2 in IP streamer, including a display module and back-plane
- ☐ Operating manual

The U 168 resp. U 168-X plug-in module and the U 100 base unit feature a CE marking. This confirms that the products conform to the relevant EC directives and adhere to the requirements specified therein.



Figure 1, top:  
U 168, installed in the U 100 base unit  
(fitted with three plug-in modules)

Figure 1, middle:  
U 168, front panel  
[1] Screw for the front panel  
[2] Display for management IP addresses,  
data IP addresses, status messages, etc.  
[3] Status display  
[4] Control and data knob, menu switch

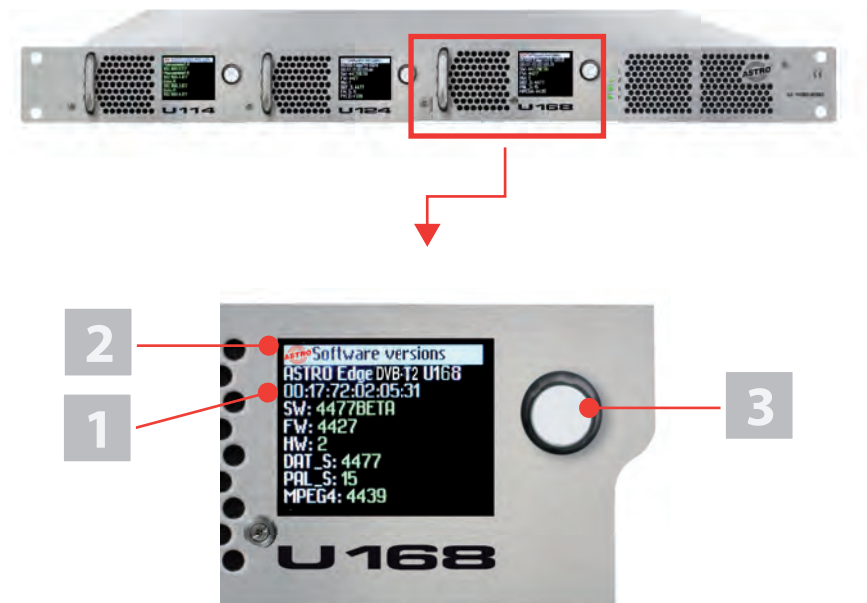
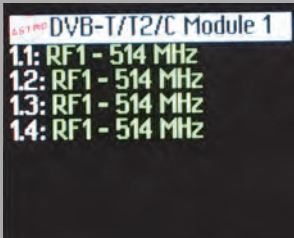
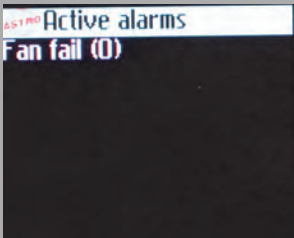
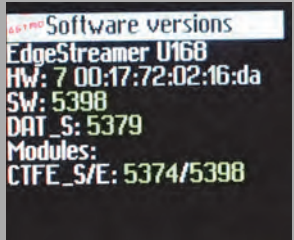
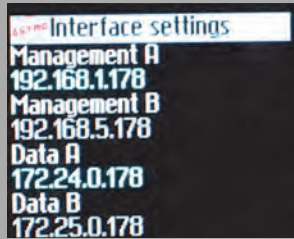
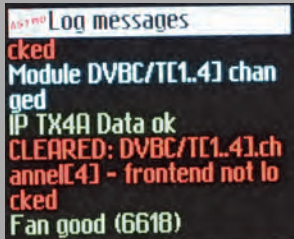


Figure 1: U 168



*HINWEIS:* Turning the data knob [4] (fig. 2, above) allows you to navigate through the individual menu items in the device display. Press the data knob to switch on the display.

The ASTRO logo will be the first display to appear following activation.

Turning the data knob clockwise allows you access the individual displays:

- ☐ Log messages: The last messages entered in the log book are displayed.
- ☐ Interface settings: IP addresses of the network interface.
- ☐ Software versions: The version of the plug-in module software currently installed is displayed.
- ☐ Active alarms: The current error messages are displayed.
- ☐ DVB-T/T2/C module 1: The status of the four channels set is displayed. The display for module 2 follows on the next screen.

The different text colours refer to:

- ☐ Red: Error (the corresponding display in the web interface log book is: "error")
- ☐ Yellow: Warning (the corresponding display in the web interface log book is: "warning")
- ☐ Purple: Critical error (the corresponding display in the web interface log book is: "critical / alert / emergency")
- ☐ Light blue: Info (the corresponding display in the web interface log book is: "info")
- ☐ Light green: Notice (the corresponding display in the web interface log book is: "notice")



## Important safety information

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

**ACHTUNG:** *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

**HINWEIS:** *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.

To avoid any hazardous situations to the extent possible, you must adhere to the safety instructions in the operating manual of the U 100-230 / U 100-48 base units.

### Installation, operation, maintenance

**WICHTIG:** *The outputs of the signal converter must not be operated without connecting a combining network or terminating impedance!*

- ☐ The device may only be installed and operated by qualified persons (in accordance with EN 60065) 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.
- ☐ 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.
- ☐ No objects may be placed on the device.
- ☐ 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.
- ☐ 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 60950-1.
- ☐ 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.





- ☐ 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.
- ☐ 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.

The module may only be operated in the base units U 100-230 and U 100-48 made by ASTRO. Observe the assembly instructions in the operating manual for the U 100-230 / U 100-48 base unit.

- ☐ **ACHTUNG:** *Disconnect both power plugs before opening 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 - Part 1 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.

## 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 our packaging materials (cardboard boxes, insert sheets, plastic films and bags) are fully recyclable. After use, this device must be disposed of as electronic waste in an orderly manner according to the current disposal regulations of your district / country / state.

ASTRO Strobel is a member of the Elektro system solution for the disposal of packaging materials. Our contract number is 80395.

## Performance description

The U 168 resp. U 168-X uses two input sockets for reception of up to eight DVB-C, DVB-T or DVB-T2 streams. The two Ethernet data ports in the U 168 resp. U 168-X can then be used to output up to 8 IP video data streams.

To use the devices properly, read the following safety and operating instructions attentively.

The U 168 resp. U 168-X plug-in module features the following performance characteristics:

- ☐ Conversion of up to 8 DVB-C, DVB-T or DVB-T2 input signals into 8 IP gigabit multicast groups
- ☐ 24 streams per height unit possible
- ☐ Easy configuration using web browser interface

The U 168-X module additionally features scrambling of L1 post signalling for DVB-T2.



## Connecting and installing the module

**HINWEIS:** The instructions for the base unit U 100 include a description of how to prepare the base unit for installation.

Observe that you need to insert an SD memory card into the module prior to installation in the base unit (see figure at left).



### Coding and installing the backplane

A backplane is included with every U 1xx signal converter. This is used to establish a mechanical connection between the signal converter and the base unit. Both the mains HF connections and the network connections are connected to this backplane. There is usually a temperature-controlled fan for cooling the signal converter on the backplane. This can be replaced while the device is operating.

To ensure the position of the backplane, and therefore the position of the respective signal converter in the U 100 base unit, is correct, you must plug a corresponding jumper into the circuit board on the backplane. Proceed as described in the following.

- [1] Left slot
- [2] Middle slot
- [3] Right slot

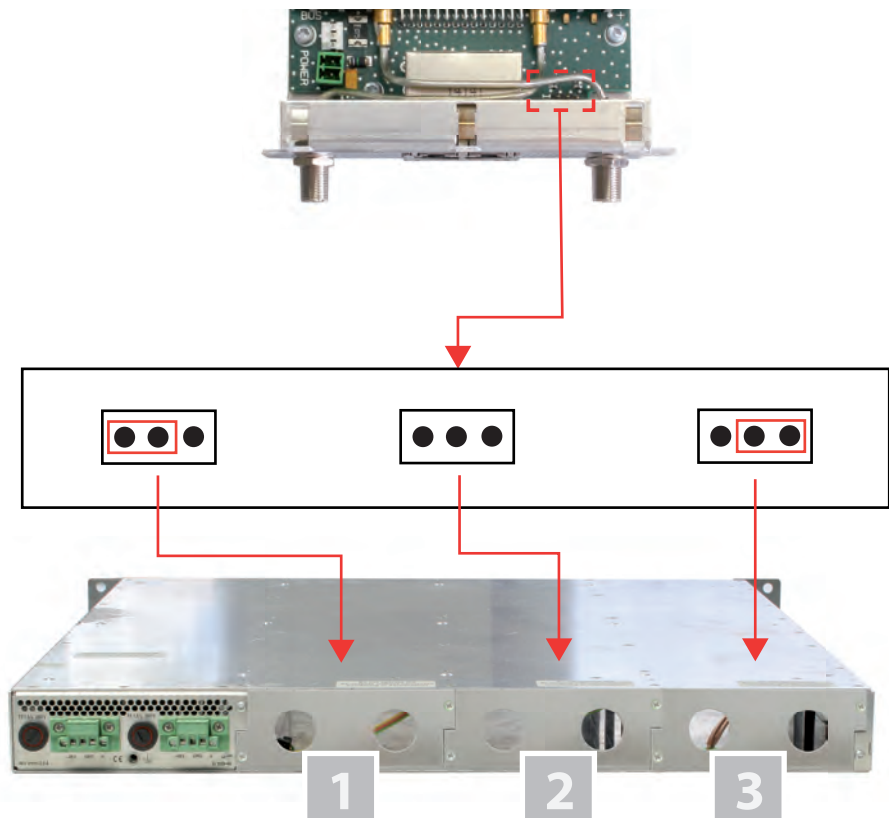


Figure 2: Coding the backplane by plugging in the jumper



To prepare the backplane for installation, proceed as follows:

Plug the jumper into the installation position provided in accordance with figure 3.

**HINWEIS:** A jumper which has not been correctly plugged into the corresponding installation position will result in incorrect LED displays on the front of the U 100 base unit (see section "Device description"). Furthermore, the correct position cannot be displayed on the web browser user interface.

You can now install the backplane in the base unit. To do so, proceed as follows:

- [1, 2] Phillips-head screws
- [3] Cable for signal supply
- [4] Cable for power supply

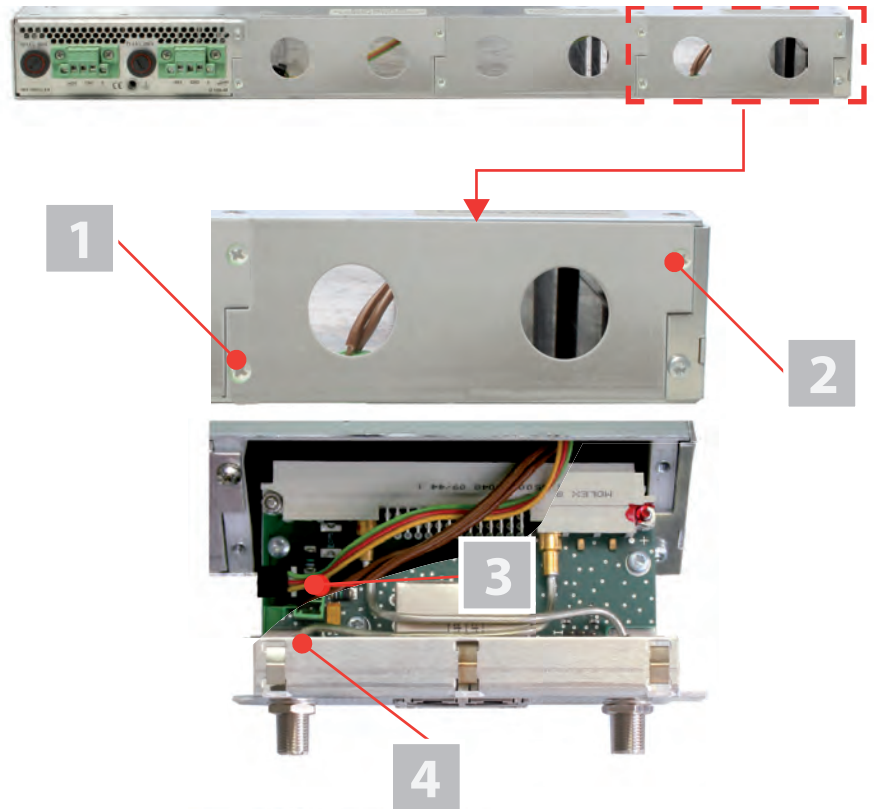


Figure 3: Installing the backplane in the base unit

#### AUFGABE

1. When the U 100 base unit is in its delivery state, the three installation slots for the backplanes are covered by dummy plates (see figure 3, above). Start by removing the Phillips-head screws [1] and [2] from the dummy plate at the required installation position (left, middle or right) and remove the dummy plate.
2. You can now see the two connection cables for the selected slot (power supply and signal cable). Connect the cables to the backplane as shown in figure 3 (above).
3. Now carefully insert the backplane into the slot of the U 100. Make sure the cables are not jammed. You can push the backplane into the housing by applying light pressure.

#### ERGEBNIS:

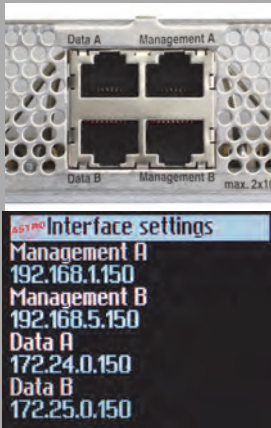
The backplane is now connected and installed. Once installed, it should correspond to the figure at the left.



## Quick start - starting operation of the device

### Connecting the U 168 or U 168-X to a PC or laptop

To be able to configure the device, you now need to connect the network sockets (Management A or Management B) on the backplane of the device (see figure at left) to your PC or laptop using a network cable.



Once you have connected the base unit to the power supply, the U 168 will switch on automatically. Once it has booted (approx. 90 seconds), the ASTRO logo initially appears in the display. Turn the knob to the right of the display clockwise until the menu item "Interface settings" is displayed. The two management IP addresses (Management A and Management B) for the device now appear in the upper lines. Make a note of the address of the management connection which you are using for your PC or laptop to ensure you can enter this in the address line of your web browser later on.

**HINWEIS:** Please note that your PC or laptop must be in the same sub-network as the U 168! The sub-network mask of the U 168 is set to 255.255.255.0 upon delivery. The PC or laptop which is connected must therefore be assigned an IP address 192.168.1.x.

You can now start the configuration using the web browser user interface.

### General information on the structure of the web browser interface

The configuration interface is divided into the following sub-areas:

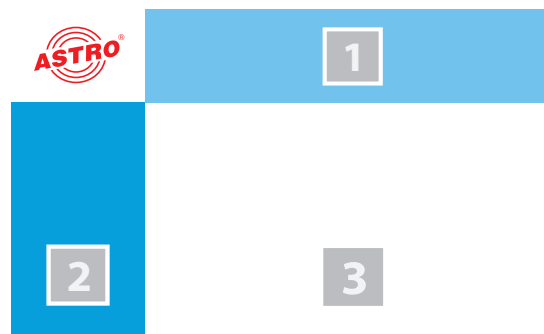


Figure 4: Structure of the web browser interface

- ☐ **Status line (header) [1]:** displays general information on the module.  
SW: Software status  
HW: Hardware version  
Up: Runtime since the system was booted  
Time: Date and time  
Name, location, contact: corresponds to the settings which were made in the "User settings" configuration area
- ☐ **Navigation menu [2]:** displays the individual configuration areas which can be selected by clicking the mouse. A detailed description of these areas can be found on the following pages of this chapter.
- ☐ **Content area [3]:** The respective configuration form – depending on the menu item selected – is displayed here.

**HINWEIS:** The browser display is not updated automatically. Use the corresponding button in the menu of your browser to update the display.



Logging in

To log in, enter the IP address of the device, which appears in the device display, in the address line of the browser. The menu page “Status” will then appear. Select the item “Log in” from the navigation menu at the left. The input mask for the log in should then appear (see figure 6, below). In delivery state, you must use the following log-in data:

- ☐ **User name:** “user” or “admin” (input without inverted commas)
- ☐ **Password:** astro

User Authentication

| Username             | Password                 |
|----------------------|--------------------------|
| <input type="text"/> | <input type="password"/> |

Remember that the session will be timed out after 5 minutes of inactivity.

Figure 5: Log in

After logging in, the start page of the device with all relevant system information will appear. The navigation menu and the log-in status display will appear at the left.

Only one user can be logged into the user interface of the device at a time. The current user is displayed in the column at the left, below the menu.

The device status is indicated by a green or red circle. If a green circle is displayed, the device is operational. If the circle is red, then a fault has occurred.

A list of current errors is available under the menu item “Active alarms”.

***HINWEIS:** For reasons of security, you should change the access data valid upon delivery (user name and password) to prevent unauthorised access!  
The procedure is described in the section “Changing user data”.*

Changing the IP address

***HINWEIS:** If you wish to change the IP address, then the settings on the PC must be changed accordingly.*

Start by changing the IP addresses for the management and the data port. To do so, click on the item “Main” in the menu at the left. You will now see the following table in the content area:

| IP Interface Settings |   |   |  |  |
|-----------------------|---|---|--|--|
| Property              | Management A (eth0)   | Management B (eth1)   | Data A (eth2)  | Data B (eth3)  |
| MAC                   | 00:17:72:02:00:d0   | 00:17:72:03:00:d0   | 00:17:72:04:00:d0  | 00:17:72:05:00:d0  |
| Active                | <input checked="" type="radio"/> on <input type="radio"/> off   | <input checked="" type="radio"/> on <input type="radio"/> off   | <input checked="" type="radio"/> on <input type="radio"/> off  | <input checked="" type="radio"/> on <input type="radio"/> off  |
| Mode                  | 1 Gbit/s, full duplex   | 1 Gbit/s, full duplex   | 1 Gbit/s, full duplex  | 1 Gbit/s, full duplex  |
| Address               | <input type="text" value="192"/> <input type="text" value="168"/> <input type="text" value="1"/> <input type="text" value="150"/> | <input type="text" value="192"/> <input type="text" value="168"/> <input type="text" value="5"/> <input type="text" value="150"/> | <input type="text" value="172"/> <input type="text" value="24"/> <input type="text" value="0"/> <input type="text" value="150"/>   | <input type="text" value="172"/> <input type="text" value="25"/> <input type="text" value="0"/> <input type="text" value="150"/>   |
| Subnet                | <input type="text" value="255"/> <input type="text" value="255"/> <input type="text" value="255"/> <input type="text" value="0"/> | <input type="text" value="255"/> <input type="text" value="255"/> <input type="text" value="255"/> <input type="text" value="0"/> | <input type="text" value="255"/> <input type="text" value="255"/> <input type="text" value="0"/> <input type="text" value="0"/>    | <input type="text" value="255"/> <input type="text" value="255"/> <input type="text" value="0"/> <input type="text" value="0"/>    |
| Broadcast             | <input type="text" value="192"/> <input type="text" value="168"/> <input type="text" value="1"/> <input type="text" value="255"/> | <input type="text" value="192"/> <input type="text" value="168"/> <input type="text" value="5"/> <input type="text" value="255"/> | <input type="text" value="172"/> <input type="text" value="24"/> <input type="text" value="255"/> <input type="text" value="255"/> | <input type="text" value="172"/> <input type="text" value="25"/> <input type="text" value="255"/> <input type="text" value="255"/> |
| Gateway               | <input type="text" value="192"/> <input type="text" value="168"/> <input type="text" value="1"/> <input type="text" value="100"/> | <input type="text" value="0"/> <input type="text" value="0"/> <input type="text" value="0"/> <input type="text" value="0"/>       | <input type="text" value="0"/> <input type="text" value="0"/> <input type="text" value="0"/> <input type="text" value="0"/>        | <input type="text" value="0"/> <input type="text" value="0"/> <input type="text" value="0"/> <input type="text" value="0"/>        |

Figure 6: Changing the IP address

You can enter the IP addresses for management ports A and B as well as for data ports A and B in the “Address” line. Make sure that you activate the ports being used by activating the corresponding radio button in the line “Active”.

To save your changes, click on the “Submit” button below the last table.

More information on configuring the IP address can be found in the section “Configuring IP interfaces, IP management and base unit”.

## The signal flow in the U 168 and U 168-X

The overview on page 11 shows the possible signal paths for the U 168 and U 168-X. The specific signal flow can be divided into the following sub-areas:

- ☐ Two DVB-C/T/T2 signals can be fed in using the two F sockets. The input signal for the first socket (RF 1) is always conveyed to the first frontend, while the second front end can receive the signal from either the first or second input socket (RF 1 or RF 2).
- ☐ Four reception channels (Ch 1.1 - 1.4 and Ch 2.1 - 2.4) can be configured for each of the two frontends.
- ☐ The signals from the reception channels are forwarded to one of the 8 IP transmitters (TX 1 - TX 8) in total via a multiplexer (TX Mux) (the overview shows, as an example, the signal from Ch 1.2 to TX 5, the signal from Ch 1.3 to TX 7 and the signal from Ch 2.2 to TX 8; see the red line connecting them).
- ☐ Each of the output signals from the 8 IP transmitters can be forwarded to data port A and/or data port B respectively.

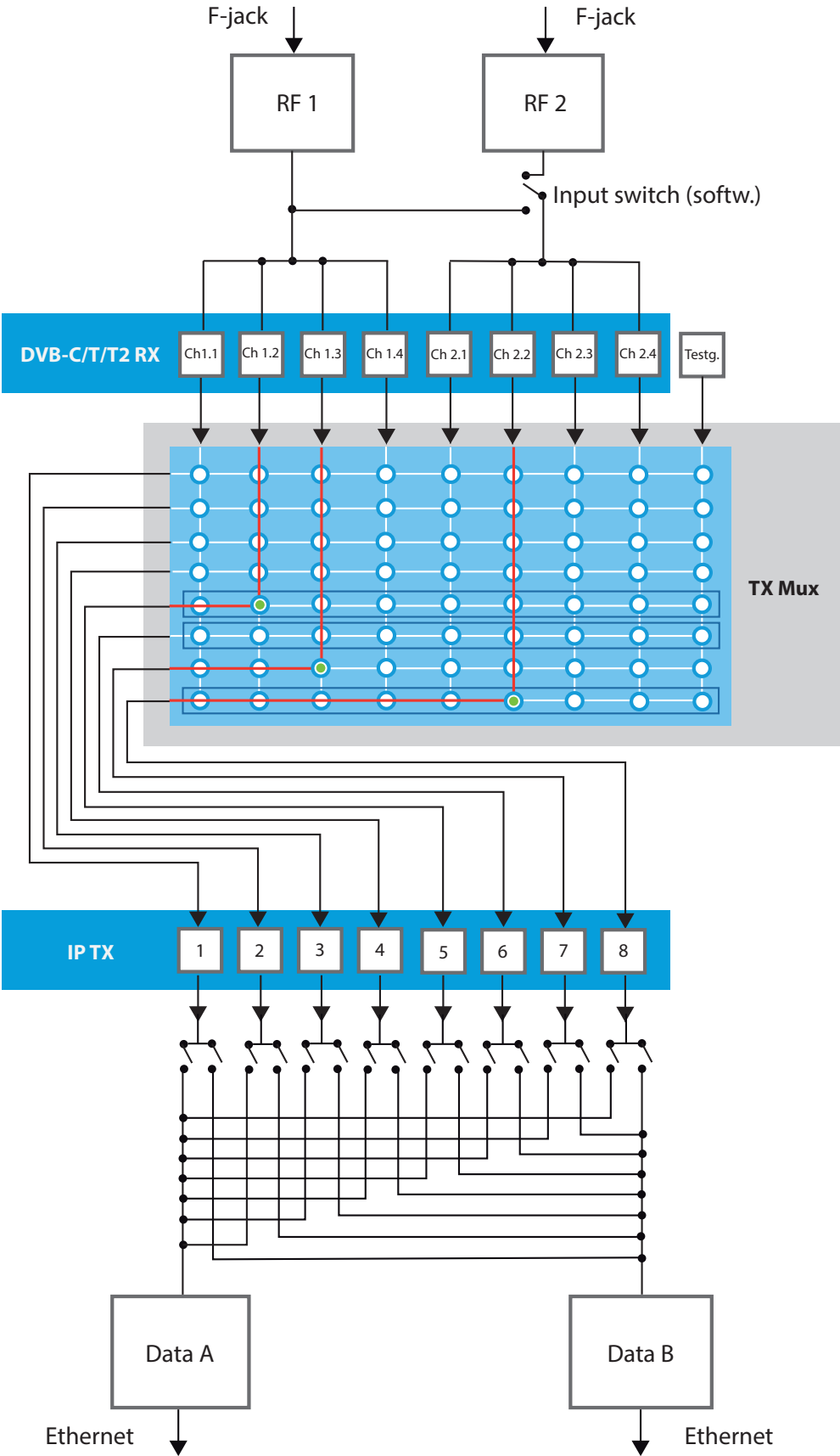


Figure 7: The signal flow in the U 168 and U 168-X

## Configuring DVB-C/T/T2 receivers

Now start configuring a signal path in the device. Start by clicking on the item “Ch.1.1” in the menu in the web browser interface to have the parameters for the first reception channel displayed. You will now see the following table:

### DVB-T/T2/C Channel Setup

| Channel Parameters |   |
|--------------------|---|
| Channel Number     | 1.1   |
| Channel Status     | ok  |
| RF Input           | RF1   |
| Channel enabled    | <input checked="" type="radio"/> on <input type="radio"/> off                         |
| DVB System         | DVB-T ▼   |
| Center Frequency   | 26 (514 MHz) ▼  |
|                    | manual freq.: <input type="text"/> kHz  |
| Tune Offset        | 0 <input type="text"/> kHz  |
| Tuning parameters  | <input checked="" type="radio"/> Auto <input type="radio"/> Manual (Parameters below) |

Figure 8: Selecting a reception system

Activate the radio button “on” – if this has not already been activated – in the “Channel enabled” line. This switches on the reception channel. Now select the preferred reception system (DVB-C, DVB-T or DVB-T2) from the drop-down menu in the “DVB System” line. You can enter general reception parameters first in the lines which follow.

Depending on the selection made for the reception system, you can now set specific parameters relating to the reception system in one of the following tables.

| DVB-C Parameters        |                        |
|-------------------------|------------------------|
| Symbol Rate (Bandwidth) | < 6.96 MBaud (8 MHz) ▼ |

| DVB-T Parameters  |         |
|-------------------|---------|
| Channel Bandwidth | 8 MHz ▼ |
| Guard Interval    | 1/8 ▼   |
| Mode              | 8K ▼    |
| Profile           | HP ▼    |

| DVB-T2 Parameters |                        |
|-------------------|------------------------|
| Channel Bandwidth | 8 MHz ▼                |
| PLP               | 0 <input type="text"/> |

Figure 9: Setting specific reception parameters

To save your changes, click on the “Submit” button below the table.



Checking the channel status

Now click on the item “Ch. 1.1” in the menu at the left. You will now see the following overview:

DVB-T/T2/C Channel Setup

| Channel Parameters |   |
|--------------------|---|
| Channel Number     | 1.1   |
| Channel Status     | ok  |
| RF Input           | RF1   |
| Channel enabled    | <input type="radio"/> on <input checked="" type="radio"/> off                         |
| DVB System         | DVB-T   |
| Center Frequency   | 26 (514 MHz)  |
|                    | manual freq.: <input type="text"/> kHz  |
| Tune Offset        | 0 <input type="text"/> kHz  |
| Tuning parameters  | <input checked="" type="radio"/> Auto <input type="radio"/> Manual (Parameters below) |

Figure 10: Displaying channel parameters

The message “OK” should now appear in the “Channel status” line in the “DVB/T/T2C Channel Setup” table.

Now check the most important parameters in the table which follows, “Channel status”.

Channel Status

|                 |            |
|-----------------|------------|
| System          | DVB-T      |
| Tuned Frequency | 514000 kHz |
| Bandwidth       | 8 MHz      |
| Carrier Offset  | 6 kHz      |
| Tuner Level     | 68.50 dBµV |
| TS Locked       | yes        |
| SNR             | 26.87 dB   |
| Quality         | 100        |
| C/N Value       | 35.70      |
| RS Error        | 0          |
| Constellation   | 16QAM      |
| Guard Interval  | 1/4        |
| Mode            | 8K         |
| MER             | 31.02 dB   |
| Pre-RS BER      | 0.00e+00   |
| Pre-Viterbi BER | 0.00e+00   |

Figure 11: Reception channel status

Ensure that you check the values in the “Quality”, “Tuner Level” and “C/N” lines here.

## Setting the signal routing to the IP transmitters

You can now connect the reception signal to an IP transmitter. To do so, click on the item "TX Mux" in the web browser interface menu. You will now see the following table:

**TX Mux Settings**

| Alias     | TODO                             | TODO                             | TODO                             | TODO                             | TODO                             | TODO                             | TODO                             | TODO                             | ASTRO                 |
|-----------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|-----------------------|
| TSID      | TO                               | TO                               | TO                               | TO                               | TO                               | TO                               | TO                               | TO                               | 65535                 |
| ONID      | DO                               | DO                               | DO                               | DO                               | DO                               | DO                               | DO                               | DO                               | 65535                 |
|           | DVBC/T<br>RX1.1                  | DVBC/T<br>RX1.2                  | DVBC/T<br>RX1.3                  | DVBC/T<br>RX1.4                  | DVBC/T<br>RX2.1                  | DVBC/T<br>RX2.2                  | DVBC/T<br>RX2.3                  | DVBC/T<br>RX2.4                  | Test<br>Gen.          |
| IP<br>TX1 | <input checked="" type="radio"/> | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/> |
| IP<br>TX2 | <input type="radio"/>            | <input checked="" type="radio"/> | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/> |
| IP<br>TX3 | <input type="radio"/>            | <input type="radio"/>            | <input checked="" type="radio"/> | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/> |
| IP<br>TX4 | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input checked="" type="radio"/> | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/> |
| IP<br>TX5 | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input checked="" type="radio"/> | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/> |
| IP<br>TX6 | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input checked="" type="radio"/> | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/> |
| IP<br>TX7 | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input checked="" type="radio"/> | <input type="radio"/>            | <input type="radio"/> |
| IP<br>TX8 | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input type="radio"/>            | <input checked="" type="radio"/> | <input type="radio"/> |

Submit Reset Form

Figure 12: Signal routing to the IP transmitters

In the switch matrix, click on the radio button which connects the receiver IP DVB-C/T RX1 to the IP transmitter IP TX 1.

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

More information about signal routing can be found in the "Menu TX Mux" chapter.

## Configuring the IP transmitter

To complete the process, you should now configure and activate the IP transmitter. To do so, click on

Submit

ResetForm

the item “IP TX 1” in the web browser interface menu. You will now see the following table:

IP TX1 Channel Settings

| Property                | Data A (eth2) 1G  | Data B (eth3) 1G  |
|-------------------------|---|---|
| Enable                  | <input checked="" type="radio"/> on <input type="radio"/> off | <input checked="" type="radio"/> on <input type="radio"/> off |
| Transmit IP:Port        | <div>1722401500</div>   | <div>1722501500</div>   |
| Destination IP:Port     | <div>2322210012810000</div>                                   | <div>2322110012810000</div>                                   |
| Destination MAC         | 01:00:5e:16:64:80   | 01:00:5e:15:64:80   |
| TOS / TTL               | <div>1841</div>   | <div>1841</div>   |
| VLAN (Set 0 to disable) | <div>0</div>  | <div>0</div>  |

Enter the IP address and UDP port that the traffic is to be sent to.  
For an IP multicast, use an address in the range 224.0.0.0 to 239.255.255.255.  
The TOS and TTL entries are the values used for the IP "Type of Service" and "Time To Live" fields

| Property                             | Data A (eth2) + Data B (eth3)  |
|--------------------------------------|--|
| TS Packets per Frame                 | <div>7</div>   |
| Protocol Encapsulation               | <input checked="" type="radio"/> RTP/UDP/IP <input type="radio"/> UDP/IP |
| FEC (L Cols / D Rows / Interleaving) | <div>Off</div> <div>Off</div> <div>Col only</div> <div>Plain</div>       |

Figure 13: Configuring the IP transmitter

In the line “Destination IP Port”, enter the IP address of a reception device (e.g. for one of the signal converters from the U 1xx series).

In the table at the top, click on the radio button “on” to activate signal transmission to one of the data ports A or B.

To save your changes, click on the “Submit” button below the table.

More information on setting the IP transmitters can be found in the section “IP TX menu”.

Checking the data transmission rate

Now click on the item “Statistics” in the menu at the left. You will now see the following overview:

Ethernet bandwidth

| Property | Management A (eth0) 1G full | Management B (eth1) 1G full | Data A (eth2) 1G full | Data B (eth3) 1G full |
|----------|-----------------------------|-----------------------------|-----------------------|-----------------------|
| Transmit | 0.0 Mbit/s                  | 0.0 Mbit/s                  | 57.5 Mbit/s           | 0.0 Mbit/s            |
| Receive  | 0.0 Mbit/s                  | 0.0 Mbit/s                  | 0.0 Mbit/s            | 0.0 Mbit/s            |

Ethernet frames

| Property  | Data A (eth2) 1G | Data B (eth3) 1G |
|---|------------------|------------------|
| Total frames sent by host                               | 2                | 0                |
| Total frames sent to host                               | 3                | 54               |
| Total exception frames sent to host                     | 19               | 2                |
| Total errored frames received                           | 0                | 0                |
| Total frames discarded by deencapsulator                | 0                | 0                |
| Total frames discarded because of lack of buffers       | 0                | 0                |
| Total transmit frames generated from IP TX 1 / per sec. | 107441 / 1260    | 0 / 0            |
| Total transmit frames generated from IP TX 2 / per sec. | 120496 / 1417    | 0 / 0            |
| Total transmit frames generated from IP TX 3 / per sec. | 106750 / 1260    | 0 / 0            |
| Total transmit frames generated from IP TX 4 / per sec. | 106461 / 1260    | 0 / 0            |

Ethernet TX

Figure 14: IP transmitter statistics

A value > 0 should now appear for the data transmission rate in the line “Transmit” in the “Ethernet

bandwidth" table.

A corresponding value should appear in the line "Total transmit frames generated from IP TX 1" in the "Ethernet frames" table.

More information about the values in the "Statistics" overview can be found in the section "Statistics menu".

Once you have successfully completed all the steps described, then the most important settings required to decrypt a data stream have been entered in the device.

To ensure error statuses entered in the log book are easy to follow, you should configure a time source.

This can be done under the menu item "Main" in the

"IP Management Settings" table (also see the section "Main Menu").

## "Status" menu

To have the current settings for the device displayed, click on the **Status** item in the menu at the left. You can now see the overview shown in figure 18:

### Ethernet

| Property | Management A (eth0)   | Management B (eth1) | Data A (eth2)         | Data B (eth3)     |
|----------|-----------------------|---------------------|-----------------------|-------------------|
| MAC      | 00:17:72:02:16:da     | 00:17:72:03:16:da   | 00:17:72:04:16:da     | 00:17:72:05:16:da |
| Address  | 192.168.1.178         | 192.168.5.178       | 172.24.0.178          | 172.25.0.178      |
| Netmask  | 255.255.255.0         | 255.255.255.0       | 255.255.0.0           | 255.255.0.0       |
| Gateway  | 192.168.1.100         | 0.0.0.0             | 0.0.0.0               | 0.0.0.0           |
| Mode     | 1 Gbit/s, full duplex | Off                 | 1 Gbit/s, full duplex | Off               |
| Transmit | 0.0 Mbit/s            | 0.0 Mbit/s          | 57.5 Mbit/s           | 0.0 Mbit/s        |
| Receive  | 0.0 Mbit/s            | 0.0 Mbit/s          | 0.0 Mbit/s            | 0.0 Mbit/s        |

### DVB-T/T2/C Channels

| Ch. | System | Input | Frequency | Tuner Level | C/N      | SNR      | Status |
|-----|--------|-------|-----------|-------------|----------|----------|--------|
| 1.1 | DVB-T  | RF1   | 514 MHz   | 66.00 dBµV  | 35.70 dB | 26.97 dB | ok     |
| 1.2 | DVB-T  | RF1   | 698 MHz   | 64.50 dBµV  | 32.50 dB | 28.97 dB | ok     |
| 1.3 | DVB-T  | RF1   | 706 MHz   | 64.50 dBµV  | 35.70 dB | 27.27 dB | ok     |
| 1.4 | DVB-T  | RF1   | 730 MHz   | 57.50 dBµV  | 31.70 dB | 27.77 dB | ok     |
| 2.1 | DVB-T  | RF1   | 514 MHz   | 73.50 dBµV  | 35.20 dB | 27.27 dB | ok     |
| 2.2 | DVB-T  | RF1   | 698 MHz   | 69.00 dBµV  | 32.50 dB | 28.77 dB | ok     |
| 2.3 | DVB-T  | RF1   | 730 MHz   | 64.50 dBµV  | 31.50 dB | 27.47 dB | ok     |
| 2.4 | DVB-T  | RF1   | 706 MHz   | 70.00 dBµV  | 36.70 dB | 26.87 dB | ok     |

### IP TX Channels

| Channel | Port | TX IP socket         | Encapsulation                         | FEC | TSID ONID | Alias | Status |
|---------|------|----------------------|---------------------------------------|-----|-----------|-------|--------|
| IP TX1  | A    | 232.16.100.128:10000 | 1328 bytes<br>7 packets<br>RTP/UDP/IP | off | 0<br>0    |       | ok     |
|         | B    | 232.25.100.178:10000 |                                       |     |           |       | off    |
| IP TX2  | A    | 232.16.100.129:10000 | 1328 bytes<br>7 packets<br>RTP/UDP/IP | off | 0<br>0    |       | ok     |
|         | B    | 232.22.100.129:10000 |                                       |     |           |       | off    |
| IP TX3  | A    | 232.16.100.130:10000 | 1328 bytes<br>7 packets<br>RTP/UDP/IP | off | 0<br>0    |       | ok     |
|         | B    | 232.22.100.130:10000 |                                       |     |           |       | off    |
| IP TX4  | A    | 232.16.100.131:10000 | 1328 bytes<br>7 packets<br>RTP/UDP/IP | off | 0<br>0    |       | ok     |
|         | B    | 232.22.100.131:10000 |                                       |     |           |       | off    |

Figure 15: Status display

The following tables are displayed:

### Ethernet status:

Configuration data and status of the Ethernet port

### Ethernet

| Property | Management A (eth0)   | Management B (eth1) | Data A (eth2)         | Data B (eth3)     |
|----------|-----------------------|---------------------|-----------------------|-------------------|
| MAC      | 00:17:72:02:16:da     | 00:17:72:03:16:da   | 00:17:72:04:16:da     | 00:17:72:05:16:da |
| Address  | 192.168.1.178         | 192.168.5.178       | 172.24.0.178          | 172.25.0.178      |
| Netmask  | 255.255.255.0         | 255.255.255.0       | 255.255.0.0           | 255.255.0.0       |
| Gateway  | 192.168.1.100         | 0.0.0.0             | 0.0.0.0               | 0.0.0.0           |
| Mode     | 1 Gbit/s, full duplex | Off                 | 1 Gbit/s, full duplex | Off               |
| Transmit | 0.0 Mbit/s            | 0.0 Mbit/s          | 57.5 Mbit/s           | 0.0 Mbit/s        |
| Receive  | 0.0 Mbit/s            | 0.0 Mbit/s          | 0.0 Mbit/s            | 0.0 Mbit/s        |

Figure 16: Status display - Ethernet

The values for the following parameters are displayed and configured here respectively in accordance with the four connections on the backplane of the device (Data A, Data B, Management A and Management B, see section "Device description").

- ☐ MAC: MAC address (display value)
- ☐ Address: IP address (configurable)
- ☐ Netmask: Net mask (configurable)
- ☐ Gateway: Gateway IP address (configurable)
- ☐ Mode: Ethernet mode (display value)
- ☐ Transmit: Data transmission rate (display value)
- ☐ Receive: Data reception rate (display value)

#### Status display of the DVB-C/T/T2 reception channels:

##### DVB-T/T2/C Channels

| Ch. | System | Input | Frequency | Tuner Level | C/N      | SNR      | Status |
|-----|--------|-------|-----------|-------------|----------|----------|--------|
| 1.1 | DVB-T  | RF1   | 514 MHz   | 66.00 dBμV  | 35.70 dB | 26.97 dB | ok     |
| 1.2 | DVB-T  | RF1   | 698 MHz   | 64.50 dBμV  | 32.50 dB | 28.97 dB | ok     |
| 1.3 | DVB-T  | RF1   | 706 MHz   | 64.50 dBμV  | 35.70 dB | 27.27 dB | ok     |
| 1.4 | DVB-T  | RF1   | 730 MHz   | 57.50 dBμV  | 31.70 dB | 27.77 dB | ok     |
| 2.1 | DVB-T  | RF1   | 514 MHz   | 73.50 dBμV  | 35.20 dB | 27.27 dB | ok     |
| 2.2 | DVB-T  | RF1   | 698 MHz   | 69.00 dBμV  | 32.50 dB | 28.77 dB | ok     |
| 2.3 | DVB-T  | RF1   | 730 MHz   | 64.50 dBμV  | 31.50 dB | 27.47 dB | ok     |
| 2.4 | DVB-T  | RF1   | 706 MHz   | 70.00 dBμV  | 36.70 dB | 26.87 dB | ok     |

Figure 17: Status display – DVB-T/T2/C channels

The "DVB-T/T2/C channels" table displays the values set for the reception channels (channel 1.1. - 1.4 and 2.1 - 2.4) in the following parameters:

- ☐ System: Reception system selected
- ☐ Input: HF input selected
- ☐ Frequency: Reception frequency set
- ☐ Tuner Level: Input level selected
- ☐ C/N: Carrier-to-noise ratio
- ☐ SNR: Signal-to-noise ratio

Details on the parameters can be found in the section "Menu Ch. X.X".



## Status display of the IP transmitters:

### IP TX Channels

| Channel | Port | TX IP socket         | Encapsulation           | FEC | TSID<br>ONID | Alias | Status |
|---------|------|----------------------|-------------------------|-----|--------------|-------|--------|
| IP TX1  | A    | 232.16.100.128:10000 | 1328 bytes<br>7 packets | off | 0<br>0       |       | ok     |
|         | B    | 232.25.100.178:10000 | RTP/UDP/IP              |     |              |       | off    |
| IP TX2  | A    | 232.16.100.129:10000 | 1328 bytes<br>7 packets | off | 0<br>0       |       | ok     |
|         | B    | 232.22.100.129:10000 | RTP/UDP/IP              |     |              |       | off    |
| IP TX3  | A    | 232.16.100.130:10000 | 1328 bytes<br>7 packets | off | 0<br>0       |       | ok     |
|         | B    | 232.22.100.130:10000 | RTP/UDP/IP              |     |              |       | off    |
| IP TX4  | A    | 232.16.100.131:10000 | 1328 bytes<br>7 packets | off | 0<br>0       |       | ok     |
|         | B    | 232.22.100.131:10000 | RTP/UDP/IP              |     |              |       | off    |

Figure 18: Status display - IP TX channels

The values set for the following parameters are displayed in the table “IP TX Settings” for the four IP transmitters – for port A and B respectively:

- ☐ TX IP socket: Destination IP address/port
- ☐ Encapsulation: Data encapsulation
- ☐ FEC: Forward error correction
- ☐ TSID/ONID: Transport stream ID / original network ID
- ☐ Alias: Alias name

Details on the parameters can be found in the section “Menu IPTX”.

## Status display on temperature, internal voltages and the power module:

### Miscellaneous

| Property     | Mainboard | DVBC/T[1..4] | DVBC/T[5..8] |
|--------------|-----------|--------------|--------------|
| Temperature  | 53.0 °C   | 48.5 °C      | 36.5 °C      |
| Supply 1.2 V | 1.19 V    | 1.19 V       | 1.19 V       |
| Supply 1.8 V | 1.80 V    | n/a          | n/a          |
| Supply 2.5 V | 2.48 V    | 2.48 V       | 2.48 V       |
| Supply 3.3 V | 3.29 V    | 3.33 V       | 3.31 V       |
| Supply 5.2 V | 5.17 V    | n/a          | n/a          |
| Supply 13 V  | 12.88 V   | n/a          | n/a          |
| Fan          | 9782 RPM  | n/a          | n/a          |
| Supply 5.0 V | n/a       | 5.12 V       | 5.20 V       |

Figure 19: Status display - Miscellaneous

The following, general parameters are displayed in the “Miscellaneous” table:

- ☐ Temperature: Temperature display in °C for the mainboard, as well as DVB-C/T/T2 1 - 4 and 5

- 8.

- ☐ Supply 1.2 V: 1.2 V supply voltage
- ☐ Supply 1.8 V: 1.8 V supply voltage
- ☐ Supply 2.5 V: 2.5 V supply voltage
- ☐ Supply 3.3 V: 3.3 V supply voltage
- ☐ Supply 5.2 V: 5.2 V supply voltage
- ☐ Supply 13 V: 13 V supply voltage (mainboard only)
- ☐ Fan: Fan rotation speed
- ☐ Supply 5.0 V: 5.0 V supply voltage

#### Memory status:

##### System resources

| Property                             | Value    |
|--------------------------------------|----------|
| Total size of memory arena           | 58358812 |
| Number of ordinary memory blocks     | 23       |
| Space used by ordinary memory blocks | 1017904  |
| Space free for ordinary blocks       | 57340884 |
| Size of largest free block           | 57331284 |
| Number of left files FOPEN_MAX       | 59       |
| Number of left files NFILE           | 50       |
| Number of free file descriptors NFD  | 50       |
| CPU load 0.1s                        | 0 %      |
| CPU load 1s                          | 30 %     |
| CPU load 10s                         | 23 %     |

Figure 20: Status display - System resources

Information on the internal resources of the operating system can be viewed in the “System resources” table. No settings can be made here.

## "Main" menu

This section explains how to enter general settings for the interfaces and the management of the device, as well as for the U 100 base unit.  
Click on the item "Main" in the menu at the left.

### Setting the IP interfaces

You can configure IP interfaces and activate or deactivate them using the upper table ("IP interface settings"). The connection type is automatically identified and displayed by the device (in this case: 1 GBit/s, full duplex).

**HINWEIS:** In order to make changes in this table, you must be logged in as the administrator.

IP Interface Settings

| Property  | Management A (eth0)   | Management B (eth1)   | Data A (eth2)   | Data B (eth3)   |
|-----------|---|---|---|---|
| MAC       | 00:17:72:02:00:d0   | 00:17:72:03:00:d0   | 00:17:72:04:00:d0   | 00:17:72:05:00:d0   |
| Active    | <input checked="" type="radio"/> on <input type="radio"/> off | <input checked="" type="radio"/> on <input type="radio"/> off | <input checked="" type="radio"/> on <input type="radio"/> off | <input checked="" type="radio"/> on <input type="radio"/> off |
| Mode      | 1 Gbit/s, full duplex   | 1 Gbit/s, full duplex   | 1 Gbit/s, full duplex   | 1 Gbit/s, full duplex   |
| Address   | 192 168 1 150   | 192 168 5 150   | 172 24 0 150  | 172 25 0 150  |
| Subnet    | 255 255 255 0   | 255 255 255 0   | 255 255 0 0   | 255 255 0 0   |
| Broadcast | 192.168.1.255   | 192.168.5.255   | 172.24.255.255  | 172.25.255.255  |
| Gateway   | 192 168 1 100   | 0 0 0 0   | 0 0 0 0   | 0 0 0 0   |

Figure 21: Configuring IP interfaces

The following parameters are displayed, and can be configured:

- ☐ MAC: MAC address of the respective interface
- ☐ Active: Activate the radio button "on" to activate the interface. Activate the radio button "off" to deactivate the interface.
- ☐ Mode: Connection type (identified automatically)
- ☐ Address: IP address
- ☐ Subnet: Netmask
- ☐ Broadcast: Broadcast address (calculated)
- ☐ Gateway: Gateway IP (if available; otherwise, set this to 0.0.0.0)

**HINWEIS:** When programming the IP addresses, make sure the addresses have not already been allocated within your network. Address conflicts result in network malfunctions. (Please set unused parameters to 0.0.0.0.)

To save your changes, click on the "Submit" button below the last table.

### Configuring management settings

You can configure the following management settings in the second table ("IP management settings"):

IP Management Settings

| Property    | Value           |
|-------------|-----------------|
| DNS         | 0 0 0 0         |
| SNTP server | 0.0.0.0 0.0.0.0 |
| Time Source | SNTP Server     |

Figure 22: Configuring management settings

Submit

Reset Form

- ☐ DNS: Enter a DNS server, if required, in the input fields.
- ☐ SNTP server: You can enter one or two time servers here (SNTP protocol).
- ☐ Time Source: "SNTP server" is set here as the default option.

To save your changes, click on the "Submit" button below the last table.

### Configuring the base unit

You can enter settings for the U 100 base unit in the third table ("U 100 Rack settings").

#### U100 Rack Settings

| Property      | Value                            |
|---------------|----------------------------------|
| Base Address  | <input type="text" value="0"/>   |
| Slot Address  | <input type="text" value="2"/>   |
| Power Modules | <input type="text" value="0"/> ▼ |

Figure 23: Configuring the U 100 base unit

The following parameters are displayed, and can be configured:

- ☐ Base Address: Enter an address for the base unit being used here. If the device is managed using the U 100-C controller and several U 100 base units are being used, then each base unit must be allocated an address of its own. This setting only has to be entered for one module per base unit.
- ☐ Slot Address: In accordance with the coding of the backplane of the device performed previously (see section "Installing and connecting"), the address corresponding to the slot in the base unit is displayed here.
- ☐ Power Modules: Select the number of power modules being monitored from the drop-down menu

To save your changes, click on the "Submit" button below the last table.

## Saving and loading configurations / default and reboot

Save settings to flash / Load settings from flash / Default settings / Reboot system

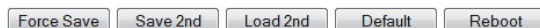


Figure 24: Saving and loading configurations

Changes to the configuration of the device are written to the device by clicking the "Submit" button, and are activated immediately. If you wish to save the current status to a separate memory, click on the "Save 2nd" button (below the tables). This current status is then saved to the SD card in the device. By clicking on the "Load 2nd" button, you can query this status again. How to save the configuration onto the local computer or FTP server is explained in the section "Software update and configuration files". When you click the "Force Save" button, all settings are saved immediately. The time settings for automatically saving changes are then overridden.

Click on the "Default" button if you wish to restore the default settings.

**ACHTUNG:** *If you click the "Default" button, all settings except for the user and network settings for the data and management ports are reset to the delivery state.*

Click on the "Reboot" button to restart the unit with the last settings saved.

## "Channels" menu

To have an overview of the settings for the individual reception channels displayed, click on the item "Channels" in the menu at the left.

### Checking the settings for the DVB-C/T/T2

You can check the settings for the input channels in the upper table, "DVB-T/T2/C Channel overview", and activate or deactivate the individual channels.

DVB-T/T2/C Channel overview

| Ch. | Enable  | System | Input | Frequency | Tuner Level | C/N      | SNR      | Status |
|-----|---|--------|-------|-----------|-------------|----------|----------|--------|
| 1.1 | <input checked="" type="radio"/> on <input type="radio"/> off | DVB-T  | RF1   | 514 MHz   | 66.00 dBµV  | 35.40 dB | 27.07 dB | ok     |
| 1.2 | <input checked="" type="radio"/> on <input type="radio"/> off | DVB-T  | RF1   | 698 MHz   | 65.00 dBµV  | 33.10 dB | 28.77 dB | ok     |
| 1.3 | <input checked="" type="radio"/> on <input type="radio"/> off | DVB-T  | RF1   | 706 MHz   | 65.00 dBµV  | 35.50 dB | 27.27 dB | ok     |
| 1.4 | <input checked="" type="radio"/> on <input type="radio"/> off | DVB-T  | RF1   | 730 MHz   | 57.50 dBµV  | 32.30 dB | 27.67 dB | ok     |
| 2.1 | <input checked="" type="radio"/> on <input type="radio"/> off | DVB-T  | RF1   | 514 MHz   | 71.00 dBµV  | 34.80 dB | 26.97 dB | ok     |
| 2.2 | <input checked="" type="radio"/> on <input type="radio"/> off | DVB-T  | RF1   | 698 MHz   | 70.00 dBµV  | 33.10 dB | 28.97 dB | ok     |
| 2.3 | <input checked="" type="radio"/> on <input type="radio"/> off | DVB-T  | RF1   | 730 MHz   | 64.50 dBµV  | 32.80 dB | 27.37 dB | ok     |
| 2.4 | <input checked="" type="radio"/> on <input type="radio"/> off | DVB-T  | RF1   | 706 MHz   | 69.50 dBµV  | 35.20 dB | 27.37 dB | ok     |

RF Input Settings

|                   | Channel 1.x   | Channel 2.x  |
|-------------------|---|--|
| Input Attenuator  | 0.0 dB  | 0.0 dB   |
| RF Input          | RF1   | <input checked="" type="radio"/> RF1 <input type="radio"/> RF2 |
| RF Supply Voltage | <input checked="" type="radio"/> off <input type="radio"/> on | <input type="radio"/> off <input checked="" type="radio"/> on  |

Submit

Reset Form

Figure 25: "DVB-T/T2/C Channel overview" and "RF Input Settings" tables

The signal forwarding to the multiplexer (TX Mux) can be activated or deactivated respectively in the "Enable" column by clicking the corresponding radio button.

The following parameters are displayed for the 2 times 4 reception channels (Ch 1.1 - 1.4 and Ch 2.1 - 2.4) respectively:

- ☐ System Input: Display of the reception system selected and the input signal received (for reception channels Ch 1.1 - 1.4, this is always RF 1; for Ch 2.1 - 2.4, this is either RF 1 or RF 2)
- ☐ Frequency: Reception frequency selected
- ☐ Tuner Level: Output level set for the respective reception channel
- ☐ C/N: Carrier-to-noise ratio
- ☐ SNR: Signal-to-noise ratio

The "RF Input Settings" table which follows allows you to:

- ☐ Enter an input attenuation value for the two front ends respectively
- ☐ Select the input from which the second frontend is fed (RF 1 or RF 2, to do so, activate the corresponding radio button)
- ☐ Activate or deactivate the HF supply voltage for the two frontends respectively

If you change the activation or deactivation status of inputs or outputs in one of the two tables, then click on the "Submit" button below the last table to save your changes. Click on "Reset form" to restore the original settings.

Submit

Reset Form



“Ch 1.X - Ch 2.X” menu

To configure the four IP inputs, start by clicking on the item “IP RX1”, “IP RX2”, “IP RX3” or “IP RX4” in the menu at the left. The following table will then appear in the content area at the top:

DVB-T/T2/C Channel Setup

| Channel Parameters |   |
|--------------------|---|
| Channel Number     | 1.1   |
| Channel Status     | ok  |
| RF Input           | RF1   |
| Channel enabled    | <input checked="" type="radio"/> on <input type="radio"/> off                         |
| DVB System         | DVB-T   |
| Center Frequency   | 26 (514 MHz)  |
|                    | manual freq.: <input type="text"/> kHz  |
| Tune Offset        | <input type="text"/> 0 kHz  |
| Tuning parameters  | <input checked="" type="radio"/> Auto <input type="radio"/> Manual (Parameters below) |

DVB-C Parameters

|                         |                      |
|-------------------------|----------------------|
| Symbol Rate (Bandwidth) | < 6.96 MBaud (8 MHz) |
|-------------------------|----------------------|

DVB-T Parameters

|                   |       |
|-------------------|-------|
| Channel Bandwidth | 8 MHz |
| Guard Interval    | 1/8   |
| Mode              | 8K    |
| Profile           | HP    |

DVB-T2 Parameters

|                   |                        |
|-------------------|------------------------|
| Channel Bandwidth | 8 MHz                  |
| PLP               | <input type="text"/> 0 |

Submit

Reset Form

Figure 26: “DVB-T/T2/C Channel Setup” table

- The following settings can also be entered individually:
- ☐ Channel enabled: To activate or deactivate the channel, select the corresponding radio button.
  - ☐ DVB System: Select the preferred reception system from the drop-down menu.
  - ☐ Center Frequency: Select the preferred reception frequency from the drop-down menu. If you select the item “manual” from the list, you can enter the required value, in kHz, in the “manual freq.” input field.
  - ☐ Tune Offset: You can enter a frequency offset to the centre frequency here.
  - ☐ Tuning parameters: Click the corresponding radio button to select whether the reception parameters for the preferred reception system should be set automatically or manually. When you activate “manual”, you can configure the reception parameters in the table in the sections which follow.

#### Setting DVB-C parameters:

☐ Symbol Rate (Bandwidth): Select the preferred symbol rate from the drop-down menu.

#### Setting DVB-T parameters:

☐ Channel Bandwidth: Select the preferred channel bandwidth from the drop-down menu (6, 7 or 8 MHz).

☐ Guard Interval: Select the preferred guard interval from the drop-down menu (1/4, 1/8, 1/16 or 1/32).

☐ Mode: Select the preferred mode from the selection list (2k or 8k).

☐ Profile: Select the preferred profile from the drop-down menu (HP or LP).

Click on the "Submit" button below the last table to save the changes.

Click on "Reset form" to restore the original settings.

The "Channel Status" table which follows provides an overview of the parameters currently set for the selected reception channel (see below).

**Channel Status**

| System          | DVB-T      |
|-----------------|------------|
| Tuned Frequency | 514000 kHz |
| Bandwidth       | 8 MHz      |
| Carrier Offset  | 6 kHz      |
| Tuner Level     | 68.50 dBµV |
| TS Locked       | yes        |
| SNR             | 26.87 dB   |
| Quality         | 100        |
| C/N Value       | 35.70      |
| RS Error        | 0          |
| Constellation   | 16QAM      |
| Guard Interval  | 1/4        |
| Mode            | 8K         |
| MER             | 31.02 dB   |
| Pre-RS BER      | 0.00e+00   |
| Pre-Viterbi BER | 0.00e+00   |

Figure 27: "Channel Status" table

## „Service Filter“ menu

For transport streams TS 1.1 - TS 1.4 and TS 2.1 - 2.4 a service filter can be configured each to delete services from the transport stream. Click on one of the items „TS 1.1 - TS 1.4“ in the Service Filter menu on the left to show up the configuration tables.

### Adjusting the setup for a service filter

In the first table „Service Filter Setup“ you can activate or deactivate the service filter function for the selected service filter by clicking on radio button „on“ or „off“.

Service Filter 1.1 Setup

Enable Filter

Enable

☒ on ☐ off

General Parameters

Bitrate

40000

kBit/s

Unreferenced PIDs

☒ drop ☐ pass

Filter Type

☐ drop ☒ pass

Submit

Reset Form

Figure 28: Table „Service Filter Setup“

When the filter is activated, you can choose an appropriate bit rate in section „General Parameters“ by typing the desired value into the input field. Please note, that the lowest possible bit rate depends on the number of services that the transport stream contains. If the chosen bit rate is too low, some of the services may not be transmitted properly.

If PIDs without referencing are desired to be deleted from the transport stream, click on the radio button „drop“ or choose „pass“, if these PIDs are desired to remain in the transport stream.

In row „Filter Type“ you can choose if the services selected in the next table „Service Selection“ are being deleted from the transport stream (radio button „drop“) or if only the selected services will remain in the transport stream.

After making changes within the table, click on the „Submit“ button below the last table to store your changes. Click on the „Reset Form“ button to restore the original settings.

### Selecting services

In table „Service Selection“ you can choose services by selecting the desired service from the drop down list in column „Select“. The click on the plus symbol to add the service.

Service Selection

| Service |                                       |       | Action |
|---------|---------------------------------------|-------|--------|
| Slot    | Select                                | SID   |        |
| 1       | Das Erste (digital television)        | 28106 | ⊖      |
| 2       | SWR Fernsehen BW (digital television) | 28113 | ⊖      |
| 3       | Manual SID                            | 11130 | ⊖      |
| 4       | Manual SID                            | 11140 | ⊖      |
| 5       | Manual SID                            | 11110 | ⊖      |
|         | Please select                         |       | ⊕      |

Add All

Remove All

Reset Form

Figure 29: Table „Service Selection“

Services, that are added to the selection are marked with a minus symbol in column „Action“. To delete a previously selected service, simply click on the minus symbol of that service.

When handling longer service lists you can simply add all services to the list (click button „Add All“) or delete all selected services at once (click button „Remove All“). Click the „Reset Form“ button to restore the original settings.

In the next table „Status“ you can see an overview of all services with their current status („drop“ or „pass“).

**Status**

| SID   | Service           | Status |
|-------|-------------------|--------|
| 28106 | Das Erste         | pass   |
| 28107 | BR Fernsehen Süd  | drop   |
| 28108 | hr-fernsehen      | drop   |
| 28110 | BR Fernsehen Nord | drop   |
| 28111 | WDR Köln          | drop   |
| 28113 | SWR Fernsehen BW  | pass   |

*Figure 30: Table „Status“*

“IP TX” menu

To have an overview of the 8 IP outputs displayed, start by clicking on the “IP TX” item in the menu at the left. The following table will then appear in the content area:

IP TX Channel Settings

| Channel | Enable   | Length | Packets | Mode       | Destination IP socket                        | UDP src | TOS        | TTL    | VLAN   |
|---------|--|--------|---------|------------|--|---------|------------|--------|--------|
| IP TX1  | Data A: <input checked="" type="radio"/> on <input type="radio"/> off<br>Data B: <input type="radio"/> on <input checked="" type="radio"/> off | 188    | 7       | RTP/UDP/IP | 232.21.100.128:10000<br>232.22.100.128:10000 | 0<br>0  | 184<br>184 | 1<br>1 | 0<br>0 |
| IP TX2  | Data A: <input checked="" type="radio"/> on <input type="radio"/> off<br>Data B: <input type="radio"/> on <input checked="" type="radio"/> off | 188    | 7       | RTP/UDP/IP | 232.21.100.129:10000<br>232.22.100.129:10000 | 0<br>0  | 184<br>184 | 1<br>1 | 0<br>0 |
| IP TX3  | Data A: <input checked="" type="radio"/> on <input type="radio"/> off<br>Data B: <input type="radio"/> on <input checked="" type="radio"/> off | 188    | 7       | RTP/UDP/IP | 232.21.100.130:10000<br>232.22.100.130:10000 | 0<br>0  | 184<br>184 | 1<br>1 | 0<br>0 |
| IP TX4  | Data A: <input checked="" type="radio"/> on <input type="radio"/> off<br>Data B: <input type="radio"/> on <input checked="" type="radio"/> off | 188    | 7       | RTP/UDP/IP | 232.21.100.131:10000<br>232.22.100.131:10000 | 0<br>0  | 184<br>184 | 1<br>1 | 0<br>0 |
| IP TX5  | Data A: <input checked="" type="radio"/> on <input type="radio"/> off<br>Data B: <input type="radio"/> on <input checked="" type="radio"/> off | 188    | 7       | RTP/UDP/IP | 232.21.100.132:10000<br>232.22.100.132:10000 | 0<br>0  | 184<br>184 | 1<br>1 | 0<br>0 |
| IP TX6  | Data A: <input checked="" type="radio"/> on <input type="radio"/> off<br>Data B: <input type="radio"/> on <input checked="" type="radio"/> off | 188    | 7       | RTP/UDP/IP | 232.21.100.133:10000<br>232.22.100.133:10000 | 0<br>0  | 184<br>184 | 1<br>1 | 0<br>0 |
| IP TX7  | Data A: <input checked="" type="radio"/> on <input type="radio"/> off<br>Data B: <input type="radio"/> on <input checked="" type="radio"/> off | 188    | 7       | RTP/UDP/IP | 232.21.100.134:10000<br>232.22.100.134:10000 | 0<br>0  | 184<br>184 | 1<br>1 | 0<br>0 |
| IP TX8  | Data A: <input checked="" type="radio"/> on <input type="radio"/> off<br>Data B: <input type="radio"/> on <input checked="" type="radio"/> off | 188    | 7       | RTP/UDP/IP | 232.21.100.135:10000<br>232.22.100.135:10000 | 0<br>0  | 184<br>184 | 1<br>1 | 0<br>0 |

Submit

Reset Form

Figure 31: “IP TX channel settings” table

The following parameters are displayed for the 8 output channels respectively:

- ☐ Enable: Each of the 8 output signals can be routed to either Ethernet output A or B, or to both Ethernet outputs.  
Activate the radio buttons which correspond to your selection.
- ☐ Length: Packet length
- ☐ Packets: TS packets per IP packet
- ☐ Mode: Protocol encapsulation (RTP/UDP/IP or UDP/IP)
- ☐ Destination IP socket: Destination address/port
- ☐ Protocol Encapsulation: Select either “RTP/UDP/IP” or “UDP/IP” as the protocol by clicking the corresponding radio button.
- ☐ UDP src: UPD source
- ☐ TOS: Type of service
- ☐ VLAN: Virtual LAN ID

Click on the “Submit” button below the last table to save the changes made to the activation/deactivation of channels.  
Click on “Reset form” to restore the original settings.

Submit

Reset Form

## "TX 1..8 (MPTS)" menu

To configure the 8 MPTS channels, start by clicking, in the menu at the left, on the item "TX 1..8 (MPTS)". The following table will then appear in the content area at the top:

IP TX Channel Settings (MPTS)

| Channel | Source                           | Data A   |                     |     |   |   |       | Data B   |                     |     |   |   |       |
|---------|----------------------------------|--|---------------------|-----|---|---|-------|--|---------------------|-----|---|---|-------|
|         |                                  | Enable   | Destination IP:Port |     |   |   |       | Enable   | Destination IP:Port |     |   |   |       |
| IP TX1  | CAM 1: ARD Digital1 (TP071)      | <input type="radio"/> on <input type="radio"/> off | 232                 | 144 | 1 | 1 | 10000 | <input type="radio"/> on <input type="radio"/> off | 232                 | 144 | 2 | 1 | 10000 |
| IP TX2  | CAM 2: ARD Digital2 (TP085)      | <input type="radio"/> on <input type="radio"/> off | 232                 | 144 | 1 | 2 | 10000 | <input type="radio"/> on <input type="radio"/> off | 232                 | 144 | 2 | 2 | 10000 |
| IP TX3  | CAM 3: ARD Digital3 (TP101)      | <input type="radio"/> on <input type="radio"/> off | 232                 | 144 | 1 | 3 | 10000 | <input type="radio"/> on <input type="radio"/> off | 232                 | 144 | 2 | 3 | 10000 |
| IP TX4  | CAM 4: ARD HD1 (TP019)           | <input type="radio"/> on <input type="radio"/> off | 232                 | 144 | 1 | 4 | 10000 | <input type="radio"/> on <input type="radio"/> off | 232                 | 144 | 2 | 4 | 10000 |
| IP TX5  | DVBS RX1.1: ARD Digital1 (TP071) | <input type="radio"/> on <input type="radio"/> off | 232                 | 144 | 1 | 5 | 10000 | <input type="radio"/> on <input type="radio"/> off | 232                 | 144 | 2 | 5 | 10000 |
| IP TX6  | DVBS RX1.2: ARD Digital2 (TP085) | <input type="radio"/> on <input type="radio"/> off | 232                 | 144 | 1 | 6 | 10000 | <input type="radio"/> on <input type="radio"/> off | 232                 | 144 | 2 | 6 | 10000 |
| IP TX7  | DVBS RX1.3: ARD Digital3 (TP101) | <input type="radio"/> on <input type="radio"/> off | 232                 | 144 | 1 | 7 | 10000 | <input type="radio"/> on <input type="radio"/> off | 232                 | 144 | 2 | 7 | 10000 |
| IP TX8  | DVBS RX1.4: ARD HD1 (TP019)      | <input type="radio"/> on <input type="radio"/> off | 232                 | 144 | 1 | 8 | 10000 | <input type="radio"/> on <input type="radio"/> off | 232                 | 144 | 2 | 8 | 10000 |

Figure 32: Table 1 "IP TX settings (MPTS)"

Here you can select the desired program source for each channel in column „Source“ from a dropdown list. Each channel can be routed to one of the outputs A or B respectively to both channels by clicking the radiobutton „On“. Type in the IP port into the corresponding input fields.

Click on the „Submit“ button below the last table to store changes.  
Click on the „Reset Form“ button to restore the original settings.

To configure one of the 8 MPTS channels click on one of the items TX1“, „TX 2“, „TX 3“ ... „TX 8“ in the left column. You will then see the following table:

IP TX1 Channel Settings

| Property            | Data A (eth2) 1G                                   |     |   |     |       | Data B (eth3) 1G                                   |     |   |     |       |
|---------------------|--|-----|---|-----|-------|--|-----|---|-----|-------|
| Enable              | <input type="radio"/> on <input type="radio"/> off |     |   |     |       | <input type="radio"/> on <input type="radio"/> off |     |   |     |       |
| Transmit IP:Port    | 172  | 24  | 0 | 142 | 0     | 172  | 25  | 0 | 142 | 0     |
| Destination IP:Port | 232  | 144 | 1 | 1   | 10000 | 232  | 144 | 2 | 1   | 10000 |
| Destination MAC     | 01:00:5e:10:01:01                                  |     |   |     |       | 01:00:5e:10:02:01                                  |     |   |     |       |

Figure 33: Table 1 „IP TX1 Channel Settings“

You can activate or deactivate forwarding of the selected IP output to ports A and B respectively by clicking on the corresponding radio button. The MAC address is displayed for ports A and B respectively ("Destination MAC").

You can enter one value for ports A and B respectively for the following parameters:

- ☐ Transmit IP: Port: Enter the transmit IP address here.
- ☐ Destination IP: Port: Enter the transmit IP address of a reception device here.
- ☐ TOS/TTL: You can enter a value for the "Type of service" here (which is used for prioritising the IP data packets). Enter a value for the validity period here ("Time to Live").
- ☐ VLAN (Set 0 to disable): Enter the address of a virtual local network here.



Another table is shown in the following in which settings valid for data ports A and B can be entered.

| Property                             | Data A (eth2)  | Data B (eth3) |
|--------------------------------------|--|---------------|
| TOS / TTL                            | 184 1  | 184 1         |
| VLAN (Set 0 to disable)              | 0  | 0             |
| TS Packets per Frame                 | 7  |               |
| Protocol Encapsulation               | <input checked="" type="radio"/> RTP/UDP/IP <input type="radio"/> UDP/IP |               |
| FEC (L Cols / D Rows / Interleaving) | 10 10 Col+Row Plain  |               |
| Modify multiple Channels             |  |               |

Figure 34: Table 2 “IP TX1 channel settings”

- ☐ TS Packets per Frame: The number of transport stream packets per frame; select a value between 1 and 7 from the drop-down menu.
- ☐ Protocol Encapsulation: Select either “RTP/UDP/IP” or “UDP/IP” as the protocol by clicking the corresponding radio button.
- ☐ FEC: Forward error correction  
Select the number of columns from the first drop-down menu (“off” or a value between 1 and 20).  
Select the number of rows from the second drop-down menu (“off” or a value between 4 and 20).  
Select one of the two options, “Columns and rows” (Col + Rows) and “Column only” (Col only) from the third drop-down menu.  
Select one of the options “Plain”, or “Annex A” or “Annex B” respectively, from the fourth drop-down menu.

Click on the “Submit” button below the last table to save the changes.  
Click on “Reset form” to restore the original settings.

Submit

Reset Form

## Menü „TX 9.. (SPTS)“

The configuration of the SPTS channels is done - depending on the number of activated channels - via one or more menus „TX XX...YY“ with XX and YY > 8; e. g. „TX 9...24“. Click on the item „TX 9..24“ in the main menu on the left. You will now see the following table:

IP TX Channel Settings (SPTS) 9..24

| Channel | Source                                 | Data A   |                     |     |     |     |       | Data B   |        |                     |     |     |       | Action |
|---------|--|--|---------------------|-----|-----|-----|-------|--|--------|---------------------|-----|-----|-------|--------|
|         |  | Enable   | Destination IP:Port |     |     |     |       |  | Enable | Destination IP:Port |     |     |       |        |
| IP TX9  | 1-Das Erste (SD-TV, SID:28106)         | <input type="radio"/> on <input type="radio"/> off | 232                 | 144 | 1   | 9   | 10000 | <input type="radio"/> on <input type="radio"/> off | 232    | 144                 | 2   | 9   | 10000 |        |
| IP TX10 | 1.1-Das Erste (SD-TV, SID:28106)       | <input type="radio"/> on <input type="radio"/> off | 232                 | 144 | 1   | 10  | 10000 | <input type="radio"/> on <input type="radio"/> off | 232    | 144                 | 2   | 10  | 10000 |        |
| IP TX11 | selected service not found (SID:17316) | <input type="radio"/> on <input type="radio"/> off | 232                 | 21  | 100 | 138 | 1234  | <input type="radio"/> on <input type="radio"/> off | 232    | 22                  | 100 | 138 | 10000 |        |
| IP TX12 | selected service not found (SID:17312) | <input type="radio"/> on <input type="radio"/> off | 232                 | 21  | 100 | 139 | 1234  | <input type="radio"/> on <input type="radio"/> off | 232    | 22                  | 100 | 139 | 10000 |        |
| IP TX13 | selected service not found (SID:13501) | <input type="radio"/> on <input type="radio"/> off | 232                 | 21  | 100 | 140 | 1234  | <input type="radio"/> on <input type="radio"/> off | 232    | 22                  | 100 | 140 | 10000 |        |
| IP TX14 | selected service not found (SID:8204)  | <input type="radio"/> on <input type="radio"/> off | 232                 | 21  | 100 | 141 | 1234  | <input type="radio"/> on <input type="radio"/> off | 232    | 22                  | 100 | 141 | 10000 |        |
| IP TX15 | selected service not found (SID:8208)  | <input type="radio"/> on <input type="radio"/> off | 232                 | 21  | 100 | 142 | 1234  | <input type="radio"/> on <input type="radio"/> off | 232    | 22                  | 100 | 142 | 10000 |        |
| IP TX16 | selected service not found (SID:8211)  | <input type="radio"/> on <input type="radio"/> off | 232                 | 21  | 100 | 143 | 1234  | <input type="radio"/> on <input type="radio"/> off | 232    | 22                  | 100 | 143 | 10000 |        |
| IP TX17 | selected service not found (SID:1100)  | <input type="radio"/> on <input type="radio"/> off | 232                 | 21  | 100 | 144 | 1234  | <input type="radio"/> on <input type="radio"/> off | 232    | 22                  | 100 | 144 | 10000 |        |

Figure 35: Table 1 „IP TX Channel Settings (SPTS) 9..24“

In column „Source“ you can select the desired program source from a dropdown list. Each channel can be routed to one of the outputs A or B respectively to both channels by clicking the radiobutton „On“. Type in the IP port into the corresponding input fields.

If desired you can delete the channels from the list by clicking on the minus symbol in column „Action“.

Click on the „Submit“ button below the last table to save the changes.

Click on „Reset form“ to restore the original settings.

Submit

Reset Form

To configure an SPTS channel in detail click on one of the items TX9“, „TX 10“, „TX 11“ ... „TX 24“ in the left column. You will now see the following table:

| Property            | Data A (eth2) 1G                                   |     |   |     |       | Data B (eth3) 1G                                   |     |   |     |       |
|---------------------|--|-----|---|-----|-------|--|-----|---|-----|-------|
| Enable              | <input type="radio"/> on <input type="radio"/> off |     |   |     |       | <input type="radio"/> on <input type="radio"/> off |     |   |     |       |
| Transmit IP:Port    | 172  | 24  | 0 | 142 | 0     | 172  | 25  | 0 | 142 | 0     |
| Destination IP:Port | 232  | 144 | 1 | 1   | 10000 | 232  | 144 | 2 | 1   | 10000 |
| Destination MAC     | 01:00:5e:10:01:01                                  |     |   |     |       | 01:00:5e:10:02:01                                  |     |   |     |       |

Figure 36: Table 1 „IP TX Channel Settings“

Here you can activate or deactivate the routing of the selected IP output to ports A and B by clicking on the corresponding radiobutton. For ports A and B the MAC address is displayed („Destination MAC“).

For the following parameters you can type in a value for ports A and B:

- ☐ Transmit IP: Port: Type in the transmission IP address.
- ☐ Destination IP: Port: Type in the IP address of a reception unit.
- ☐ TOS / TTL: Here you can type in a value for the „Type of Service“ (for priority of IP data packages). / Type in a value for the desired period of validity („Time to Live“)
- ☐ VLAN (Set 0 to disable): Type in the address of a virtual local network.

**HINWEIS:** You can edit further SPTS channels via additional menus TX XX...YY in the main menu on the left.

## “User Settings” menu

Click on the menu item “User Settings” in the main menu at the left to have the corresponding input mask displayed. The following input mask now appears:

### User Administration

| Property                  | Username                            | New Password | Retype New Password | Delete                   |
|---------------------------|-------------------------------------|--------------|---------------------|--------------------------|
| Admin account             | admin                               |              |                     |                          |
| User account 1            | user                                |              |                     | <input type="checkbox"/> |
| User account 2            | controller                          |              |                     | <input type="checkbox"/> |
| User account 3            |                                     |              |                     | <input type="checkbox"/> |
| Timeout                   | 10 minutes                          |              |                     |                          |
| Name                      | ASTRO EdgeStreammer U168            |              |                     |                          |
| Location                  | Headend in Cablecity                |              |                     |                          |
| Contact                   | John Doe, admin@example.com         |              |                     |                          |
| Enforce password policy   | <input checked="" type="checkbox"/> |              |                     |                          |
| Disallow anonymous access | <input type="checkbox"/>            |              |                     |                          |

Figure 37: User administration

You can create up to four users for the user interface of the U 168. The following three users have been created as the default setting:

- ☐ admin
- ☐ user
- ☐ controller

Users logged in as administrator can change all of the settings in the user interface. A number of settings are not accessible for other user groups (e.g. “IP Interface Settings” table in the “Main” menu). The password for all three users is “astro”.

To change the access data for a user account, or to create a new one, enter the preferred user name in the input field `User name`. Then enter the preferred password in the input field `New Password`, and confirm it by typing it in the input field `Retype New password` again.

**HINWEIS:** A password must contain at least 5 characters. You can increase the minimum requirements for passwords using the “Enforced Password Policy” option (see below).

To delete a user account, activate the corresponding checkbox `Delete` for the respective account in the right column of the table.

The following settings can also be entered:

- ☐ **Timeout:** You can enter a time for the automatic logout, in minutes, in this input field. If no more inputs are made in the user interface, then automatic logout will occur once the time entered here has elapsed.  
The time remaining until automatic logout is displayed under the main menu, in the left column of the user interface.
- ☐ **Name, Location, Contact:** You can save a name for the system, the location and the contact data for a person in these input fields. They are displayed in the status line.
- ☐ **Enforced Password Policy:** Activate the checkbox when a password should have a minimum of 8 characters, and include at least one lower-case letter, one upper-case letter, one number and one special character.
- ☐ **Disallow anonymous access:** Activate the checkbox when access to the content area (tables) should only be possible after logging in.

**WICHTIG:** All changes will only be applied after you have clicked on the "Submit" button below the input mask. Click on the "Reset Form" button to delete the input values again.

Another table follows in which you can enter information for a RADIUS server. A licence is also required for the RADIUS server function.

#### RADIUS Administration

|                       |                          |
|-----------------------|--------------------------|
| RADIUS Server Address | 123.0.0.0                |
| RADIUS Server Port    | 1812                     |
| RADIUS Shared Secret  |                          |
| RADIUS Retries        | 3                        |
| RADIUS Timeout        | 2                        |
| Enable RADIUS login   | <input type="checkbox"/> |

Figure 38: RADIUS administration

The following items of information can be entered individually:

- ☐ RADIUS Server Address
- ☐ RADIUS Server Port
- ☐ RADIUS Shared Secret
- ☐ RADIUS Server Retries
- ☐ RADIUS Server Timeout
- ☐ Enable RADIUS Log-in

**HINWEIS:** Users who have been configured on the device will be deactivated when a RADIUS server is configured.

The RADIUS server must be configured accordingly. Users with the service type "Administrative" are the device administrators.

When you click the checkbox "Enable Radius login", the RADIUS function is activated if the RADIUS server is able to be reached. If this is not the case, the RADIUS function remains inactive, and the message "RADIUS logins have not been enabled because the connection check failed" appears.

You can create a white list for all incoming IP data in a further table. In this case, only IP data will be processed which come from a source entered in the white list.

|                | Address |   |   |   | Netmask |   |   |   |
|----------------|---------|---|---|---|---------|---|---|---|
| IP Whitelist 1 | 0       | 0 | 0 | 0 | 0       | 0 | 0 | 0 |
| IP Whitelist 2 | 0       | 0 | 0 | 0 | 0       | 0 | 0 | 0 |
| IP Whitelist 3 | 0       | 0 | 0 | 0 | 0       | 0 | 0 | 0 |
| IP Whitelist 4 | 0       | 0 | 0 | 0 | 0       | 0 | 0 | 0 |

Figure 39: White list administration

The following parameters can be specified for four IP sources respectively:

- ☐ IP address
- ☐ Netmask

“SSL Settings” menu

**HINWEIS:** A licence is required to use the SSL functions.

To enter SSL settings, click on the item “SSL Settings” in the main menu at the left.

There is a checkbox in the upper table “SSL Settings” which displays the rerouting of HTTP requests to the secure protocol HTTPS. After input of the licence, the checkbox is activated.

| Setting                         | Value                    |
|---------------------------------|--------------------------|
| Redirect HTTP requests to HTTPS | <input type="checkbox"/> |

Figure 40: “SSL settings” table

In the following table, “Generate a CSR for this device”, individual items of information about the device can be entered (“Certificate Signing Request”: address, organisation, etc.).

Generate a CSR for this device

| CSR Attribute                | Value                                       |
|------------------------------|---|
| Private key in use           | generated by device                         |
| Country (C)                  | DE  |
| State (ST)                   |   |
| Locality (L)                 |   |
| Organization (O)             |   |
| Organizational Unit (OU)     |   |
| Common Name (CN)             | 192.168.1.153                               |
| Generate CSR with above data | <input type="button" value="Download CSR"/> |

Figure 41: “Generate a CSR for this device” table

By clicking the “Download CSR” button, you can create a “Certificate Signing Request” with which your CA can issue a certificate for the device. The input field “Private key in use” shows you whether the device’s own key, or the key which was entered and saved, is being used.

There is a third table, “Key and certificate settings”, below this.

Key and certificate settings

|   |  |                         |   |
|---|--|-------------------------|---|
| Upload device key in PEM format   | <input type="button" value="Durchsuchen..."/>    | Keine Datei ausgewählt. | <input type="button" value="Upload key"/>         |
| Clear supplied key  | <input type="button" value="Clear key"/>         |                         |   |
| Upload device certificate in PEM format   | <input type="button" value="Durchsuchen..."/>    | Keine Datei ausgewählt. | <input type="button" value="Upload certificate"/> |
| Clear supplied certificate  | <input type="button" value="Clear certificate"/> |                         |   |
| Regenerate device key and certificate   | <input type="button" value="Regenerate"/>        |                         |   |
| <input type="button" value="Submit"/> <input type="button" value="Reset Form"/> |  |                         |   |

Figure 42: “Key and certificate settings” table

“

This table allows you to:

- ☐ Upload a device key (click on the "Search" button and select the preferred file; then click on the "Upload key" button)
- ☐ Delete an existing device key (click the "Clear key" button)
- ☐ Upload a device certificate (click on the "Search" button and select the preferred file; then click on the "Upload certificate" button)
- ☐ Delete an existing device certificate (click the "Clear certificate" button)
- ☐ Regenerate a device key and device certificate (click the "Regenerate" button)

The device administers two keys/pairs of certificates: "generated" and "user". The following figure shows which certificate and which key are used.

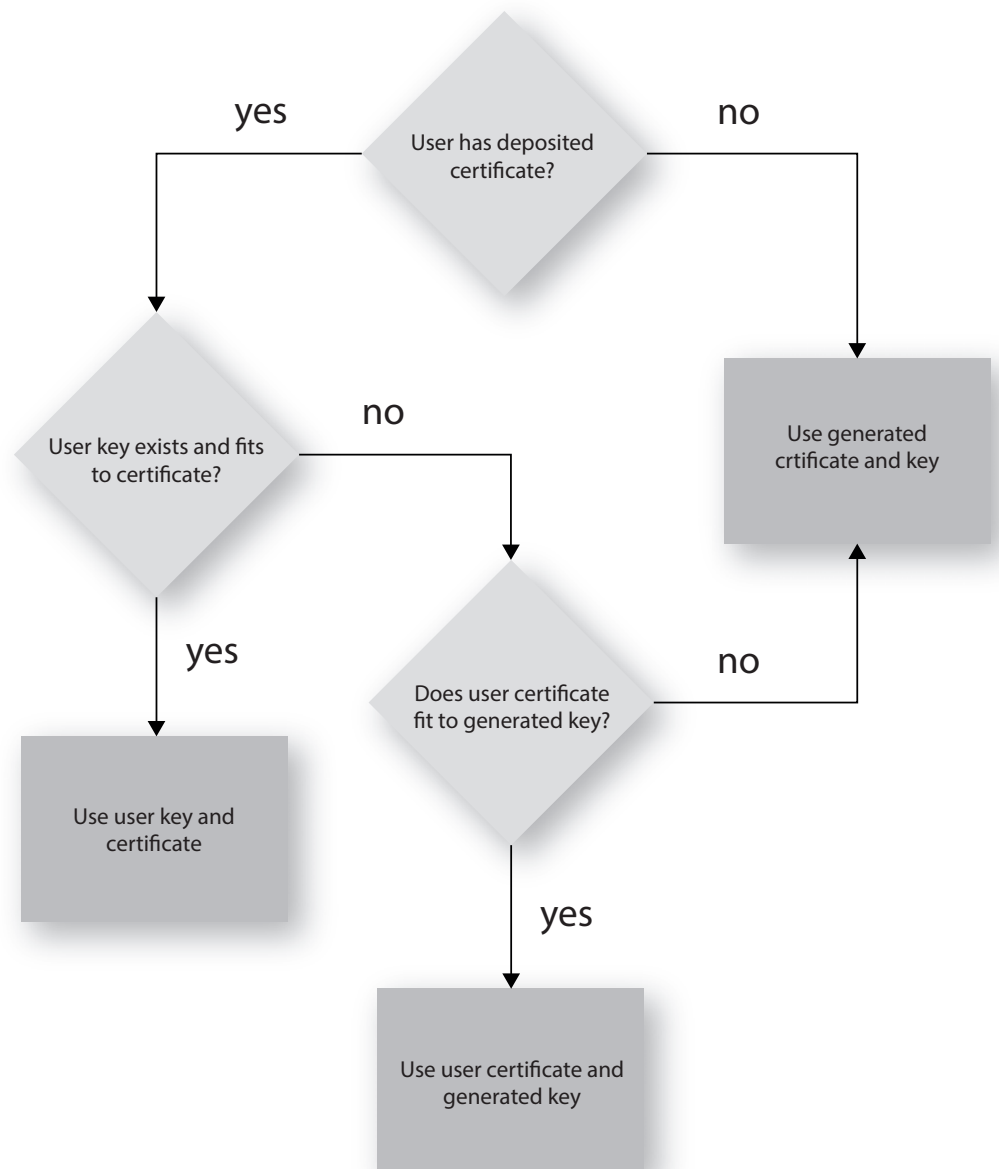


Figure 43: Using the certificates/keys

## “TS Analyzer” menu

The device can be equipped with a Transport Stream Analyzer by purchasing a licence. This Analyzer displays the structure of the MPEG2 TS, from the tables to the individual PID and its service. Click on the “TS Analyzer” submenu to access and select the transport stream for analysis. The following input mask now appears:

TS Analyzer

| Alias   | ORF1<br>ORF                      |                       |                       |                       | ORF1<br>ORF           | ORF1<br>ORF           | ASTR<br>O<br>ASTR<br>O | ASTR<br>O<br>ASTR<br>O | ASTRO                 |
|---------|----------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|------------------------|-----------------------|
| TSID    | 1117                             | 0                     | 0                     | 0                     | 1117                  | 1117                  | 65535                  | 65535                  | 65535                 |
| ONID    | 1                                | 0                     | 0                     | 0                     | 1                     | 1                     | 65535                  | 65535                  | 65535                 |
| Source  | IP<br>RX1                        | IP<br>RX2             | IP<br>RX3             | IP<br>RX4             | CAM<br>1              | CAM<br>2              | CAM<br>3               | CAM<br>4               | Test<br>Gen.          |
| Analyze | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/> |

Standard

Table

|      |   |   |   |   |
|------|---|---|---|---|
| MPEG | <input checked="" type="checkbox"/> PAT               | <input checked="" type="checkbox"/> CAT               | <input type="checkbox"/> TSDT                   | <input checked="" type="checkbox"/> PMTs              |
| DVB  | <input checked="" type="checkbox"/> NIT actual        | <input type="checkbox"/> NIT other (only first found) | <input checked="" type="checkbox"/> SDT actual  | <input type="checkbox"/> SDT other (only first found) |
|      | <input type="checkbox"/> EIT actual present/following | <input type="checkbox"/> EIT actual schedule          | <input type="checkbox"/> BAT (only first found) | <input type="checkbox"/> RST (only first found)       |
|      | <input checked="" type="checkbox"/> TDT               | <input type="checkbox"/> TOT                          |   |   |

Please be patient until measurements are finished. (e.g. EIT may take a long time.)

No License

ASTRO Strobel Kommunikationssysteme GmbH

Figure 44: Transport stream analyzer

To analyse a transport stream, click on the corresponding radio button in the “Analyze” line and then click on the “Submit” button. If you wish to reset your inputs, click on the “Reset” button.

**HINWEIS:** The two buttons “Submit” and “Reset” are only visible when this module has been licensed. If this is not the case, the link “No licence” will appear instead. Click on this, or the item “Licence” in the menu at the left, to access the “Licensing” input mask (more detailed explanation of this is found in the section “Licensing”).

SubmitReset Form

## "Licensing" menu

A number of functions of the device (e.g. the TS Analyzer) can only be used after being enabled by means of a licence key.

The licence key with the respective function can be purchased from ASTRO. You will receive a licence key with which you can activate the functions using the web browser interface.

The format of the licence key is a text document (e.g. Lic001772000222.txt).

To activate the functions, start by clicking on the "Licensing" item in the menu at the left. The following input mask now appears:

### Licensing

This device has the HWID 00:17:72:02:00:d0 and you have already licensed:

4 IP TX

4 IP RX

The software included in this product contains copyrighted software that is licensed under the GPLv3. A copy of that license is included in this device on page [gpl.txt](#) from us for a period of three years after our last shipment of this product and/or spare parts therefor, which will be no earlier than 2015-08-01, via email to [kontakt@astro-strobel.de](#)

ASTRO Strobel Kommunikationssysteme GmbH

Figure 45: Enabling licences using the licence key

Now enter the licence key sent to you in the input field. The key or keys can be entered in the input mask using "Copy & Paste". Then click on the "Submit" button to transmit the text to the device. If the licence is valid, this is confirmed with the message "License is valid". An error message is displayed for an invalid licence.

To order additional licences, the MAC address of the device must be specified.

You will find the MAC address on the web browser interface in the "Licensing" submenu (HWID). After the MAC address has been submitted, the licence keys are generated by ASTRO are sent by e-mail or on a CD.



## “Update/config.” menu

The menu item “Update/config.” allows you to update the firmware version of your device and upload and download a variety of configuration data.

### Firmware update from a local memory location

You will require an update archive for updating the device firmware. This can be downloaded from the ASTRO firmware server (address: “http://astro-firmware.de/Headend-Firmware/u1xx”). The file name of the archive required ends in “.up”. The name is comprised of the type designation of the device and a four-digit version number.

Once the update archive has been downloaded, start by selecting the item “Update/Config.” in the user interface menu. The “Software update” table then appears in the content area at the top.

#### Software Update

| Property         | Value  |
|------------------|--|
| File             | <div>Durchsuchen... Keine Datei ausgewählt Update and reboot</div> |
| Software archive | u168xxxx.up  |

Figure 46: Firmware update

Now click on the “Search” button and select the path to the memory location of the update archive downloaded beforehand.  
Then click on the “Update and Reboot” button to start the update process. Please wait for the process to be completed, and for the device to reboot.

### Available Update Archives

The table „Available Update Archives“ shows an overview update-archives already stored in the module (up to ten). Users can have access to older software versions (Installation or deleting).

#### Available Update Archives

| Filename    | Size     | Version | Install            | Delete            |
|-------------|----------|---------|--------------------|-------------------|
| U1165294.UP | 7.64 MiB | 5294    | <div>install</div> | <div>delete</div> |
| U1165325.UP | 7.86 MiB | 5325    | <div>install</div> | <div>delete</div> |
| U1165341.UP | 7.92 MiB | 5341    | <div>install</div> | <div>delete</div> |

Bild 47: Firmware Update

### Uploading and downloading configuration files

#### Config files (download/upload)

| Property        | Value   |
|-----------------|---|
| File            | <div>Durchsuchen... Keine Datei ausgewählt Upload</div> |
| System settings | <a href="#">settings.xml</a>                            |

Figure 48: Loading/saving configuration files

Configuration files can be uploaded and downloaded.  
To upload files, use the “Search” button to select the preferred file.  
Then click on the “Upload” button to start the uploading process.  
The following files are available for download:

- ☐ System settings (XML format)

Simply click on the corresponding file link to download the file.

## Downloading configuration/status files

### Config/status files (read only)

| Property            | Value                       |
|---------------------|-----------------------------|
| Module info         | <a href="#">module.xml</a>  |
| IP configuration    | <a href="#">ip.xml</a>      |
| System status       | <a href="#">status.xml</a>  |
| System measurements | <a href="#">measure.xml</a> |

Figure 49: Loading status files

The following files are available for download:

- ☐ Module info (XML format)
- ☐ IP configuration (XML format)
- ☐ System status (XML format)
- ☐ System measurements (XML format)

Simply click on the corresponding file link to download the file.

## Loading/saving firmware and configurations using (T)FTP

You can update firmware using a (T)FTP server using the table "Firmware update and configuration via server" and load or save configuration files.

### Firmware update and configuration via server

| Property                      | Value   |
|-------------------------------|---|
| (T)FTP Server address         | <input type="text" value="astro-firmware.de"/>                  |
| Protocol                      | <input checked="" type="radio"/> FTP <input type="radio"/> TFTP |
| FTP Username (e.g. anonymous) | <input type="text" value="anonymous"/>                          |
| FTP Password (e.g. guest)     | <input type="password" value="....."/>                          |
| Path                          | <input type="text" value="/Headend-Firmware/u1xx/"/>            |
| Version                       | <input type="text"/>  |
| Mode                          | <input type="text" value="Please select"/>                      |

Figure 50: Loading/saving firmware updates and configurations using (T)FTP

To carry out the preferred action, start by selecting an action from the drop-down menu in the "Mode" line. The action can only be carried out when the server path specified does actually exist. Furthermore, any firewalls that have been installed must be configured in a way that allows (T)FTP communication.

The following actions can be selected individually:

- ☐ **"Load config from server"** action: A configuration stored on the (T)FTP server is transmitted to the device and can be activated immediately. The IP settings for the data and management interfaces on the device are not changed. The file "settings.xml" are written onto the device.
- ☐ **"Save config to server"** action: The current configuration of the device is written to the (T)FTP server. The configuration includes the following files:
  - "ip.xml" (IP settings for the data and management interfaces)
  - "settings.xml" (all other settings, e.g. IP receiver and modulator settings)
  - "user.xml" (user data)
- ☐ **"Update firmware from server"** action: If you select this action, you must specify the preferred software version under *Version* (a 4-character maximum applies). Once the update is successful, the message "Firmware update OK. Please reboot to use the new firmware version" appears.
- ☐ **"Load firmware from server"** action: If you select this action, you must specify the preferred software version under *Version* (a 4-character maximum applies). The software selected is written to the SD memory card, but will not be unpacked.
- ☐ **"Unpack \*.up archive"** action: If you select this action, the update archive is unpacked and saved to the SD memory card (specify the version number).
- ☐ **"Update firmware from SD card"** action: If you select this action, the specified update archive on the SD memory card is unpacked and programmed into the module (enter the version number).
- ☐ **"Overwrite backup firmware"** action: The device software is saved in two partitions. The software saved in the first partition is used for operating the module, while the second partition is used to keep a backup copy ready for the event that the update process fails. As long as both partitions are different, the information "Backup differs" will be displayed in the menu "Active Alarm Table". The current software is copied to the backup partition when this action is carried out.

Once you have selected an action, you can add any information still missing from the remaining lines of the table:

- ☐ (T)FTP Server address: Address of the server
- ☐ Protocol: Activate the radio button "FTP" if you wish to use the more comprehensive FTP protocol. Activate the radio button "TFTP" if you wish to use the more basic TFTP protocol.
- ☐ FTP User name: This depends on the settings for the FTP server used (for astro-firmware.de e.g. "anonymous").
- ☐ FTP Password: This depends on the settings for the FTP server used (for astro-firmware.de e.g. "astro").
- ☐ Path: Path to the location where data are saved, or from where the data can be loaded. The path must be specified in relation to the root directory of the FTP server, and must always begin with a "/" and end with a "/" as well (enter without quotation marks).
- ☐ Version: Enter the version number of the software which you wish to download or save here.

**HINWEIS:** If the update is carried out using the TFTP protocol, then filling in the input fields "FTP User name" and "FTP Password" is not necessary.

## “System Log” menu

To have the system log displayed, click on “System log” in the menu at the left. The following overview will now appear:

**System Log Settings**

**Local logfile**

Log file filter: ☒ Emergency ☒ Alert ☒ Critical ☒ Error ☒ Warning ☒ Notice ☒ Info ☒ Debug

Debug log file: ☐ on ☐ off

Delete log files after: 90 days

**Syslog**

Syslog server: 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0

Syslog filter: ☒ Emergency ☒ Alert ☒ Critical ☒ Error ☒ Warning ☒ Notice ☒ Info ☒ Debug

**SNMP traps**

SNMP trap receiver: 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0

SNMP trap community: public

SNMP trap filter: ☒ Emergency ☒ Alert ☒ Critical ☒ Error ☒ Warning ☒ Notice ☒ Info ☒ Debug

**SNMP agent**

SNMP access: ☐ on ☐ off

SNMP GET/SET community: public

Access permission: ☒ Read ☐ Write ☐ Read ☐ Write ☐ Read ☐ Write ☐ Read ☐ Write ☐ Read ☐ Write ☐ Read ☐ Write

SNMP authentication failure trap: ☐ on ☐ off

Enforce community policy: ☒

Note: Use empty fields for unused SNMP addresses or communities  
Note: To enforce community policy login as admin.

Submit Reset Form

**System Log**

Refresh Check box to clear log on refresh

System log in CSV format: log.csv  
Debug log in CSV format: debug.csv  
Use right click and "save as" to save locally.

| Number | Time                     | Uptime         | User   | Source  | Severity | Message         |
|--------|--------------------------|----------------|--------|---------|----------|-----------------|
| 1      | 09 Jul 2014 11:20:09 UTC | 0d 00h 02m 00s | system | 0.0.0.0 | notice   | Fan good (6000) |

Figure 51: System log

You can check or configure the following parameters individually:

### System log settings

**System Log Settings**

**Local logfile**

Log file filter: ☒ Emergency ☒ Alert ☒ Critical ☒ Error ☒ Warning ☒ Notice ☒ Info ☒ Debug

Debug log file: ☐ on ☐ off

Delete log files after: 90 days

**Syslog**

Syslog server: 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0

Syslog filter: ☒ Emergency ☒ Alert ☒ Critical ☒ Error ☒ Warning ☒ Notice ☒ Info ☒ Debug

**SNMP traps**

SNMP trap receiver: 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0

SNMP trap community: public

SNMP trap filter: ☒ Emergency ☒ Alert ☒ Critical ☒ Error ☒ Warning ☒ Notice ☒ Info ☒ Debug

**SNMP agent**

SNMP access: ☐ on ☐ off

SNMP GET/SET community: public

Access permission: ☒ Read ☐ Write ☐ Read ☐ Write ☐ Read ☐ Write ☐ Read ☐ Write ☐ Read ☐ Write ☐ Read ☐ Write

SNMP authentication failure trap: ☐ on ☐ off

Enforce community policy: ☒

Note: Use empty fields for unused SNMP addresses or communities  
Note: To enforce community policy login as admin.

Submit Reset Form

Figure 52: Filter settings for the system log display

You can activate or deactivate filters for displaying the log entries here. To have messages from the corresponding category displayed, activate the checkbox allocated to the category.

**HINWEIS:** You can connect to higher-level management systems using the “Syslog” and “SNMP” parameters.

## Management Information Base (MIB)

The SNMP MIBs available are stored on the device and can be downloaded by using the download link below the table "System Log Settings".

## System log

### System Log

☐ Check box to clear log on refresh

System log in CSV format: [log.csv](#)  
 Debug log in CSV format: [debug.csv](#)  
 Use right click and "save as" to save locally.

| number | time                     | uptime         | user   | source       | severity | message                  |
|--------|--------------------------|----------------|--------|--------------|----------|--------------------------|
| 1      | 01 Jan 1970 00:14:05 UTC | 0d 00h 14m 05s | user   | 192.168.1.26 | info     | Login                    |
| 2      | 01 Jan 1970 00:14:00 UTC | 0d 00h 14m 00s | admin  | 192.168.1.26 | info     | Logout                   |
| 3      | 01 Jan 1970 00:12:41 UTC | 0d 00h 12m 41s | admin  | 192.168.1.26 | info     | Login                    |
| 4      | 01 Jan 1970 00:10:19 UTC | 0d 00h 10m 19s | system | local        | info     | Login timeout            |
| 5      | 01 Jan 1970 00:01:41 UTC | 0d 00h 01m 41s | admin  | 192.168.1.26 | info     | Login                    |
| 6      | 01 Jan 1970 00:01:31 UTC | 0d 00h 01m 31s | system | local        | warning  | Time is not synced       |
| 7      | 01 Jan 1970 00:00:32 UTC | 0d 00h 00m 32s | system | local        | critical | Fan fail (0)             |
| 8      | 01 Jan 1970 00:00:26 UTC | 0d 00h 00m 26s | boot   | local        | info     | Ready                    |
| 9      | 01 Jan 1970 00:00:26 UTC | 0d 00h 00m 26s | system | local        | warning  | Backup firmware differs! |

Figure 53: Logfiles

Click on the "Refresh" button to update the system log display. The entries in the system log are sorted chronologically according to the time at which the event occurred.

If you do not wish for the existing entries to be displayed after a refresh, activate the checkbox "Check-box to clear log on refresh". Once the checkbox has been activated, after a refresh, the process of deleting the old log entries is listed as the first entry (specified the user account and the current time upon deletion).

You can also download the following logfiles:

- ☐ System log (CSV format)
- ☐ Debug log (CSV format)

**HINWEIS:** You can also download a complete archive of log files plus the complete device configuration by clicking on the link „To retrieve an archive of SUPPORT FILES click here:“. You will need the device configuration in case of support inquiries. The name of the file is put together by the name of the device and the last four numbers of the MAC address (e. g. U1xx\_0218f1\_support-files.tar).

Downloading log files

### Download Log Files

| Logfile                     | Last modified at    | Size     |
|-----------------------------|---------------------|----------|
| <a href="#">/0216da.csv</a> | 09.07.2014 11:20:12 | 2.20 kiB |

Figure 54: Downloading log files

A maximum of 2,500 lines is displayed in the "Log files" table. The complete log file can be downloaded from the "Download Log Files" table by clicking on the file name XX.csv.

## "Alarm severities" menu

You can change the alarm settings for diverse parameters or deactivate the alarm display for a parameter, when preferred. To do so, click on the item "Alarm Severities" in the menu at the left. A set of tables for different parameter groups then appears:

### Status of power supply, temperature, fan

| Code      | Message              | emergency             | alert                 | critical                         | error                 | warning               | notice                           | info                  | debug                 | off                   |
|-----------|----------------------|-----------------------|-----------------------|----------------------------------|-----------------------|-----------------------|----------------------------------|-----------------------|-----------------------|-----------------------|
| 0x1000002 | Temp 1 fail (%.1f)   | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 0x1000002 | Temp 1 good (%.1f)   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 0x1000003 | Temp 2 fail (%.1f)   | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 0x1000003 | Temp 2 good (%.1f)   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 0x1000004 | Temp 3 fail (%.1f)   | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 0x1000004 | Temp 3 good (%.1f)   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 0x1000005 | Temp 4 fail (%.1f)   | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 0x1000005 | Temp 4 good (%.1f)   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 0x1000006 | Fan fail (0)         | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 0x1000006 | Fan good (%.0f)      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 0x1000007 | Supp 1.2 fail (%.2f) | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 0x1000007 | Supp 1.2 good (%.2f) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 0x1000008 | Supp 1.5 fail (%.2f) | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 0x1000008 | Supp 1.5 good (%.2f) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 0x1000009 | Supp 1.8 fail (%.2f) | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 0x1000009 | Supp 1.8 good (%.2f) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 0x100000a | Supp 2.5 fail (%.2f) | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 0x100000a | Supp 2.5 good (%.2f) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 0x100000b | Supp 3.3 fail (%.2f) | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 0x100000b | Supp 3.3 good (%.2f) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 0x1000010 | Supp 5.2 fail (%.2f) | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Figure 55: Alarm Severities

The preset options for the alarm messages are identified by a green frame. Retaining these settings is recommended.

## “Active alarms” menu

To have the “Active Alarm” table displayed, click on the corresponding item in the menu at the left. The following table now appears:

Active Alarm Table

| number | time | uptime | user | source | severity | message | TSID | SID | alias |
|--------|------|--------|------|--------|----------|---------|------|-----|-------|
|--------|------|--------|------|--------|----------|---------|------|-----|-------|

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Figure 56: Active alarm table

The table provides information about error messages currently active. The “Message” column shows the error message in plain text.

***HINWEIS:** You can also access the “Active Alarm Table” by clicking the red point in the status line in the upper section of the user interface.*

## "Statistics" menu

To retrieve data transmission statistics for the U 168, click on the "Statistics" item in the menu at the left. All statistics relevant to the operation of the device and which can be used for analysis are displayed here. The following tables are displayed individually:

### Ethernet bandwidth

Ethernet bandwidth

| Property | Management A (eth0) 1G full | Management B (eth1) 1G full | Data A (eth2) 1G full | Data B (eth3) 1G full |
|----------|-----------------------------|-----------------------------|-----------------------|-----------------------|
| Transmit | 0.0 Mbit/s                  | 0.0 Mbit/s                  | 57.5 Mbit/s           | 0.0 Mbit/s            |
| Receive  | 0.0 Mbit/s                  | 0.0 Mbit/s                  | 0.0 Mbit/s            | 0.0 Mbit/s            |

Figure 57: Ethernet bandwidth

The transmission rates for sending (transmit) and reception (receive) are specified for the respective interfaces Management A, Management B, Data A and Data B.

### Ethernet frames

| Property  | Data A (eth2) 1G | Data B (eth3) 1G |
|---|------------------|------------------|
| Total frames sent by host                               | 2                | 0                |
| Total frames sent to host                               | 3                | 54               |
| Total exception frames sent to host                     | 19               | 2                |
| Total errored frames received                           | 0                | 0                |
| Total frames discarded by deencapsulator                | 0                | 0                |
| Total frames discarded because of lack of buffers       | 0                | 0                |
| Total transmit frames generated from IP TX 1 / per sec. | 107441 / 1260    | 0 / 0            |
| Total transmit frames generated from IP TX 2 / per sec. | 120496 / 1417    | 0 / 0            |
| Total transmit frames generated from IP TX 3 / per sec. | 106750 / 1260    | 0 / 0            |
| Total transmit frames generated from IP TX 4 / per sec. | 106461 / 1260    | 0 / 0            |

Figure 58: Ethernet frames

The following parameters are displayed for the interfaces Data A and Data B, in this order:

- ☐ The number of IP frames transmitted to the processor is specified in the first three lines of the table.
- ☐ Number of defective frames.
- ☐ Number of frames which could not be allocated.
- ☐ Number of frames which could not be allocated due to exceeding the total buffer depth.
- ☐ The number of frames transmitted per transport stream in total or per second is displayed in the following lines for each IP transmitter.



## Ethernet TX

| Property                   | Value |
|----------------------------|-------|
| Minimum FEC Freelist       | 220   |
| Maximum output queue depth | 255   |

*Figure 59: Ethernet TX*

In reference to forward error correction, the smallest number of free FEC buffers measured at all is displayed in the first line.  
The total number of FEC buffers is displayed in the second line.

## “Network” menu

To have the network settings displayed, click on “Network” in the menu at the left. The following overview will now appear:

Interface statistics

| Interface | Statistics  |
|-----------|---|
| eth3      | IPv4: 172.25.0.150, Broadcast: 172.25.255.255, Netmask: 255.255.0.0<br>UP BROADCAST RUNNING MULTICAST MTU: 1500, Metric: 0<br>Rx - Packets: 0, Bytes: 0, Tx - Packets: 0, Bytes: 0                    |
| eth2      | IPv4: 172.24.0.150, Broadcast: 172.24.255.255, Netmask: 255.255.0.0<br>UP BROADCAST RUNNING MULTICAST MTU: 1500, Metric: 0<br>Rx - Packets: 0, Bytes: 0, Tx - Packets: 0, Bytes: 0                    |
| eth1      | IPv4: 192.168.5.150, Broadcast: 192.168.5.255, Netmask: 255.255.255.0<br>UP BROADCAST RUNNING MULTICAST MTU: 1500, Metric: 0<br>Rx - Packets: 30, Bytes: 2340, Tx - Packets: 0, Bytes: 0              |
| eth0      | IPv4: 192.168.1.150, Broadcast: 192.168.1.255, Netmask: 255.255.255.0<br>UP BROADCAST RUNNING MULTICAST MTU: 1500, Metric: 0<br>Rx - Packets: 3414, Bytes: 314564, Tx - Packets: 3674, Bytes: 3042143 |
| lo0       | IPv4: 127.0.0.1, Broadcast: 127.0.0.1, Netmask: 255.0.0.0<br>UP LOOPBACK RUNNING MULTICAST MTU: 16384, Metric: 0<br>Rx - Packets: 387, Bytes: 32207, Tx - Packets: 387, Bytes: 32207                  |

Routing tables

| Destination | Gateway       | Mask      | Flags | Interface | Genmask |
|-------------|---------------|-----------|-------|-----------|---------|
| 0.0.0.0     | 192.168.1.100 | 0.0.0.0   | UG    | eth0      |         |
| 127.0.0.0   | 127.0.0.1     | 255.0.0.0 | UG    | lo0       |         |

Figure 60: Network settings

The detailed interface statistic properties which are displayed are for information purposes only, and are used to describe the network. They could be useful for customer service in the event of a fault.

## „Documentation” menu

To have a list of operating manuals, XML-Files and license texts displayed, click on „Documentation” in the menu at the left. The following overview will now appear:

### Manuals

| Description    | Link                         |
|----------------|------------------------------|
| English manual | <a href="#">u125mane.pdf</a> |
| German manual  | <a href="#">u125mang.pdf</a> |

### Annotated XMLs

| Description            | Link                             |
|------------------------|----------------------------------|
| Annotated settings.xml | <a href="#">settings-doc.xml</a> |
| Annotated status.xml   | <a href="#">status-doc.xml</a>   |

### License texts

The software included in this product consists of a number of separate binaries. Each of it has it's own software license as a result of the components it consists of. Each binary can be found and clicked here to view it's license and the licenses of the components it consists of:

- > [FM](#)
- > [Management](#)

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Figure 61: Menu „Documentation“

To open a file, just click on the desired item.

## Troubleshooting

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

- ☐ Check whether the device is connected to the required grid voltage (230 V~, 50 Hz for the U 100 base unit, and 48 V for the U 100-48 base unit).
- ☐ 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

The device must not be opened other than for repair purposes. Repairs may only be carried out at the factory or at workshops, or by persons, authorised by ASTRO Strobel GmbH.

Read carefully: EN 60728-11 Safety requirements: No service work during thunderstorms.

**HINWEIS:** *In the event of repairs, DIN VDE regulations 0701 - 0702, where applicable, must be adhered to, and these are secondary to the relevant data specifications in DIN EN 60950-1. You must disconnect the power plug before opening the base unit!*

## Service tasks

The following tasks, which involve the removal of screw connections, can be performed by appropriately instructed service personnel: Removal and installation of signal converters (e.g. U 116) and power modules, even when the U 100 is operating.

### Replacing converter modules

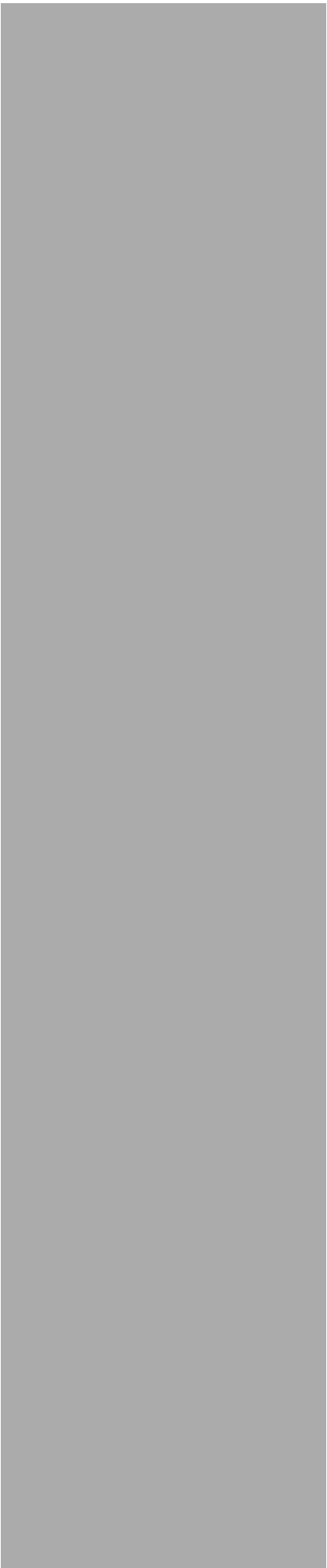
Converter modules can be pulled out to the front after removing the safety screw in the front covers (see section "Connecting and installing the module")

## Technical data

| Type   |         | U 168  | U 168-X  |
|--|---------|--|--|
| Order number   |         | 380 168  | 380 172  |
| EAN-Code   |         | 4026187170776  | 4026187194505  |
| Number of DVB-CT2 input signals  |         | 4  |  |
| Number of DVB-CT2 tuners   |         | 8  |  |
| Number of IP output streams  |         | 8 MPTS, 504 SPTS   |  |
| Interfaces   |         |  |  |
| Management   |         | 2 x 100 Base-T Ethernet (RJ 45)  |  |
| Data   |         | 2 x 1000 Base-T Ethernet (RJ 45)   |  |
| Protocols  |         | IEEE802.3 Ethernet, RTP, ARP, IPv4, TCP/UDP, HTTP, SNMP, IGMPv3                    |  |
| Transportstream Encapsulation  |         |  |  |
| Protocols  |         | UDP, UDP / RTP, 1-7 packets, FEC   |  |
| Packet length  | [Bytes] | 188 / 204  |  |
| DVB-C demodulator  |         |  |  |
| Frequency range  | [MHz]   | 47 - 862   |  |
| Input data rate  | [Mbaud] | 0,5 - 7  |  |
| Modulation modes (accord. DVB-standard)  |         | QPSK, QAM16, QAM32, QAM64, QAM128, QAM256  |  |
| Input symbol rate  | [MS/s]  | 1,8 - 7,2  |  |
| DVB-T demodulator / DVB-T2 demodulator (Scrambling of L1 post signalling; conforms to ETSI EN 302-755 v1.31) |         |  |  |
| Frequency range  | [MHz]   | 47 - 862   |  |
| Modulation   |         | DVB-T: 4-, 16-, 64-QAM; DVB-T2: 4-, 16-, 64-, 256-QAM                              | DVB-T: 4-, 16-, 64-QAM; DVB-T2: 4-, 16-, 64-, 256-QAM<br>DVB-T2 scrambling of L1 post signalling |
| Guardinterval  |         | DVB-T: 1/4; 1/8; 1/16; 1/32; DVB-T2: 1/4; 5/32; 1/8; 5/64; 1/16; 1/32; 1/64; 1/128 |  |
| FEC  |         | DVB-T: 1/2; 2/3; 3/4; 5/6; 7/8; DVB-T2: 1/2; 3/5; 2/3; 3/4; 4/5; 5/6               |  |
| FFT-Mode   |         | DVB-T: 2k, 8k; DVB-T2: 1k, 2k, 4k, 8k, 16k, 32k                                    |  |
| Bandwidth  | [MHz]   | DVB-T: 6; 7; 8; DVB-T2: 5; 6; 7; 8   |  |
| Input symbol rate  | [MS/s]  | DVB-T: 6, 7, 8; DVB-T2: 5, 6, 7, 8   |  |
| RF inputs  |         |  |  |
| Connectors   | [Ω]     | 75, 2 x F-jack   |  |
| Common data  |         |  |  |
| Current consumption at 48 V  | [mA]    | 710  |  |
| Power consumption at 36 - 60 V   | [W]     | 34 per module  |  |
| Input voltage  | [V]     | 36 - 60  |  |
| Dimensions   |         | 1 HU, 19 inch  |  |
| Ambient temperature  | [°C]    | 0 ... +45  |  |









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These operating instructions have been written by:

ASTRO Strobel Kommunikationssysteme GmbH

Olefant 1-3, D-51427 Bergisch Gladbach (Bensberg)

Tel.: 02204/405-0, Fax: 02204/405-10

eMail: [kontakt@astro.kom.de](mailto:kontakt@astro.kom.de)

Internet: [www.astro-kom.de](http://www.astro-kom.de)

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