U 194

IP / IP Descrambler

Operating manual

Version 04-2014A

Content

General information

NOTE: This operating manual was created to provide the most important instructions for operating the U 194 module. We expressly recommend reading this manual before installing or operating the devices.
The ASTRO company confirms the information in this manual to be 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 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.

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:

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

Important!

Before using the device, read the operating manual carefully and store it for future reference.

ATTENTION: This device is Class A equipment. It may cause radio interference in living areas. In this case, the operator may be obliged to take appropriate precautions!

General safety

ATTENTION: ***Disconnect both power plugs before opening the device!***

To avoid danger as far as possible, you must adhere the safety instructions in the operating instructions of the U 100-230 / U 100-48 base unit.

Assembly instructions

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

The U 194 module can only be mounted in ASTRO base units U 100-230 and U 100-48.

You must adhere the assembly instructions in the operating manual of the U 100-230 / U 100-48 base unit.

Warranty conditions

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

Disposal

All of our packaging material (cardboard boxes, inserts, plastic film and bags) is completely recyclable. Electronic devices must not be disposed of with household waste, but rather – according to DIRECTIVE 2002/96/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL from January 27, 2003, on waste electrical and electronic equipment – must be properly disposed of. When it is no longer in use, please bring the device for disposal to one of the public collection points for this purpose.

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

Description of performance

The U 194 can receive up to four video data streams and channels encapsulated in accordance with Internet Protocol (IP). The encrypted services these contain can be decrypted when the device has been fitted with four CI modules and been individually configured. The two Ethernet data ports in the U 194 can then be used to output four IP video data streams.

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

The U 194 plug-in module features the following performance characteristics:

- Multi-service descrambling
- 4 transport streams
- Decryption level: service-based, PID-based
- 4 CI slots; self-contained and cascading
- Easy configuration using web browser interface

Device description

The delivery consists of the following parts:

- ☐ U 194 IP/IP descrambler including a display module and backplane
- ☐ Operating manual

The U 194 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.

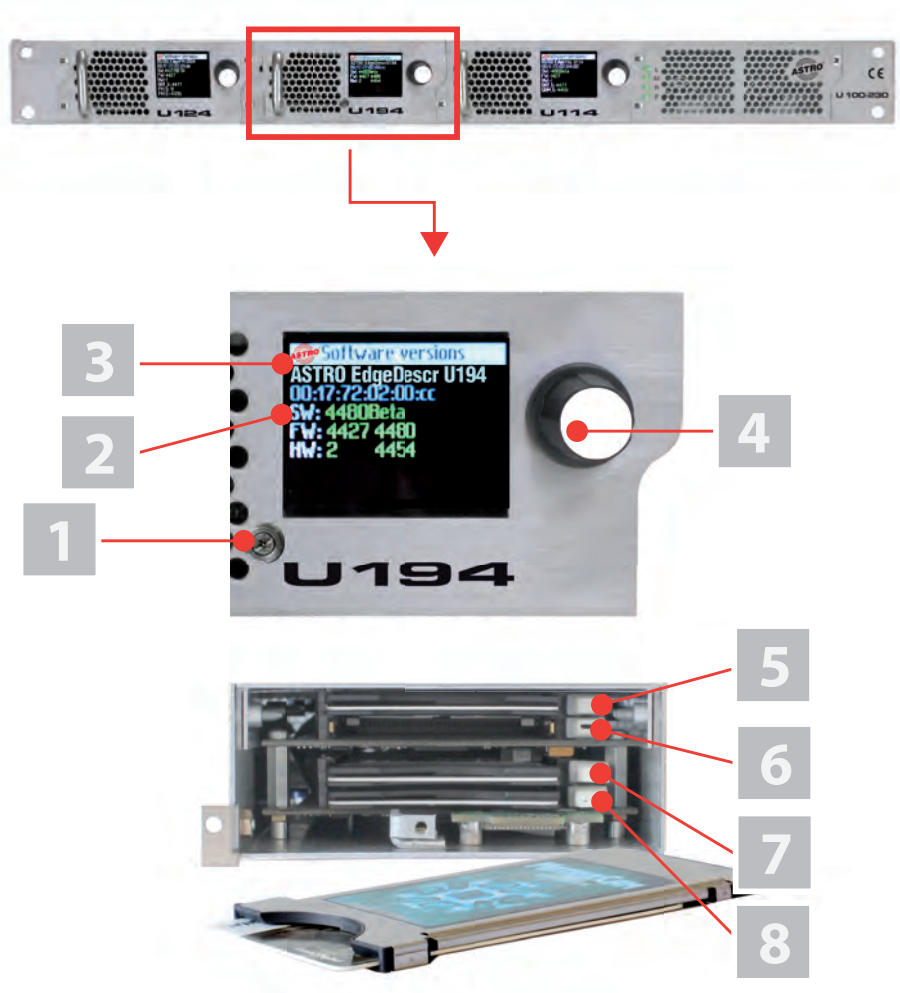
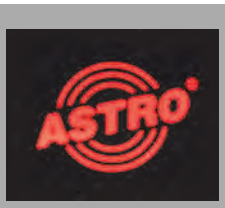


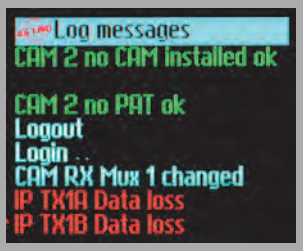
Figure 1: U 194

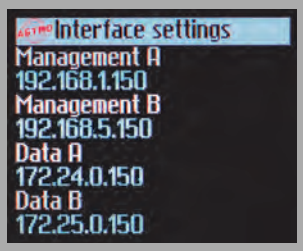
Figure 1, top:
U 194, installed in the U 100 base unit (fitted with three plug-in modules)

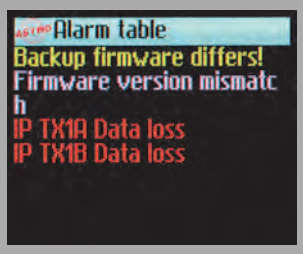
Figure 1, middle:
U 194, front panel
[1] Screw for the front panel
[2] Display for management IP addresses, data IP addresses, status messages, etc.
[3] Status display
[4] Control and data knob, menu switch

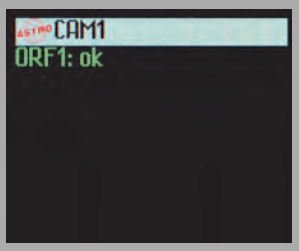
Figure 1, bottom:
U 194, front panel after removal
[5] Release button, CI-slot 1
[6] Release button, CI-slot 2
[7] Release button, CI-slot 3
[8] Release button, CI-slot 4

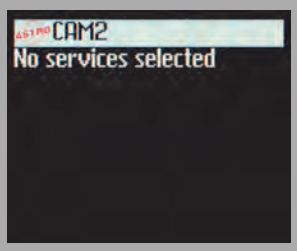












NOTE: Turning the data knob [4] (fig. 2, above) allows you to navigate through the individual menu items in the U 194 display. Press the data knob to activate the display.

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

Turning the data knob clockwise allows to 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.
- Alarm table: The current error messages are displayed.
- CAM (example at left: CAM 1 and 2): The services selected for the CAM module are displayed.

The different text colours refer to:

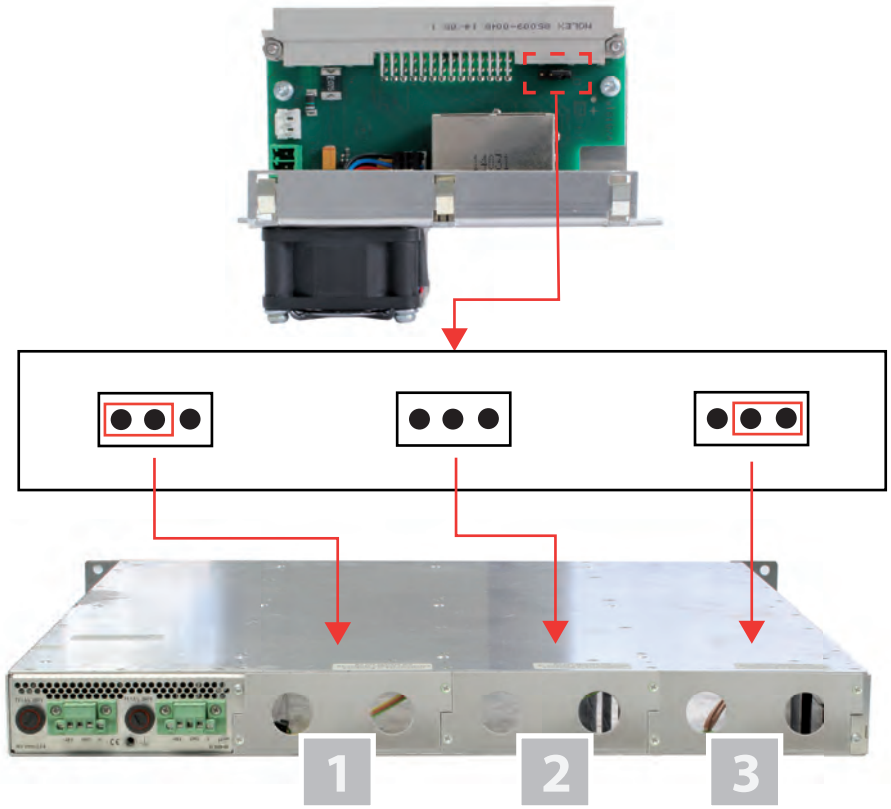
- Red: Error (the corresponding display in the web interface log book is: “error”)
- Yellow: Warning (the corresponding display in the web interface log book is: “warning”)
- Purple: Critical error (the corresponding display in the web interface log book is: “critical / alert / emergency”)
- Light blue: 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”)

Connecting and installing the module

NOTE: How to prepare the base unit for installing the module is described in the operation manual of the U 100 base unit!

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

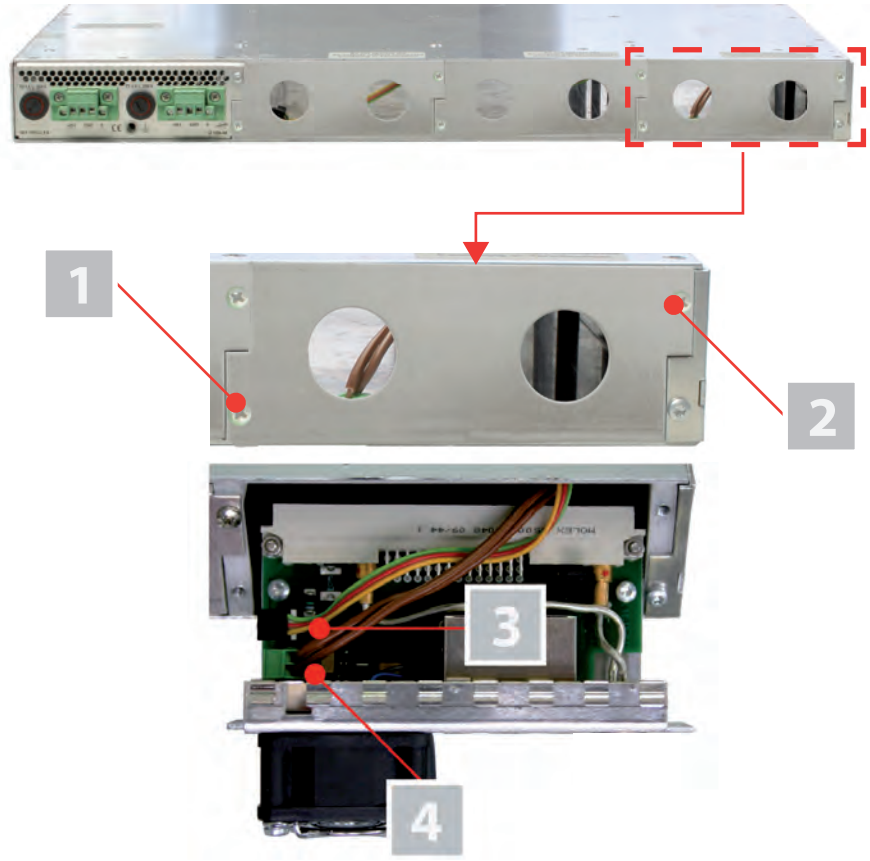
Figure 2: Coding the backplane by plugging in the bridge

To prepare the backplane for installation, proceed as follows:

Plug the bridge into the installation position provided in accordance with figure 3 (page 8).

NOTE: A bridge 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

TASK

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.

RESULT:

The backplane is now connected and installed. Once installed, it should correspond to the figure at the left.
Once you have installed the module, you can insert the CI cards of your choice.

NOTE: You can learn how to connect a plug-in module to your PC or laptop by reading the operating manual for the respective signal converter.

Inserting CI cards

NOTE: CI cards can also be inserted and removed while the module is operating.

Before you can insert the CI cards, you must undo the screw connection [1] on the front panel of the U 194 (see fig. 2, below) and remove the front panel together with the display. The four CI slots and the release buttons for ejecting the CI modules are visible.
Start by pushing each CI card into a CI module, and then push each module into one of the four CI slots in the U 194.
To remove a CI module, press the corresponding eject button and remove the respective module.

[1] Screw for the front panel
[5] Release button, CI-slot 3
[6] Release button, CI-slot 4
[7] Release button, CI-slot 3
[8] Release button, CI-slot 4

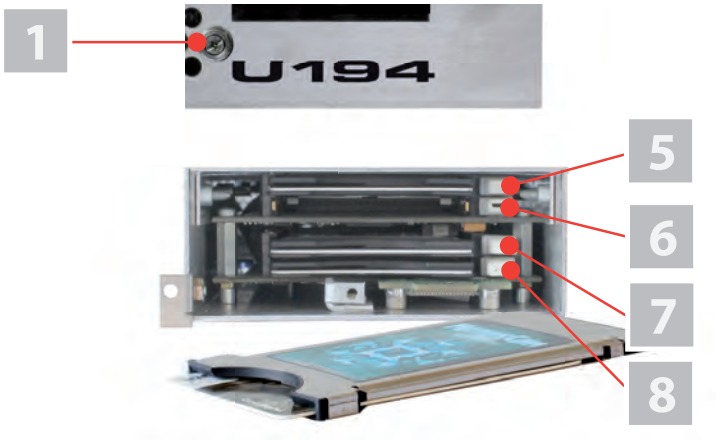
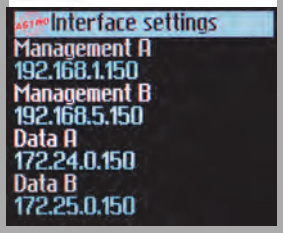


Figure 4: CI slots

Quick start - starting operation of the U 194



Connecting the U 194 to a PC or laptop

To be able to configure the U 194, 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 194 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.

NOTE: Please note that your PC or laptop must be in the same sub-network as the U 194! The sub-network mask of the U 194 is set to 255.255.255.0 upon delivery. The PC or laptop which is connected must therefore be given an IP address 192.168.1x.

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:

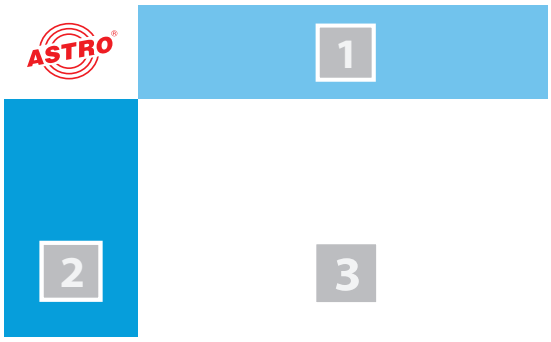


Figure 5: Structure of the web browser interface

- **Status line (header) [1]:** displays general information on the module.
  SW: Software status
  FW: Current version of the software installed
  HW: Hardware version
  Up: Runtime since the system was booted
  Time: Date and time
  Name, location, contact: corresponds to the settings made in the configuration area “User settings”
- **Navigation menu [2]:** displays the individual configuration areas which you can select 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.

NOTE: 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, copy the IP address of the U 194 shown in the device display into the address line of the browser. The menu page “Main” 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

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

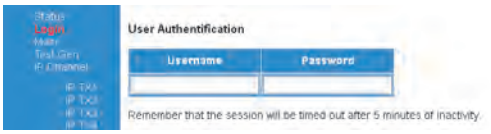


Figure 6: Log in

After logging in, the start page of the U 194 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 U 194 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”.

NOTE: 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

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 pane:

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	on off	on off	on off	on 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

Submit Reset Form

Figure 7: 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 194

The overview on page 11 shows the possible signal paths for the U 194. The specific signal flow can be split into the following sub-areas:

- ☐ The IP receivers (1 to 4) receive a signal via data port A or B (each is switchable).
- ☐ The signals from the four IP receivers are forwarded to the CAM modules (1 to 4) via a multiplexer (the overview shows, as an example, the signal from receiver 1 to CAM 1 and the signal from receiver 3 to CAM 2; see the red line connecting them).
- ☐ Each output signal from the four CAM modules can also be forwarded to the IP transmitters (1 to 4) via another multiplexer (the overview shows, as an example, the signal from CAM 2 to transmitter 1, the signal from CAM 3 to transmitter 3; see the red line connecting them).
- ☐ Each output signal from the four IP transmitters can be forwarded to data port A and/or data port B respectively.

NOTE: It is also possible to feed the output signals from the four CAM modules to another CAM module again via the first multiplexer (cascading).
The output signal from the four IP receivers can – if required – be looped through to the second multiplexer by bypassing the CAM modules.

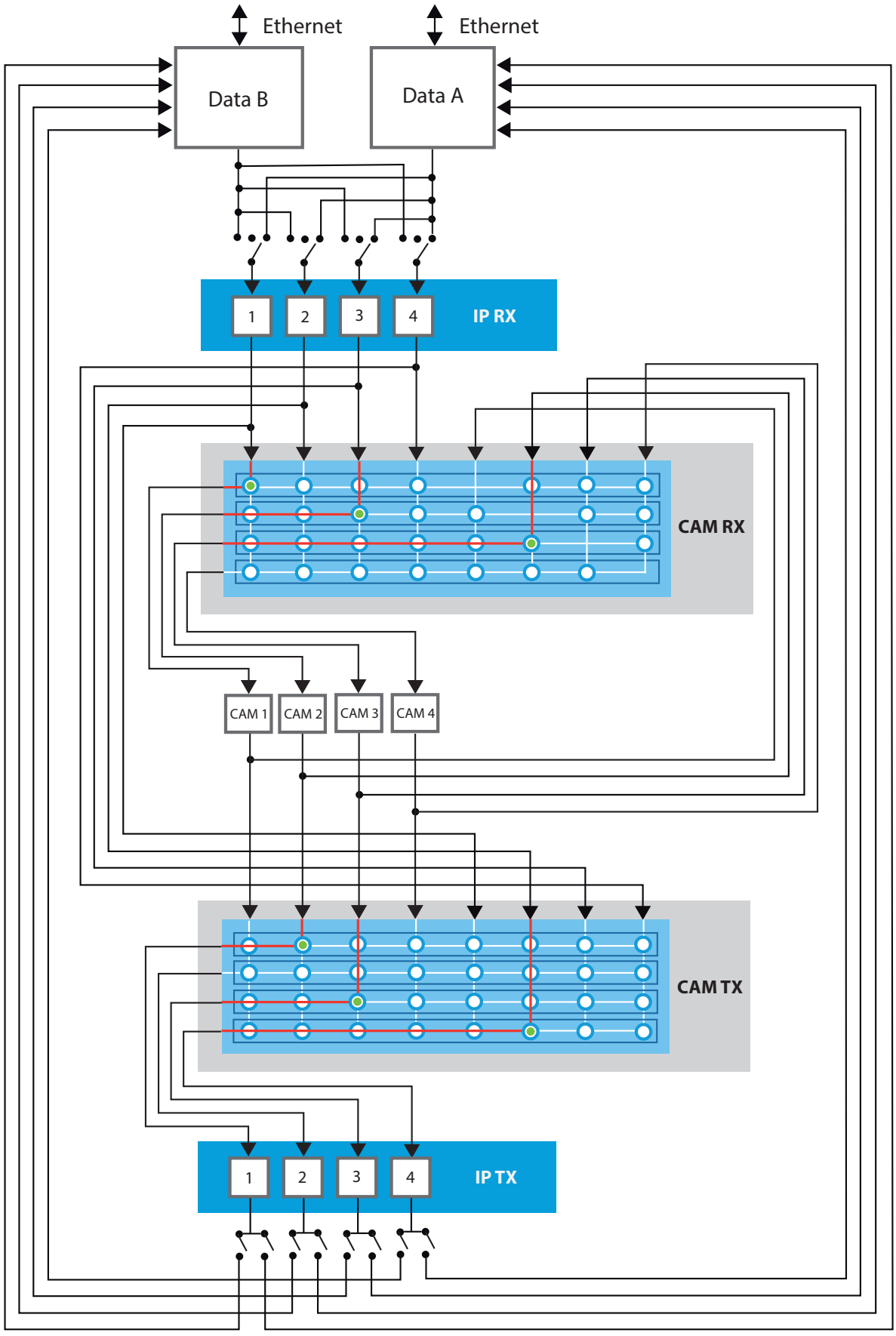


Figure 8: The signal flow in the U 194

Configuring the IP receiver

Now start configuring a signal path in the U 194. Start by clicking on the item “IP RX 1” in the web browser interface menu. You will now see the following table:

IP RX1 Channel Settings

Property	Data A (eth2) 1G	
Primary Receive IP:Port	232 . 19 . 100 . 136 : 10000	Priority
Primary Source Select	0 . 0 . 0 . 0	12 Highest/Hot

Figure 9: Setting the source for the data stream

Enter the IP address and port for the data source in the first line. Optionally, you can also enter a source select address in the second line.
Further information about configuring the receiver can be found in the section “Configuring IP inputs”.
There is another table below the “IP RX 1 Channel Settings” table. Activate the radio button “on” to switch on the receiver.

Property	Data A (eth2) + Data B (eth3)	
Enable	on off	
Port	Data A Primary static	
Timeouts	in case of failure switch after 0 seconds, switch back to higher priority after 300 seconds.	
Encapsulation	RTP/UDP/IP UDP/IP	automatic manual
Bitrate	Single PCR (SPTS) Mult. PCR (MPTS)	automatic manual
FEC	on off	
TSID / ONID	1117	1
Alias manual / automatic		ORF1, ORF

Figure 10: Activating the connection to the data port

Checking the data reception 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	0.0 Mbit/s	0.0 Mbit/s
Receive	0.0 Mbit/s	0.0 Mbit/s	35.4 Mbit/s	35.5 Mbit/s

Ethernet frames

Property	Data A (eth2) 1G	Data B (eth3) 1G
Total frames sent by host	117	69
Total frames sent to host	1727	1727
Total exception frames sent to host	313	29
Total errored frames received	0	0
Total frames discarded by deencapsulator	2365105	145
Total frames discarded because of lack of buffers	0	0
Total receive frames forwarded to IP RX 1 / per sec.	4180910 / 3214 0 / 0 0 / 0	4180912 / 3214 0 / 0 0 / 0

Figure 11: Displaying reception statistics

A data reception rate > 0 at data ports A or B should now appear in the line “Receive” in the “Ethernet bandwidth” table.
The number of frames forwarded to the receiver RX 1 should now appear in the “Total receive frames to RX 1” line in the “Ethernet frames” table. The value behind the slash indicates the frame rate per second.

Ethernet RX

Channel	Encap	TS Rate	Buffer depth	FEC	Valid	Missing	Fixed	Duplicate	Reordered	Out of range
IP RX1	1328 bytes 7 packets RTP/UDP/IP	33.8 Mbit/s Mult. PCR	255 Frames 49.8 % 79.5 ms	none	4410949	0	0	0	0	0

Figure 12: IP transmitter statistics

Details about the transport stream received are provided in the “Ethernet RX” table. A TS rate of > 0 should be displayed. If this is not the case, check the receiver settings.

Setting the signal routing to the CAM modules

Now insert the required CI module into the first slot of the U 194 if you have not already done so. Proceed as described in the section “Connecting and installing the module”.

Click on the item “CAM RX” in the web browser interface menu. You will now see the following table:

CAM RX Settings

	Alias	ORF1 ORF				ORF1 ORF	ORF1 ORF	ASTRO ASTRO	ASTRO ASTRO	ASTRO
	TSID ONID	1117 1	0 0	0 0	0 0	1117 1	1117 1	65535 65535	65535 65535	65535 65535
	Status	IP RX1	IP RX2	IP RX3	IP RX4	CAM 1	CAM 2	CAM 3	CAM 4	Test Gen.
CAM 1	running	◉	○	○	○		○	○	○	○
CAM 2	not installed	◉	○	○	○	○		○	○	○
CAM 3	not installed	○	○	○	○	○	○		○	◉
CAM 4	not installed	○	○	○	○	○	○	○		◉

Figure 13: Signal routing to the CAM modules

In the switch matrix, click on the radio button which connects the receiver IP RX 1 to CAM module 1.

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

More information on signal routing can be found in the section “Configuring signal paths using the switch matrix”.

Now click on the item “CAM 1” in the menu at the left. (You may have to press the refresh button in your browser several times to update the page.) You will now see the following table:

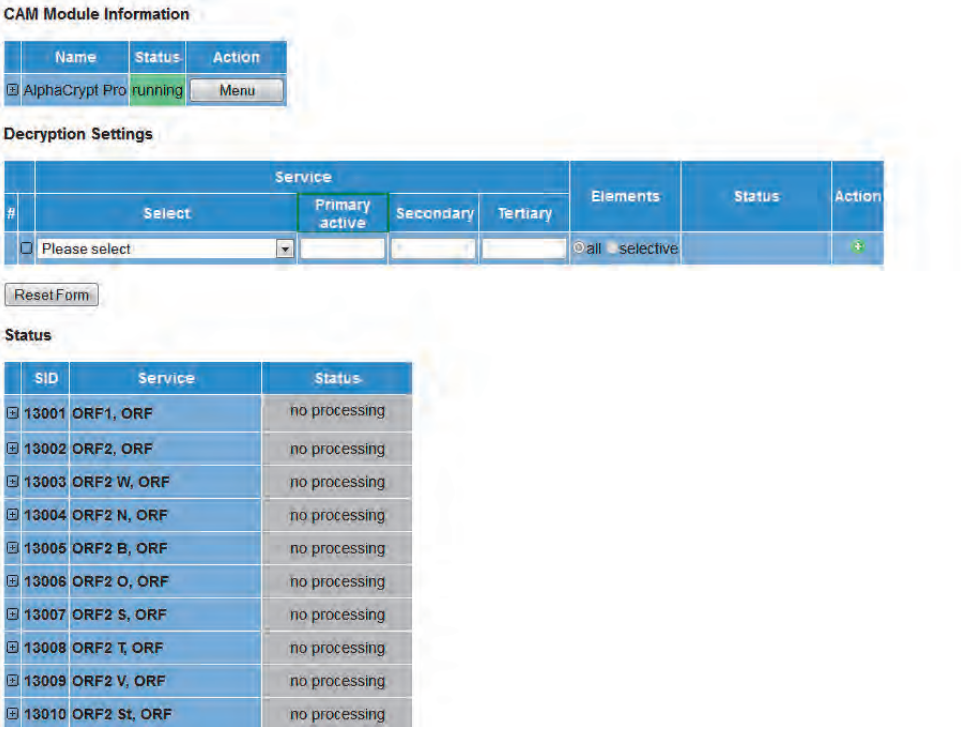
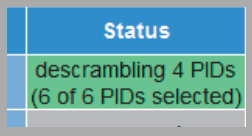


Figure 14: CAM settings

A list of the individual services which the module CAM 1 is receiving appears in the “Status” table. You can select the service for decryption in the “Decryption Settings” table. To add a service, click on the plus symbol in the right-hand column.
More information on decryption settings can be found in the section “Setting the decryption”.



When decryption is successful, a text which is highlighted in green appears in the status column (example: see figure at left).

Setting the signal routing to the IP transmitters

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

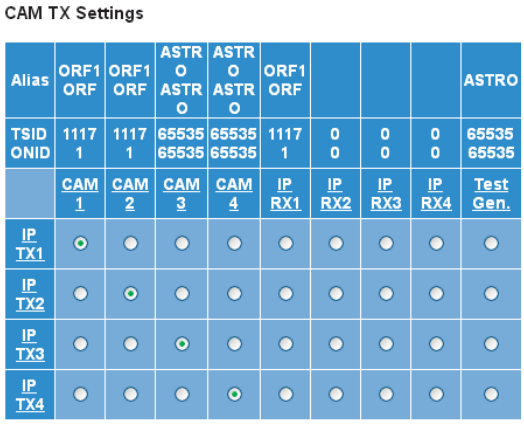


Figure 15: Signal routing to the IP transmitters

Submit Reset Form

In the switch matrix, activate the radio button which connects CAM module 1 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 section “Configuring signal paths using the switch matrix”.

Configuring the IP transmitter

To complete the process, you should now configure and activate the IP transmitter. To do so, click on 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	on / off	on / off
Transmit IP:Port	172 . 24 . 0 . 150 : 0	172 . 25 . 0 . 150 : 0
Destination IP:Port	232 . 22 . 100 . 128 : 10000	232 . 21 . 100 . 128 : 10000
Destination MAC	01:00:5e:16:64:80	01:00:5e:15:64:80
TOS / TTL	184 . 1	184 . 1
VLAN (Set 0 to disable)	0	0

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	7
Protocol Encapsulation	RTP/UDP/IP / UDP/IP
FEC (L Cols / D Rows / Interleaving)	Off / Off / Col only / Plain

Figure 16: 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 transmitter can be found in the section “Configuring IP outputs”.

Submit Reset Form

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	35.5 Mbit/s	35.5 Mbit/s
Receive	0.0 Mbit/s	0.0 Mbit/s	35.5 Mbit/s	35.5 Mbit/s

Ethernet frames

Property	Data A (eth2) 1G	Data B (eth3) 1G
Total frames sent by host	118	70
Total frames sent to host	1746	1746
Total exception frames sent to host	313	29
Total errored frames received	0	0
Total frames discarded by deencapsulator	2365108	145
Total frames discarded because of lack of buffers	0	0
Total transmit frames generated from IP TX 1 / per sec.	30426244 / 3208	30426245 / 3209
Total receive frames forwarded to IP RX 1 / per sec.	4411544 / 3208 0 / 0 0 / 0	4411546 / 3208 0 / 0 0 / 0

Ethernet TX

Property	Value
Minimum FEC Freelist	254
Maximum output queue depth	0

Figure 17: 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 “Displaying statistics”.

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 “Configuring IP interfaces, IP management and base unit”).

"Status" menu

To have the current settings for the U 194 displayed, click on the item `Status` in the menu at the left. The overview shown in figure 14 appears:

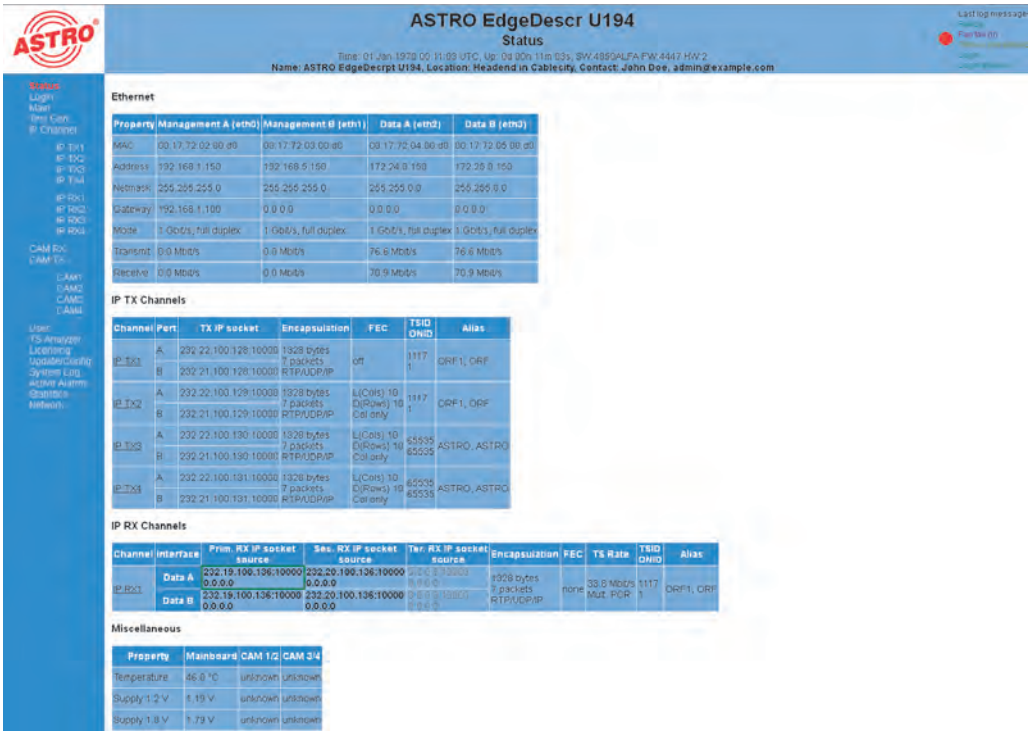


Figure 18: Status display

The following tables appear:

Ethernet status

Ethernet port settings and status data

Ethernet

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
Address	192.168.1.150	192.168.5.150	172.24.0.150	172.25.0.150
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	1 Gbit/s, full duplex	1 Gbit/s, full duplex	1 Gbit/s, full duplex
Transmit	0.0 Mbit/s	0.0 Mbit/s	76.6 Mbit/s	76.6 Mbit/s
Receive	0.0 Mbit/s	0.0 Mbit/s	70.9 Mbit/s	70.9 Mbit/s

Figure 19: Status display – Ethernet

In accordance with the four connections on the backplane of the U 194 (Data A, Data B, Management A and Management B, see section "Device description"), the values for the following parameters are displayed, or set, here:

- `MAC:` MAC address (display value)
- `Address:` IP address (can be set)
- `Netmask:` Net mask (can be set)
- `Gateway:` Gateway IP address (can be set)
- `Mode:` Ethernet mode (display value)
- `Transmit:` Transmission data rate (display value)
- `Receive:` Reception data rate (display value)

IP transmitter status display:

IP TX Channels

Channel	Port	TX IP socket	Encapsulation	FEC	TSID ONID	Alias
IP TX1	A	232.22.100.128:10000	1328 bytes 7 packets RTP/UDP/IP	off	1117 1	ORF1, ORF
	B	232.21.100.128:10000				
IP TX2	A	232.22.100.129:10000	1328 bytes 7 packets RTP/UDP/IP	L(Cols) 10 D(Rows) 10 Col only	1117 1	ORF1, ORF
	B	232.21.100.129:10000				
IP TX3	A	232.22.100.130:10000	1328 bytes 7 packets RTP/UDP/IP	L(Cols) 10 D(Rows) 10 Col only	65535 65535	ASTRO, ASTRO
	B	232.21.100.130:10000				
IP TX4	A	232.22.100.131:10000	1328 bytes 7 packets RTP/UDP/IP	L(Cols) 10 D(Rows) 10 Col only	65535 65535	ASTRO, ASTRO
	B	232.21.100.131:10000				

Figure 20: Status display – IP TX channels

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

- `TX IP socket:` Target 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"

IP receiver status display:

IP RX Channels

Channel	Interface	Prim. RX IP socket source	Sec. RX IP socket source	Ter. RX IP socket source	Encapsulation	FEC	TS Rate	TSID ONID	Alias
IP RX1	Data A	232.19.100.136:10000 0.0.0.0	0.0.0.0:0 0.0.0.0	0.0.0.0:0 0.0.0.0	1328 bytes 7 packets RTP/UDP/IP	none	33.8 Mbit/s Mult. PCR	1117 1	ORF1, ORF
	Data B	232.19.100.136:10000 0.0.0.0	0.0.0.0:0 0.0.0.0	0.0.0.0:0 0.0.0.0					
IP RX2	Data A	232.21.100.128:10000 0.0.0.0	0.0.0.0:0 0.0.0.0	0.0.0.0:0 0.0.0.0	0 bytes 0 packets UDP/IP	none	0.0 Mbit/s Mult. PCR	0 0	
	Data B	232.21.100.128:10000 0.0.0.0	0.0.0.0:0 0.0.0.0	0.0.0.0:0 0.0.0.0					

Figure 21: Status display – IP RX channels

The text formatting has the following meaning:

- green: active
- grey: inactive ("off")
- black (bold): priority "hot", no errors
- red (bold): priority "hot", errors
- black (standard): priority "cold", no errors
- red (standard): priority "cold", errors

The values set for the following parameters are displayed in the "IP RX Channels" table for the four IP receivers – for Data A and B outputs respectively:

- `Prim. RX IP socket source:` Primary source
- `Sec. RX IP socket source:` Secondary source
- `Ter. RX IP socket source:` Tertiary source
- `Encapsulation:` Data encapsulation
- `FEC:` Forward error correction
- `TS Rate:` Data rate
- `TSID/ONID:` Transport stream ID / original network ID
- `Alias:` Alias name

Details on the parameters can be found in the section "Menu IPTX"

Status messages on temperature, internal voltages and the power supply unit:

Miscellaneous

Property	Mainboard	CAM 1/2	CAM 3/4
Temperature	46.0 °C	unknown	unknown
Supply 1.2 V	1.19 V	unknown	unknown
Supply 1.8 V	1.79 V	unknown	unknown
Supply 2.5 V	2.49 V	unknown	unknown
Supply 3.3 V	3.31 V	unknown	unknown
Supply 5.0 V	4.99 V	unknown	unknown
Supply 13 V	12.95 V	n/a	n/a
Fan	0 RPM		
Power Module 1	OK		
Power Module 2	OK		

Figure 22: Status display – Miscellaneous

The following parameters, which are of a general nature, are displayed in the “Miscellaneous” table:

- `Temperature:` Temperature display in °C for the mainboard, as well as CAM 1/2 and CAM 3/4
- `Supply 1.2 V:` Supply voltage 1.2 volts
- `Supply 1.8 V:` Supply voltage 1.8 volts
- `Supply 2.5 V:` Supply voltage 2.5 volts
- `Supply 3.3 V:` Supply voltage 3.3 volts
- `Supply 5.0 V:` Supply voltage 5.0 volts
- `Supply 13 V:` Supply voltage 13 volts (mainboard only)
- `Fan:` Speed of fan rotation
- `Power Module 1:` Function status (OK or error message)
- `Power Module 2:` same as module 1

Memory status:

Property	Value
Total size of memory arena	63213380
Number of ordinary memory blocks	126
Space used by ordinary memory blocks	795952
Space free for ordinary blocks	62417404
Size of largest free block	62377284
Number of left files FOPEN_MAX	27
Number of left files NFILE	18
Number of free file descriptors NFD	18
CPU load 0.1s	0 %
CPU load 1s	3 %
CPU load 10s	11 %

Figure 23: Status display – System resources

A number of items of information about the internal resources of the operating system are visible in the “System Resources” table. No settings can be made here.

File resources:

- `Number of left files FOPEN_MAX`
- `Number of left files NFILE`
- `Number of free descriptors NFD`

CPU load, averaged over XXs:

- `CPU load 0.1 s`
- `CPU load 1 s`
- `CPU load 10 s`

"Main" menu

This section describes how you can make general settings for the interfaces and management of the U 194, as well as for the U 100 base unit.
Click on the item "Main" in the menu at the left.

Setting IP interfaces

You can configure, activate and deactivate the IP interfaces in the upper table ("IP Interface Settings"). The connection type is automatically identified and displayed by the U 194 (in this example: 1 Gbit/s, full duplex).

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	on off	on off	on off	on 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 24: 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 it.
- `Mode:` Connection type (identified automatically)
- `Address:` IP address
- `Subnet:` Netmask
- `Broadcast:` Broadcast address
- `Gateway:` Gateway IP (if required)

NOTE: When programming the IP addresses, make sure the addresses are not already allocated within your network. Address conflicts lead to malfunctions in the network. (Please set any unused parameters to 0.0.0.0.)

Submit Reset Form

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

Entering management settings

The second table ("IP management settings") allows you to configure the following 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 25: Configuring management settings

- `DNS:` If required, enter a DNS server in the input fields.
- `SNTP server:` You can enter one or two time servers here (SNTP protocol).
- `Time Source:` Select the preferred time reference from the drop-down menu. The following options are available for selection: "SNTP server" and "IP RX 1 - 4".

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").

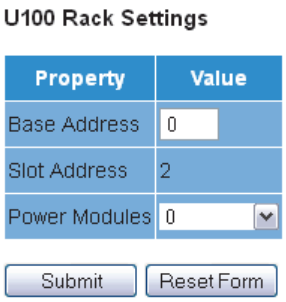


Figure 26: Configuring the U 100 base unit

The following parameters are displayed and can be configured:

- `Base Address:` Enter an address for the base unit being used. If the U 194 is managed using the U 100-C controller and there are several U 100 base units in use, then you must allocate an individual address to each base unit.
  This setting only needs to be entered for one module each per base unit.
- `Slot Address:` An address corresponding to the previous coding of the backplane of the U 194 (see section "Installation and connection") is displayed for the slot in the base unit.
- `Power Modules:` Select the number of power supply units being used from the drop-down menu ("0" for 48-volt operation, "1" or "2" for 230-volt power supply units).

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

Saving and loading configurations / default and reboot

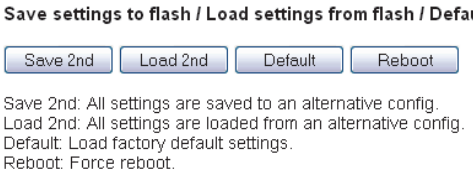


Figure 27: Saving and loading configurations

Any changes to the configuration of the U 194 are written to the device using the "Submit" button, which activates them 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 on the SD card in the U 194. Clicking on the "Load 2nd" button allows you to open this status again. Saving the configuration to a local computer or FTP server is explained in the "Software update and configuration files" chapter.

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

ATTENTION: If you click on the "Default" button, all settings, except for the user and network settings for the data and management ports, will be reset to the state on delivery!

Click on the "Reboot" button to perform a restart using the last settings saved.

"Test generator" menu

The U 194 features an integrated test generator for checking the functions when an input signal is still not available. Null packets with a predefined packet ID are generated. The maximum data rate that can be set is 67 MBit/s.

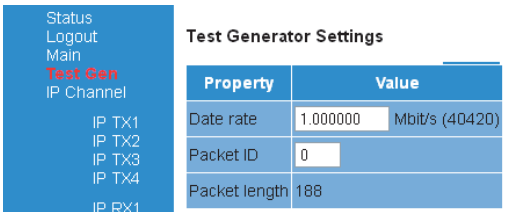


Figure 28: Test generator

The following settings are displayed and can be entered:

- `Data rate:` Enter the required data rate in MBit/s in the input field.
- `Packet ID:` Enter the packet ID here.
- `Packet length:` Displays the packet length.

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

"IP channel" menu

To have the input masks for the configuration of the input and output channels displayed, click on the item "IP Channels" in the menu at the left.

Checking settings for the IP outputs

The table at the top, "IP TX Channel Settings", allows you to check the settings for the output channels and to activate or deactivate the individual channels.

IP TX Channel Settings

Channel	Enable	Length	Packets	Mode	Destination IP socket	UDP src	TOS	TTL	VLAN
IP TX1	Data A: on off Data B: on off	188	7	RTP/UDP/IP	232.22.100.128:10000 232.21.100.128:10000	0 0	184 184	1 1	0 0
IP TX2	Data A: on off Data B: on off	188	7	RTP/UDP/IP	232.22.100.129:10000 232.21.100.129:10000	0 0	184 184	1 1	0 0
IP TX3	Data A: on off Data B: on off	188	7	RTP/UDP/IP	232.22.100.130:10000 232.21.100.130:10000	0 0	184 184	1 1	0 0
IP TX4	Data A: on off Data B: on off	188	7	RTP/UDP/IP	232.22.100.131:10000 232.21.100.131:10000	0 0	184 184	1 1	0 0

Figure 29: IP TX Channel Settings table

The "Enable" column allows you to activate or deactivate re-routing of the output signal to ports A and B respectively by clicking the corresponding radio button.

The following parameters are displayed for the four IP output channels:

- `Length:` Packet length
- `Packets:` TS packets per IP packet
- `Mode:` Protocol encapsulation (RTP / UDP / IP or UDP / IP)
- `Destination IP socket:` Destination address / port
- `UDP src:` UDP source
- `TOS:` Type of service
- `TTL:` Time to live
- `VLAN:` Virtual LAN ID

Checking settings for the IP inputs

The table at the bottom, "IP RX Channel Settings", allows you to check the settings for the input channels.

IP RX Channel Settings

Channel	Enable	Interface	Prim. RX IP socket source	Sec. RX IP socket source	Ter. RX IP socket source	Encapsulation	TSID ONID	Alias
IP RX1	on off	Data A	232.19.100.136:10000 0.0.0.0	232.20.100.136:10000 0.0.0.0	0.0.0.0:10000 0.0.0.0	RTP/UDP/IP Mult. PCR	1117 1	ORF1, ORF
		Data B	232.19.100.136:10000 0.0.0.0	232.20.100.136:10000 0.0.0.0	0.0.0.0:10000 0.0.0.0			
IP RX2	on off	Data A	232.19.100.129:10000 0.0.0.0	0.0.0.0:0 0.0.0.0	0.0.0.0:0 0.0.0.0	UDP/IP Mult. PCR		
		Data B	232.19.100.129:10000 0.0.0.0	0.0.0.0:0 0.0.0.0	0.0.0.0:0 0.0.0.0			
IP RX3	on off	Data A	232.19.100.130:10000 0.0.0.0	0.0.0.0:0 0.0.0.0	0.0.0.0:0 0.0.0.0	RTP/UDP/IP Single PCR		
		Data B	232.19.100.130:10000 0.0.0.0	0.0.0.0:0 0.0.0.0	0.0.0.0:0 0.0.0.0			
IP RX4	on off	Data A	232.19.100.132:10000 0.0.0.0	0.0.0.0:0 0.0.0.0	0.0.0.0:0 0.0.0.0	RTP/UDP/IP Mult. PCR		
		Data B	232.19.100.132:10000 0.0.0.0	0.0.0.0:0 0.0.0.0	0.0.0.0:0 0.0.0.0			

Figure 30: IP RX Channel Settings table

You can activate or deactivate the respective IP inputs here by clicking the corresponding radio button. The following parameters are displayed for the four IP input channels for ports A and B respectively:

- ☐ `Prim. RX IP socket source`
- ☐ `Sec. RX IP socket source`
- ☐ `Ter. RX IP socket source`
- ☐ `Encapsulation TSID / ONID`
- ☐ `Alias`

NOTE: A description of these parameters can be found in the section "Menu IP RX".

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

"IP RX" 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. You will then see the following table at the top of the content area:

IP RX1 Channel Settings

Property	Data A (eth2) 1G	
Primary Receive IP:Port	232 . 19 . 100 . 136 : 10000	Priority
Primary Source Select	0 . 0 . 0 . 0	12 Highest/Hot
Secondary Receive IP:Port	232 . 20 . 100 . 136 : 10000	Priority
Secondary Source Select	0 . 0 . 0 . 0	11 Higher/Hot
Tertiary Receive IP:Port	0 . 0 . 0 . 0 : 10000	Priority
Tertiary Source Select	0 . 0 . 0 . 0	0 Off

Figure 31: "IP RX1 Channel Settings" table

"Receive IP" and "Port" (see rows 1, 3 and 5 in the table) form a socket for the reception of an incoming data stream. The receiver IP address can be a multicast address or an individual unicast address. To request an IP multicast, the IGMP protocol is used. If version 3 of this protocol is used, then a specific source can be selected using the source select IP address (see rows 2, 4 and 6 in the table). If this function should not be used, please enter zero in the input field four times. (This is, for example, the case when IGMP version 2 or IGMP version 3 from any source is being used as a protocol.)

You can use the drop-down menu to enter a priority setting for primary, secondary and tertiary IP addresses / ports respectively. There are 13 options (from "Off" to "Highest/Hot") to choose from. The priorities are divided into three groups:

- Hot standby (higher priorities): Levels 7 - 12: data streams are requested on an ongoing basis
- Cold standby (medium priorities): Levels 1 - 6
- "Off"

As a rule – providing the network provider is not affected by any faults – the data stream with the highest priority is received and used for subsequent processing. In the event of a fault – fallout of an incoming signal – a switch-over to the data stream with the next-highest priority will occur.

Should a priority level from the "Hot standby" group be allocated to a data stream, then this will continue to be requested when the network provider is affected by a fault. As soon as the fault has been eliminated, it will switch back to this data stream.

Another table follows in which you can enter settings valid for Data Port A and B:

Property	Data A (eth2) + Data B (eth3)	
Enable	on / off	
Port	Data A / Primary / static	
Timeouts	in case of failure switch after 0 seconds, switch back to higher priority after 300 seconds.	
Encapsulation	RTP/UDP/IP / UDP/IP	automatic / manual
Bitrate	Single PCR (SPTS) / Mult. PCR (MPTS)	automatic / manual
FEC	on / off	
TSID / ONID	1117	1
Alias manual / automatic		ORF1, ORF

Figure 32: "IP RX1 Channel Settings" table 2

- `Enable:` Activate or deactivate the IP input by clicking the corresponding radio button.
- `Port:` Configure the reception source for the IP channel here.
  Select either port, Data A or Data B, from the first drop-down menu.
  Select one of the options, "Primary", "Secondary" or "Tertiary", from the second drop-down menu.
  Select the option "static" from the third drop-down menu if automatic data stream circuit replacement is not required. Select the option "automatic" if the replacement circuit should be used as described above.
- `Timeouts:` Enter a time span in seconds in the first input field, after which the unit should switch over to the data stream with the next-lowest priority in the event of a fault.
  Enter a time span in seconds in the second input field, after which the unit should switch back to the data stream with the next-highest priority after the fault has been eliminated. (This is only the case when a priority stream from the "Hot standby" group was allocated to the data stream (see description further above).
- `Encapsulation:` When the radio button "RTP / UDOP / IP" is activated, the RTP / UDP / IP data streams are received accordingly. If you activate the radio button "on" in the "FEC" row, the receive IP ports +2 and +4 will also be received (example: 10002 and 10004 in addition to 10000). This includes additional redundancy information for fault correction.
  When the radio button "UDP / IP" is activated, reception of either UDP / IP data streams or RTP / UDP / IP data streams without an evaluation of RTP is possible.
  For data encapsulation, either select "automatic" or "manual" by clicking the corresponding radio button.
- `Bitrate:` For data encapsulation, select either "automatic" or "manual" by clicking the corresponding radio button. If "manual" was selected and the radio button "Single PCR" is activated at the same time, the reception data stream will be regulated using one single PCR. This is not suitable for transport streams with several PCRs.
  When you activate the radio button "Multi PCR", regulation will occur using the data rate. This is not possible for data streams with variable bit rates.
- `FEC:` Activate or deactivate the FEC by clicking the radio button "on" or "off". (See "Encapsulation" further above.)
- `TSID / ONID:` The respective value is displayed, cannot however be changed.
- `Alias manual / automatic:` You can enter an alias for the data stream in the input field at the left. The automatically generated alias is displayed at the bottom right. This is the name of the first station in the data stream. This is used if you do not enter a name manually.

Click on the "Submit" button below the last table to save your changes.
Click on "Reset Form" to restore the original settings.

"IP TX" menu

To configure the four IP inputs, start by clicking on the item "IP TX1", "IP TX2", "IP TX3" or "IP TX4" in the menu at the left. You will then see the following table at the top of the content area:

IP TX1 Channel Settings

Property	Data A (eth2) 1G	Data B (eth3) 1G
Enable	on / off	on / off
Transmit IP:Port	172 . 24 . 0 . 150 : 0	172 . 25 . 0 . 150 : 0
Destination IP:Port	232 . 22 . 100 . 128 : 10000	232 . 21 . 100 . 128 : 10000
Destination MAC	01:00:5e:16:64:80	01:00:5e:15:64:80
TOS / TTL	184 1	184 1
VLAN (Set 0 to disable)	0	0

Figure 33: "IP TX1 Channel Settings" table 1

You can activate or deactivate re-routing of the selected IP output to ports A and B respectively by clicking the corresponding radio button. The respective MAC address is displayed for ports A and B ("Destination MAC").
You can enter a value for ports A and B respectively for the following parameters:

- `Transmit IP: Port:` Enter an IP transmission address
- `Destination IP: Port:` Enter the IP address of a reception device
- `TOS / TTL:` Enter a value for the „Type of service" (serves the priorisation of the IP data packets)./ Enter a value for lifetime („Time to live").
- `VLAN (Set 0 to disable):` Enter the address of a virtual local network.

Another table follows in which you can enter settings valid for Data Port A and B:

Property	Data A (eth2) + Data B (eth3)
TS Packets per Frame	7
Protocol Encapsulation	RTP/UDP/IP / UDP/IP
FEC (L Cols / D Rows / Interleaving)	Off / Off / Col only / Plain

Figure 34: "IP TX1 Channel Settings" table 2

- `TS Packets per Frame:` 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" 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) or "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.

Submit Reset Form

Click on the "Submit" button below the last table to save your changes.
Click on "Reset Form" to restore the original settings.

"CAM RX" menu

This section describes how to route data onto a CAM module.

NOTE: An overview of the possible signal paths can be found in the section "Quick start – starting operation of the U 194".

Start by clicking on the item "CAM RX" in the menu at the left. You will now see the following table:

CAM RX Settings

	Alias	ORF1 ORF				ORF1 ORF	ORF1 ORF	ASTRO ASTRO	ASTRO ASTRO	ASTRO
	TSID ONID	11171	00	00	00	11171	11171	65535 65535	65535 65535	65535 65535
	Status	IP RX1	IP RX2	IP RX3	IP RX4	CAM 1	CAM 2	CAM 3	CAM 4	Test Gen.
CAM 1	running	◉	○	○	○		○	○	○	○
CAM 2	not installed	◉	○	○	○	○		○	○	○
CAM 3	not installed	○	○	○	○	○	○		○	◉
CAM 4	not installed	○	○	○	○	○	○	○		◉

Figure 35: Input switch matrix "CAM RX Settings"

	Status	IP RX1	IP RX2	IP RX
CAM 1	running	◉	○	○
CAM 2	not installed	◉	○	○
CAM 3	not installed	○	○	○
CAM 4	not installed	○	○	○

You can re-route an IP input signal to one, or several, CAM modules respectively by clicking on the corresponding radio button. In the example at the left, the signal from input 1 is re-routed to CAM modules 1 and 2.
The "Status" column displays whether the respective CAM module is installed. If this is the case, then "running" is displayed as the status when the module is functioning properly. Otherwise, an error message highlighted in red is displayed. If no module has been installed, the display shows "not installed".

CAM 1	CAM 2	CAM 3	CAM 4
	○	○	○
○		○	○
○	○		○
○	○	○	

Furthermore, you can re-route the signal from the output of each CAM module into one of the inputs for the three other CAM modules by activating the corresponding radio button (cascading).

If an input signal has not become available, you can also re-route the signal from the test generator (see
section "Test generator") to the respective CAM module.

The respective transport stream ID, the network ID and the alias for every source is displayed in the upper part of the table.

Submit | Reset Form

Click on the "Submit" button below the table to save your changes.
Click on "Reset Form" to restore the original settings.

NOTE: You will find an example of configuration in the section "Quick start – starting operation of the U 194".

"CAM TX" menu

You can configure the routing to the IP transmitters using this menu item.

NOTE: An overview of the possible signal paths can be found in the section "Quick start – starting operation of the U 194".

Start by clicking on the item "CAM TX" in the menu at the left. You will now see the following table:

CAM TX Settings

Alias	ORF1 ORF	ORF1 ORF	ASTRO ASTRO	ASTRO ASTRO	ORF1 ORF				ASTRO
TSID ONID	1117 1	1117 1	65535 65535	65535 65535	1117 1	0 0	0 0	0 0	65535 65535
	CAM 1	CAM 2	CAM 3	CAM 4	IP RX1	IP RX2	IP RX3	IP RX4	Test Gen.
IP TX1	◉	○	○	○	○	○	○	○	○
IP TX2	○	◉	○	○	○	○	○	○	○
IP TX3	○	○	◉	○	○	○	○	○	○
IP TX4	○	○	○	◉	○	○	○	○	○

Figure 36: Output switch matrix "CAM TX Settings"

	CAM 1	CAM 2	CAM 3	CAM 4
IP TX1	◉	○	○	○
IP TX2	○	◉	○	○
IP TX3	○	○	◉	○
IP TX4	○	○	○	◉

You can re-route the respective output signal from a CAM module to an IP output by clicking on the corresponding radio button. In the example at the left, the signal from CAM module 1 is re-routed to IP output 1. Furthermore, the signal from CAM module 1 is re-routed to IP output 2, etc.

IP RX1	IP RX2	IP RX3	IP RX4
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○

In addition, you can also loop the IP input signals directly through to the IP outputs by activating the corresponding radio button.

If an input signal has not become available, you can also re-route the signal from the test generator (see section "Test generator") to the respective IP outputs.

The respective transport stream ID, the network ID and the alias for every source is displayed in the upper part of the table.

Submit | Reset Form

Click on the "Submit" button below the table to save your changes.
Click on "Reset Form" to restore the original settings.

NOTE: You will find an example of configuration in the section "Quick start – starting operation of the U 194".

"CAM" menu

This section describes how you can enter decryption settings for the four CAM modules.
The procedure is described in the following.

To display the input mask for module configuration, click on the items "CAM1", "CAM2", "CAM3" and "CAM4" respectively in the menu at the left.

CAM module information

The respective name of the module and its current status appear in the upper table. When the module is functioning properly, the message "running" is shown. If no CAM module is installed, then the message reads "no CAM installed". Other error messages are "CAM error temperature too high" and "voltage error".

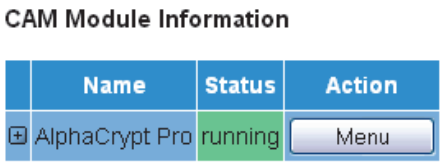


Figure 37: CAM module information

Click on the "+" symbol in the left-hand column to have an overview of the CAM systems displayed.
If you press the "Menu" button in the right-hand column, the MM menu of the module is opened.

Entering decryption settings

You can add the services for decryption using the second table and – when required – limit the decryption to individual elements.

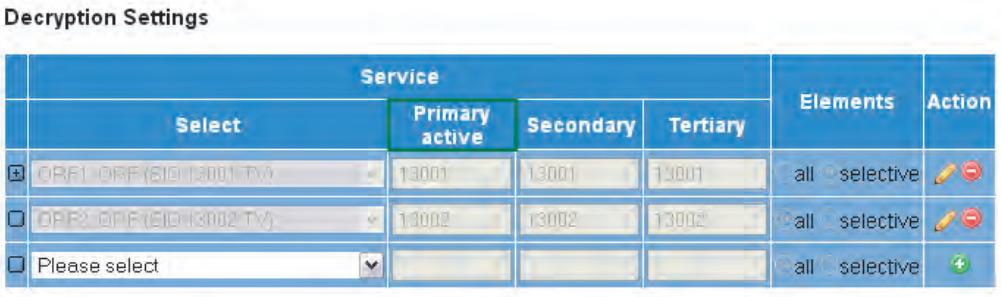
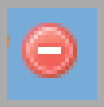


Figure 38: Selecting services for decryption

To add a service, start by selecting the service in the "Select" column or enter the SIDs in the input fields manually. Click on the "+" symbol in the right-hand column. The service will now be added.
You can set different SIDs for the redundant reception sources.
Details on the redundancy concept can be found in the section "Menu IP RX".
Depending on the source which is active, either Primary, Secondary Tertiary will be marked as active.
.



NOTE: If you wish to delete a service from the list, click on the red symbol in the right-hand column.

If you wish to select individual elementary streams, click on the pencil symbol to activate the service.

You can select whether the full service ("all") or only individual elements ("selective") should be decrypted in the "Elements" column. To do so, click on the corresponding radio button. If you select the option "selective", another table opens in which you can select the individual elementary streams.

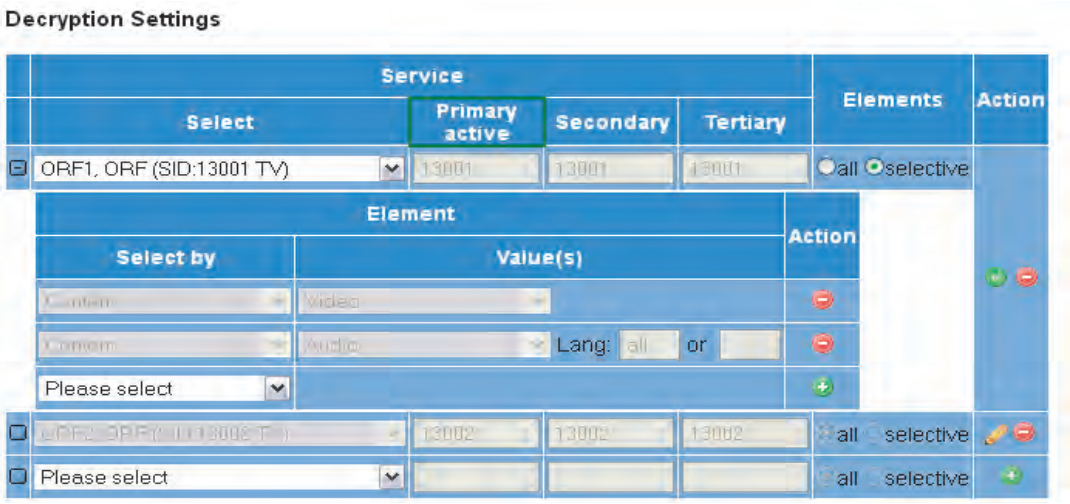


Figure 39: Selecting service elements selectively

You can choose between the options "PID", "Content" and "Stream Type" in the "Select by" column.
.

The option "**PID**" allows a selection to be made according to the elementary stream PID. Enter the required PID in the respective input field manually (for the fields "Secondary" and "Tertiary", see the section "Menu RP RX").

The option "**Content**" allows a selection to be made according to the content of the elementary streams. A drop-down menu appears in the "Value(s)" column with the following options:

- `Video:` All video elementary streams are decrypted.
- `Audio:` All audio elementary streams are decrypted.
- `Teletext:` The elementary streams for all languages are decrypted.
- `Subtitling:` When you select this option, the elementary streams for subtitles are decrypted.

To the right of the drop-down menu, two input fields for language selection appear, which allow you to enter the preferred language or an alternative language, as an abbreviation.

The option "**Stream Type**" allows you to select the elementary stream according to the DVB stream type.

Your changes will be applied as soon as you click the Plus button or the Tick button.
Click on "Reset Form" to restore the original settings.

Status display

An overview of the decryption status appears in the third table (see figure 32, below). The left-hand column shows the respective SID, the middle column shows the selected service and the right-hand column shows the current status of the decrypted PIDs.
If a service is not being decrypted, then "no processing" is displayed.

Status

	SID	Service	Status
⊞	**13001**	**ORF1, ORF**	descrambling 4 PIDs (4 of 6 PIDs selected)
⊞	**13002**	**ORF2, ORF**	descrambling 3 PIDs (5 of 5 PIDs selected)
⊞	**13003**	**ORF2 W, ORF**	no processing
⊞	**13004**	**ORF2 N, ORF**	no processing
⊞	**13005**	**ORF2 B, ORF**	no processing
⊞	**13006**	**ORF2 O, ORF**	no processing
⊞	**13007**	**ORF2 S, ORF**	no processing
⊞	**13008**	**ORF2 T, ORF**	no processing
⊞	**13009**	**ORF2 V, ORF**	no processing
⊞	**13010**	**ORF2 St, ORF**	no processing
⊞	**13011**	**ORF2 K, ORF**	no processing
⊞	**13012**	**ATV, ATV+**	no processing
⊞	13013	HITRADIO OE3, ORF	no processing
⊞	13014	ORF2E, ORF	no processing
⊞	13019	RiC, -	no processing
⊞	13200	AlphaCrypt, ORF	no processing
⊞	13221	Crenova OTA Service, ORS	no processing

Figure 40: Status display of the decryption

Services marked in bold type include at least one encrypted service.
Click on the "+" symbol in the left-hand column to have the detailed settings for decryption displayed.

Status

	SID	Service					Status
⊟	13001	ORF1, ORF					descrambling 4 PIDs (4 of 6 PIDs selected)
	PID	Type	Content	Language	Input	Output	Status
	160	0x02	ISO/IEC 13818-2 Video		**scrambled**	free	descrambling
	161	0x03	ISO/IEC 11172 Audio	ger	**scrambled**	free	descrambling
	162	0x03	ISO/IEC 11172 Audio	eng	**scrambled**	free	descrambling
	163	0x06	ISO/IEC 13818-1 Private PES data packets	ger	**scrambled**	free	descrambling
	165	0x06	ISO/IEC 13818-1 Private PES data packets (Teletext)	ger	free	free	no processing
	169	0x06	ISO/IEC 13818-1 Private PES data packets		free	free	no processing

Figure 41: Status display details

The extended view shows all settings made in the "Decryption Settings" table (encrypted PIDs, type, selected content, language). It also shows whether the content is encrypted or not encrypted ("scrambled" or "free").
The "Output" column shows you whether the content of the output signal is unencrypted for the respective PID. The "Status" column shows whether the PIC is being decrypted ("descrambling" or "no processing") or whether errors have occurred.

„SSL Settings“ menu

NOTE: For using the SSL functionality a license is needed!

To adjust the SSL settings, click on „SSL Settiings“ in the main menu.

The first table „SSL Settings“ shows a checkbox, that indicates a redirection of HTTP requests to the secure HTTPS version. After inserting the license the checkbox will be activated.

Setting	Value
Redirect HTTP requests to HTTPS	☐

Bild 42: „SSL Settings“

The next table „Generate a CSR for this device“ offers configuration of individual information concerning the device („Certifivate 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	Download CSR

Bild 43: „Generate a CSR for this device“

By clicking on the „Download CSR“ button you can generate a „Certificate Signing Request“, by which your CA can issue a certificate for the device. The input filed „Private key use“ shows if the key of the device or the deposited key is used.

Belw you will find another table „Key and Certificate Settings“.:

Key and certificate settings

Upload device key in PEM format	Durchsuchen... Keine Datei ausgewählt.	Upload key
Clear supplied key	Clear key	
Upload device certificate in PEM format	Durchsuchen... Keine Datei ausgewählt.	Upload certificate
Clear supplied certificate	Clear certificate	
Regenerate device key and certificate	Regenerate	

Submit Reset Form

Bild 44: „Key and Certificate Settings“

“

Here you can:

- ☐ upload a device key (click on the button „search“ and select the desired file; then click on „Upload key“)
- ☐ remove an existing device key (click on „Clear key“)
- ☐ upload a device certificate (click on „search“ and select the desired file; then click on „Upload certificate“)
- ☐ remove an existing device certificate (click on „Clear key“)
- ☐ regenerate device key and device certificate (click on „Regenerate“)

Submit Reset Form

After changing the settings in one of the tables, click on „Submit“ below the last table to store the new parameters or click on „Reset Form“ to delete the values entered before.

The device manages two pairs of keys/certificates: „generated“ and „user“. The figure below shows, which key and certificate is being used.

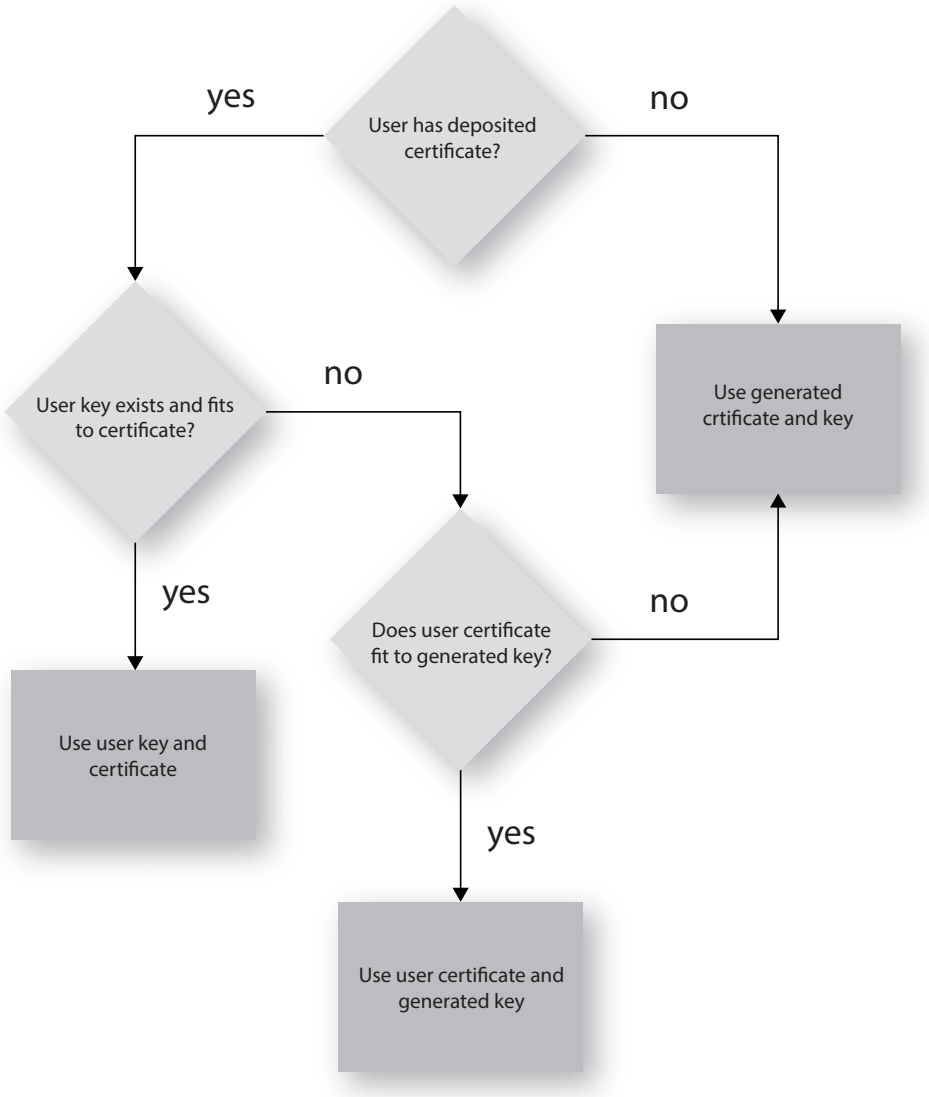


Bild 45: Use of certificates / keysl

"User settings" menu

Click on the item "User Administration" in the menu at the left to have the corresponding input mask displayed. You will now see the input mask shown in figure 46.

Property	Username	New Password	Retype New Password	Delete
Admin account	admin			
User account 1	user			☐
User account 2	controller			☐
User account 3				☐
Timeout	5 minutes			
Name	ASTRO EdgeDecrpt U194			
Location	Headend in Cablecity			
Contact	John Doe, admin@example.com			

Figure 46: User administration

You can create up to four users for the user interface of the U 194. In its default state, the device features the following three users:

- user
- admin
- controller

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`. Enter the preferred password in the input field `New Password` and confirm it by typing it in the input field `Retype new Password` again.

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

To delete a user account, tick the corresponding check box `Delete` in the right-hand column of the table.

You can also enter the following settings:

- `Timeout:` You can enter a time span, in minutes, for the automatic log out in this input field. Should no more entries be made in the user interface, an automatic log out will occur once the time specified here has elapsed.
  The time remaining until the automatic log out is displayed under the main menu, in the left-hand column of the user interface.
- `Name, Location, Contact:` You can store a name for the system, its location and the contact data for a person in these input fields. These are displayed in the status row.

Submit Reset Form

IMPORTANT: All changes are only applied once you have clicked the "Submit" button under the input mask! Click on the "Reset form" button to delete the values entered again.

The table below shows the RADIUS Administration. Here you can declare a RADIUS server Please note that for using the RADIUS functionality a license is needed.

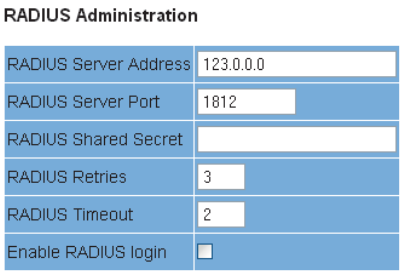


Bild 38: RADIUS Administration

You can type in the folllowing information:

- RADIUS Server Address
- RADIUS Server Port
- RADIUS Shared Secret
- RADIUS Server Retries
- RADIUS Server Timeout
- Enable RADIUS Login

NOTE: Users that are configurated on the device will be deactivated when a RADIUS server is configurated!
The RADIUS server must be configurated. Users with service type „Administrative" are administrators of the device.
When the checkbox „Enable Radius Login" is clicked, the RADIUS function is activated, if the RADIUS Server is accessible. If this is not the case,, the RADIUS function remains inactive and the following message appears: „RADIUS logins have not been enabled because the connection check failed".

Below there's a third table in which you can create a whitelist for incoming IP data. Only IP data coming from a source declared in teh whitelist will be processed.

	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

Bild 39: Whitelist Administration

The parameters you can declare for the four IP sources are:

- IP Address
- Netmask

"TS analyzer" menu

The U 194 descrambler 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. Clicking on the "TS Analyzer" submenu allows you to select the transport stream for analysis. You will then see the following input mask:

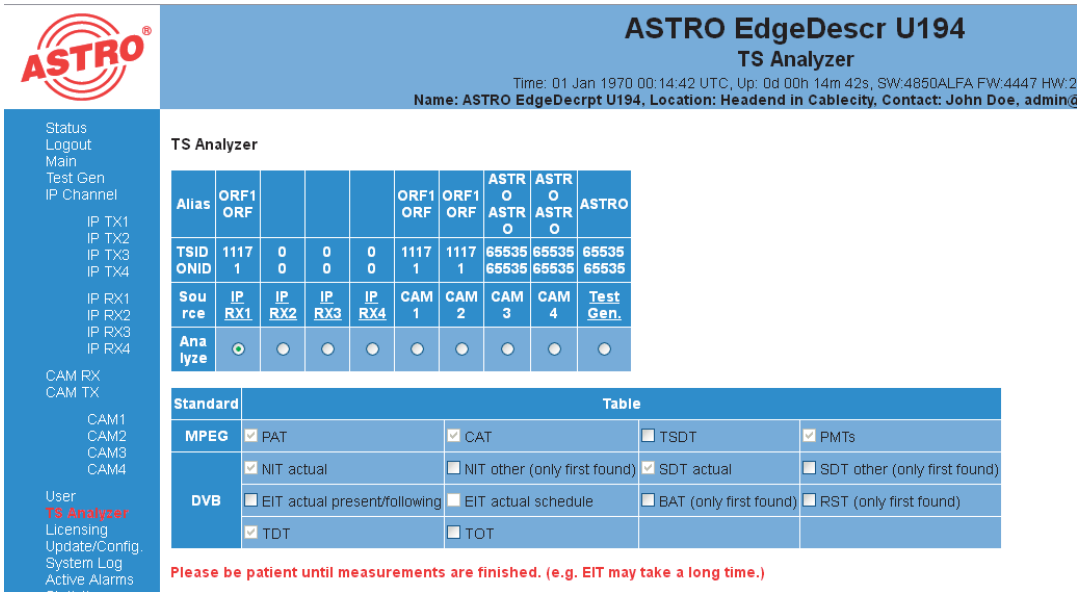


Figure 47: Transport stream analyzer

To analyse a transport stream, click on the corresponding button in the "Analyze" row and then click on the "Submit" button. If you wish to reset your input, click on the "Reset" button.

NOTE: The two "Submit" and "Reset" buttons are only visible when this module has been licensed. If this is not the case, you will see the link "No license" instead. Click on this or on the "Licensing" item in the menu at the left to access the "Licensing" input mask (more details can be found in the section "Licensing").

"Licensing" menu

You will only be able to use a number of functions featured by the U 194 (e.g. the TS Analyzer) once you have activated them using a licence key.

The licence key with the respective function can be purchased from ASTRO. You will then receive a licence key which allows you to activate the functions using the web browser interface.
The format of a 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. You will now see the following input mask:

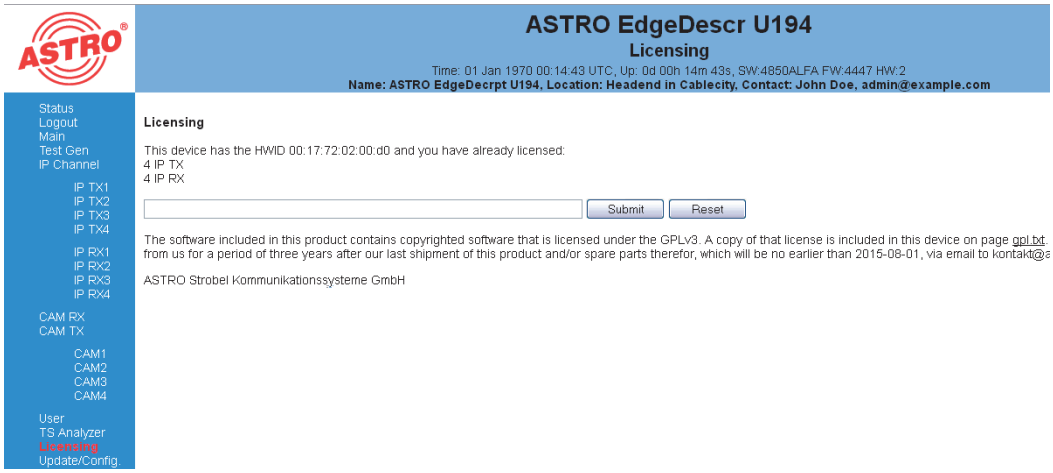


Figure 48: Using the licence key to activate licences

Now enter the licence key sent to you in the input field. You can enter the key in the input mask using "Copy / Paste". Then click on the "Submit" button to copy the text to the device. If the licence is valid, this will be confirmed by the message "License is valid". An error message appears when the licence is invalid.

To order additional licences, you must enter the MAC address of the device.
You will find the MAC address in the "Licensing" submenu (HWID) on the web browser interface. After the MAC address has been entered, the licence keys are generated at the ASTRO company and sent by e-mail or on a CD.

"Update/config." menu

You can carry out an update of the firmware version used by your device under the menu item "Update/Config." and upload or download a variety of configuration files.

Firmware update from a local memory

You will require an update archive to update the firmware. This can be downloaded from the ASTRO firmware server (address: "http://astro-firmware.de/Headend-Firmware/u1xx"). The file name of the required archive features the ending ".up". The name is comprised of the type designation of the device (U 194) and a four-digit version number.
Once you have downloaded the update archive, start by selecting the entry "Update/Config." in the user interface menu. You will then see the "Software Update" table at the top of the content area.

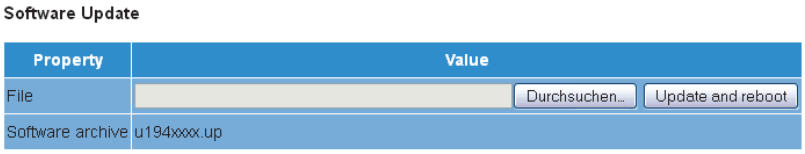


Figure 49: Firmware update

Now click on the "Search" button and select the path to the memory where the update archive downloaded earlier is stored.
Then click on the "Update and reboot" button to start the update process. Please wait until the process is complete, and the device has rebooted.

Uploading and downloading configuration files

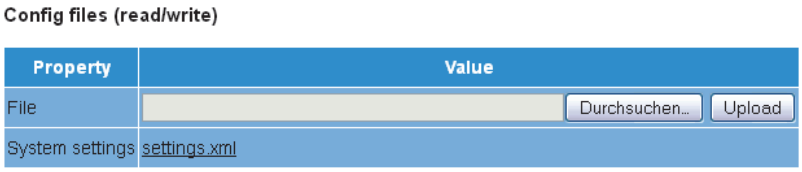


Figure 50: Loading / saving configuration files

You can both upload and download configuration files.
Use the "Search" button to select the file you wish to upload.
Then click on the "Upload" button to start the upload.

The following files are available for downloading:

- `System settings` (XML format)

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

Downloading configuration/status files

Config/status files (read only)

Property	Value
Module info	module.xml
IP configuration	ip.xml
System status	status.xml
System measurements	measure.xml

Figure 51: Loading status files

The following files are available for downloading:

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

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

Loading/saving firmware and the configuration using T(FTP)

The "Firmware update and configuration via server" table allows you to carry out a firmware update using (T)FTP servers, and to load or save configuration files.

Firmware update and configuration via server

Property	Value
(T)FTP Server address	astro-firmware.de
Protocol	FTP TFTP
FTP Username (e.g. anonymous)	anonymous
FTP Password (e.g. guest)	•••••
Path	/Headend-Firmware/u1xx/
Version	
Mode	Please select

Figure 52: Loading/saving firmware updates and configuration files using T(FTP)

To carry out the required action, start by selecting an action from the drop-down menu in the "Mode" row. The action can only be carried out when the specified server path actually exists. Furthermore, any firewalls set up must be configured to allow T(FTP) communication.

The following individual actions are available for selection:

- Action "**Load config from server**": A configuration stored on the T(FTP) server is transmitted to the U 194 and activated with immediate effect. The IP settings for the data and management interfaces on the device remain unchanged. The file "settings.xml" is written in the U 194.
- Action "**Save config to server**": The current configuration of the U 194 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)
- Action "**Update firmware from server**": When you select this action, you must specify the required software version under `Version` (4 digit maximum). After a successful update, the message "Firmware update OK. Please reboot to use the new firmware version" appears.
- Action "**Load firmware from server**": When you select this action, you must specify the required software version under `Version` (4-digit maximum). The software selected is written onto the SD memory card, but is not unpacked.
- Action "**Unpack *.up archive**": When you select this action, the update archive is unpacked and stored on the SD memory card (specify version number).
- Action "**Update firmware from SD card**": When you select this action, the update archive is unpacked, saved to an SD memory card and programmed into the module (specify version number).
- Action "**Overwrite backup firmware**": The device software is saved in two areas. The software saved in the first area is used for operating the module, while the second area is used to store a back-up copy for the event that the update process fails. As long as the two areas differ, the information "Backup differs" will be displayed in the "Active Alarm Table" menu. The current software is saved to the back-up area by this action.

Once you have selected an action, you can add any information still missing from the remaining rows in 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 simpler TFTP protocol.
- `FTP Username:` This depends on the settings made in the FTP server used (e.g. "anonymous" for astro-firmware.de).
- `FTP Password:` This depends on the settings made in the FTP server used (e.g. "astro" for astro-firmware.de).
- `Path:` Path to the location where data is stored or from where data can be loaded. The path must be specified in relation to the root directory of the FTP server and must always begin with "/" and also end in "/" (enter the slash without the quotation marks).
- `Version:` Enter the software version number here which you wish to download or save.

NOTE: If the update is carried out via the TFTP protocol, then filling in the input fields "FTP Username" and "FTP Password" is not required.

"System log" menu

To have the system log book displayed, click on "System Log" in the menu at the left. You will now see the following overview:

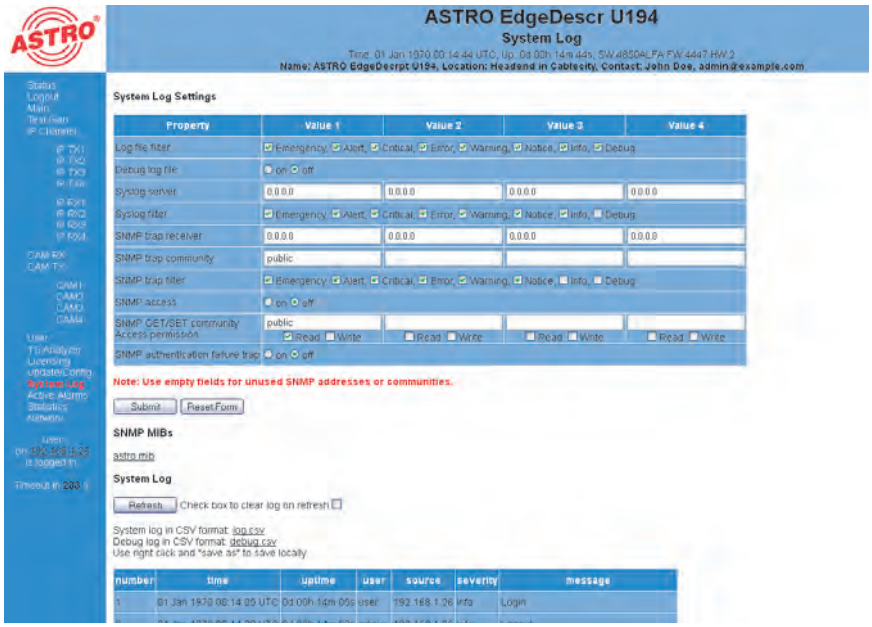


Figure 53: Logbook

You can check, or set, the following parameters individually:

System log settings

System Log Settings

Property	Value 1	Value 2	Value 3	Value 4
Log file filter	☑ Emergency, ☑ Alert, ☑ Critical, ☑ Error, ☑ Warning, ☑ Notice, ☑ Info, ☑ Debug			
Debug log file	○ on ◉ off			
Syslog server	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 trap receiver	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 access	○ on ◉ off			
SNMP GET/SET community Access permission	public ☑ Read ☐ Write	☐ Read ☐ Write	☐ Read ☐ Write	☐ Read ☐ Write
SNMP authentication failure trap	○ on ◉ off			

Figure 54: Filter settings for the log book display

You can activate, or deactivate, filters for displaying the log book entries here. To have messages in a corresponding category displayed, activate the check box allocated to the category.

NOTE: You can connect to the 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 using the download link below the "System Log Settings" table.

Logbook

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	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 55: Log files

Click on the "Refresh" button to update the log book display. The entries in the log book are sorted chronologically according to the time when the event occurred.
If you do not wish the existing entries to be displayed after refreshing the log book, tick the "Check box to clear log on refresh" check box. When the check box is ticked, then following a refresh, the first entry listed will be the deletion of the old log book entries (the user account and the current time upon deletion are specified).

You can also download the following log files:

- ☐ `Log book` (CSV format)
- ☐ `Debug log book` (CSV format)

"Active alarms" menu

To have the "Active Alarm Table" displayed, click on the corresponding item in the menu at the left. You will then see the following table:

Active Alarm Table

Device	Ident	Code	Type	Message	Severity	Count	Status	Username	User IP	TSID	SID	Alias
	0x0b00001c	0x0b00001c	1	Backup firmware differs!	4	1	4	system	local	-1	-1	
	0x01000006	0x01000006	1	Fan fail (0)	2	2	2	system	local	-1	-1	
	0x0b00004b	0x0b00004b	1	Time is not synced	4	3	2	system	local	-1	-1	

Figure 56: Active Alarm Table

The table provides information about any error messages currently active. The "Message" column displays the error message in plain text.

NOTE: *You can also access the "Active Alarm Table" menu by clicking the red dot in the status row in the upper part of the user interface.*

"Statistics" menu

To retrieve the data transfer statistics for the U 194, click on the item "Statistics" in the menu at the left. All the statistics relevant to the operation of the device and its analysis are displayed here. The following, individual tables are displayed:

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	0.8 Mbit/s	0.0 Mbit/s	76.6 Mbit/s	76.6 Mbit/s
Receive	0.1 Mbit/s	0.0 Mbit/s	71.0 Mbit/s	70.9 Mbit/s

Figure 57: Ethernet bandwidth

For the Management A, Management B, Data A and Data B interfaces, the respective transmission rates for transmission (transmit) and reception (receive) are shown.

Ethernet frames

Property	Data A (eth2) 1G	Data B (eth3) 1G
Total frames sent by host	19	19
Total frames sent to host	284	272
Total exception frames sent to host	87	0
Total errored frames received	0	0
Total frames discarded by deencapsulator	108776	130563
Total frames discarded because of lack of buffers	0	0
Total transmit frames generated from IP TX 1 / per sec.	2792023 / 3214	2792023 / 3214
Total transmit frames generated from IP TX 2 / per sec.	3071235 / 3535	3071235 / 3535
Total transmit frames generated from IP TX 3 / per sec.	91130 / 103	91130 / 103
Total transmit frames generated from IP TX 4 / per sec.	91130 / 103	91130 / 103
Total receive frames forwarded to IP RX 1 / per sec.	2814153 / 3214 2814152 / 3214 0 / 0	2814150 / 3214 2814149 / 3214 0 / 0

Figure 58: Ethernet frames

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

- The total number of IP frames transmitted to the processor is specified in the first three rows
- Number of 'errored' frames
- Number of frames which could not be assigned
- Number of frames which could not be assigned due to exceeding the maximum buffer size
- Rows 7 to 10 show the total number of frames transmitted per transport stream for every IP transmitter, and per second, respectively.
- The last row shows the number of frames (primary, secondary and tertiary respectively) re-routed to the IP receiver.

Ethernet TX

Property	Value
Minimum FEC Freelist	220
Maximum output queue depth	255

Figure 59: Ethernet TX

In terms of the forward error correction, the lowest number of free FEC buffers measured at all is displayed in the first row.
The second row shows the total number of FEC buffers.

Ethernet RX

Channel	Encap	TS Rate	Buffer depth	FEC	Valid	Missing	Fixed	Duplicate	Reordered	Out of range
IP RX1	1328 bytes 7 packets RTP/UDP/IP	33.8 Mbit/s Mult. PCR	0 Frames 0.0 % 0.0 ms	none	2744031	0	0	0	0	0

Refresh Check box to clear statistics on refresh ☐

Figure 60: Ethernet TX

The following parameters are displayed for the individual IP receivers:

- `Encap:` The number of bytes for the IP payload per frame is shown in the upper row; below it, the number of TS packets per frame is shown. The lower row specifies whether the transmission uses UDP / IP or TRP / UDP / IP. The transmission protocol is selected using the menu item "IP RX" in the table row "Encapsulation".
- `TS Rate:` The net data rate is specified in the upper row; the lower row shows whether the transport stream has one, or multiple, PCRs. This setting can be made using the menu item "IP RX" in the "Bitrate" row of the "Channel Settings" table.
- `Buffer depth:` The absolute buffer size (number of frames) is displayed in the upper row; the relative buffer size (in %) appears below it. The third row shows the buffer size in relation to the transport stream rate.
- `FEC:` If the data stream is an RTP data stream, the FEC configuration identified is displayed here. Prerequisite for this is that FEC has been activated in the "IP RX" menu (radio button "ON").
- `Valid:` Total number of valid IP frames
- `Missing:` Total number of IP frames not received (this is only measured when RTP is used)
- `Fixed:` When forward error correction (FEC) is activated, any missing or defective frames can be restored. The number of restored frames is displayed.
- `Duplicate:` Number of IP frames received multiple times (this is only displayed when RTP is used)
- `Reordered:` Number of IP frames arriving in the wrong order, but which can be swapped back into place due to a sufficient buffer size (this is only displayed when RTP is used)
- `Out of range:` Number of IP frames arriving in the wrong order and which cannot be swapped back into place due to an insufficient buffer size.

"Network" menu

To have the network settings displayed, click on "Network" in the menu at the left. You will now see the following overview:

Figure 61: Network settings

The properties of the interface statistics displayed in detail are purely for information purposes, and are used to describe the network. In the event of a fault, they may be useful for customer service.

"Devices" menu

To have an overview of the local data memory in the device displayed, click on the item "Devices" in the menu at the left. Among other things, the total memory capacity, the size of the available memory and the saved files are displayed:

Block device: /

```
total size:   63024 blocks,   516292608 bytes
free size:    57138 blocks,   468074496 bytes
block size:    8192 bytes

   CHLISTBE.XML [mode 00000008 ino 00000002 nlink 1 size 13955]
   CHLISTDE.XML [mode 00000008 ino 00000004 nlink 1 size 13969]
   CHLISTFR.XML [mode 00000008 ino 00000006 nlink 1 size 13967]
   CHLISTRU.XML [mode 00000008 ino 00000008 nlink 1 size 13920]
   CHLISTUK.XML [mode 00000008 ino 0000000a nlink 1 size 13963]
       FM_E.BIN [mode 00000008 ino 00000054 nlink 1 size 359948]
       FM_S.BIN [mode 00000008 ino 0000007d nlink 1 size 955870]
     MPEG4.BIN [mode 00000008 ino 000002a3 nlink 1 size 1561616]
  U1144172.UP [mode 00000008 ino 000003b4 nlink 1 size 4751364]
  U1154172.UP [mode 00000008 ino 000005fa nlink 1 size 4679684]
  U1244172.UP [mode 00000008 ino 00000837 nlink 1 size 3768324]
     MAN_E.BIN [mode 00000008 ino 00000c91 nlink 1 size 1802492]
        IP.XML [mode 00000008 ino 00000a05 nlink 1 size 758]
      USER.XML [mode 00000008 ino 00000a06 nlink 1 size 427]
  SETTINGS.XML [mode 00000008 ino 0000000c nlink 1 size 26117]
   MEASURE.XML [mode 00000008 ino 00000a0a nlink 1 size 2261]
    CHLIST.XML [mode 00000008 ino 00000a0b nlink 1 size 13969]
     MAN_S.BIN [mode 00000008 ino 00000d4f nlink 1 size 611296]
     DAT_S.BIN [mode 00000008 ino 00000d92 nlink 1 size 655912]
     PAL_S.BIN [mode 00000008 ino 00000de1 nlink 1 size 578295]
      MPEG.BIN [mode 00000008 ino 00000e28 nlink 1 size 1595996]
     ASTRO.MIB [mode 00000008 ino 00000eeb nlink 1 size 806]
      U114.MIB [mode 00000008 ino 00000eec nlink 1 size 25676]
    UPDATE.LOG [mode 00000008 ino 00000c72 nlink 1 size 1736]
  ANALYZER.LOG [mode 00000008 ino 00000ef0 nlink 1 size 121538]
  U114MANE.PDF [mode 00000008 ino 0000165a nlink 1 size 2561759]
  U114MANG.PDF [mode 00000008 ino 00001794 nlink 1 size 4153326]
    STILL4.JPG [mode 00000008 ino 00000a09 nlink 1 size 37970]
  020105_0.CSV [mode 00000008 ino 000014bb nlink 1 size 37762]
      U124.MIB [mode 00000008 ino 000018fa nlink 1 size 25337]
    ERROR1.JPG [mode 00000008 ino 00002bdd nlink 1 size 126919]
    ERROR2.JPG [mode 00000008 ino 00004324 nlink 1 size 72307]
    ERROR3.JPG [mode 00000008 ino 0000432d nlink 1 size 119980]
    ERROR4.JPG [mode 00000008 ino 0000433c nlink 1 size 183334]
  CHLISTUS.XML [mode 00000008 ino 00000c7a nlink 1 size 14551]
  U115MANE.PDF [mode 00000008 ino 0000481b nlink 1 size 5305763]
  U115MANG.PDF [mode 00000008 ino 00004aa3 nlink 1 size 5276753]
  U124MANE.PDF [mode 00000008 ino 00004d28 nlink 1 size 4498595]
  U124MANG.PDF [mode 00000008 ino 00004f4e nlink 1 size 4050414]
```

Figure 62: List of the local data memories (Part 1)

Block device: /conf

```
total size: 983040 blocks,     983040 bytes
free size:  859300 blocks,     859300 bytes
block size:      1 bytes

            .  [mode 016f0001 ino 00000001 nlink 1 size 0]
           ..  [mode 016f0001 ino 00000001 nlink 1 size 0]
       ip.xml [mode 016f0008 ino 00000002 nlink 1 size 758]
     user.xml [mode 016f0008 ino 00000003 nlink 1 size 427]
  measure.xml [mode 016f0008 ino 00000005 nlink 1 size 2261]
   chlist.xml [mode 016f0008 ino 00000006 nlink 1 size 13969]
 settings.xml [mode 016f0008 ino 0000002a nlink 1 size 26117]
```

Block device: /ramdisk

```
total size:    128 blocks,      65536 bytes
free size:     126 blocks,      64512 bytes
block size:    512 bytes

            .  [mode 01ff0001 ino 08564ba4 nlink 2 size 64]
           ..  [mode 01ff0001 ino 08564ba4 nlink 2 size 64]
```

Figure 63: List of the local data memories (Part 2)

Troubleshooting

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

- ☐ Check whether the bas unit has been connected to the required mains voltage (230 V~, 50 Hz for U 100-230 and 48 V for U 100-48).
- ☐ 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.

*NOTE: 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 194) and power supply units, even when the U 100 is operating.

Replacing power supply units

After removing the screws from the cover of the power supply chamber (ASTRO logo), the power supply unit can be pulled forwards by hand using the mounting tab. When installing power supply units, do not touch the fan or fan grille and only use the mounting tab affixed to the power supply unit. When the tasks are complete, the cover of the power unit chamber must be replaced. Continuous operation of the device is not permitted without this cover.

CAUTION: Do not put your hand or any objects into the power unit chamber of the U 100-230 base unit!

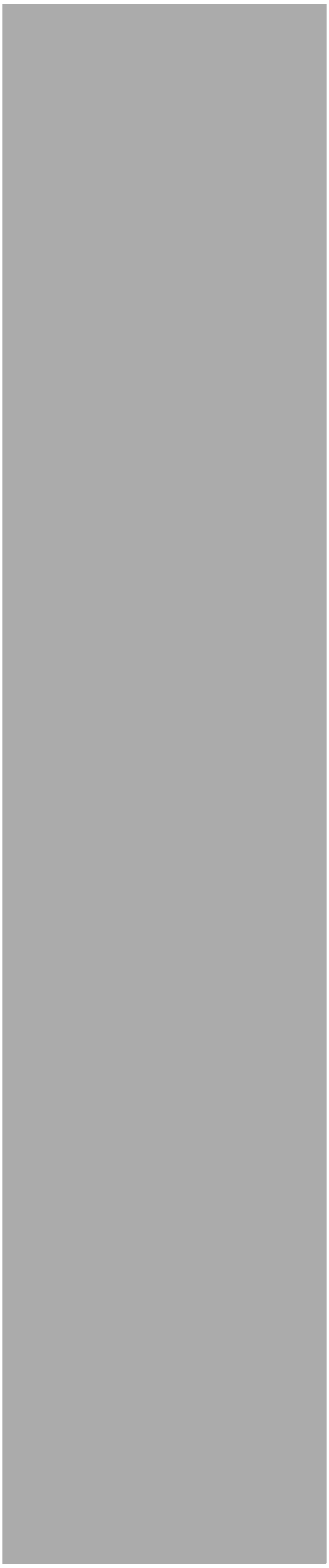
NOTE: The U 100-230 base unit must only be operated with the original power unit(s)!

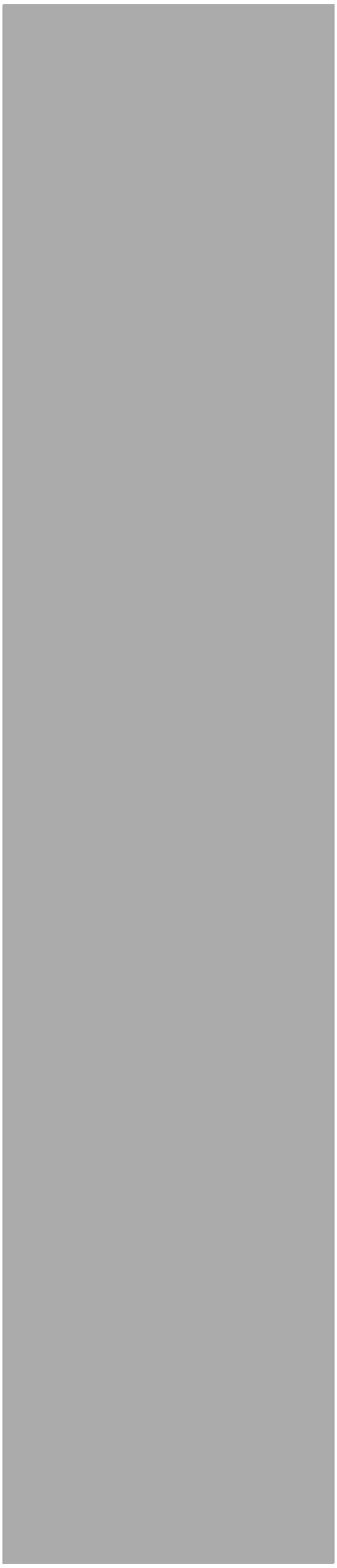
Replacing converter modules

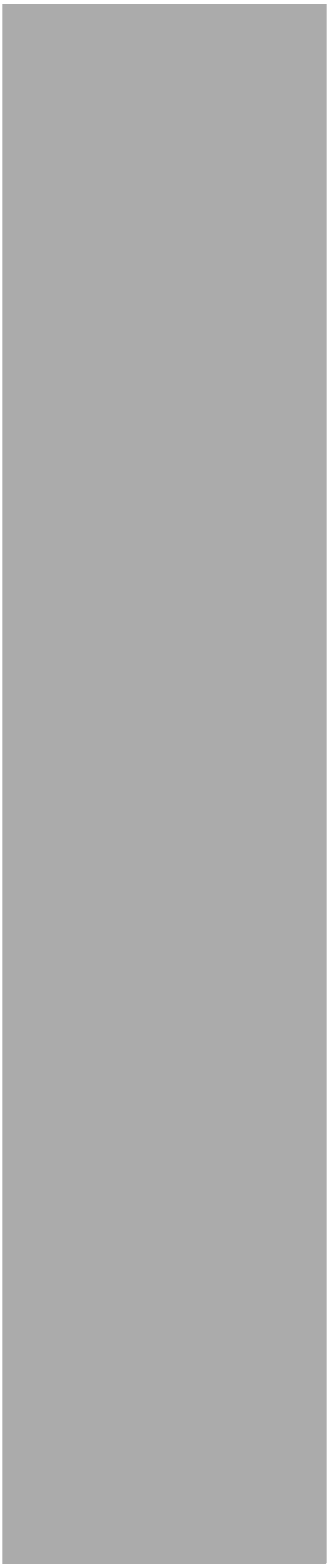
Converter modules can be pulled out to the front after removing the safety screw in the front covers (see section “Connecting and installing the module”)

Technical data

Type		U 194
Order number		380 161
EAN-Code		4026187161095
Network data interfaces		
Interface type		100FD/1000Base-T Ethernet IEEE 802.3
Prrotocol		IP v4, ARP, UDP, RTP, ICMP, IGMPv2
Connector		2 x 8p8C "RJ-45" (redundant)
TS Receiver		4 x (unicast / multicast)
TS Transmitter		4 x (unicast / multicast)
CI interfaces		
CI slots		4 x (front access)
Unterstützte Module	Auszug	Al Jazeera Sports, Alphacrypt, Aston Conax, Cryptoworks Diablo, Dragon, Dreamcrypt, Entavio CAM, Free-X TV, Giga, GkWare BISS CAM, Homecast CAM, ICECrypt, Ideto Access, Joker, Kid CAM, Magic Module, Mascom Cryptoworks, Matrix CAM, Mediaguard Canal Digitaal, Nagravision, Oasis CAM, PCMCIA CAm, PowerCam Pro, Premiere, Worldcam, T-Rex Twin Module, TechniCam Beta2, Technicrypt, TPS, Reality CAM, SMiT, Ultimate CAM, Universal CAM, Viaccess, Videoguard CAM, X-Cam, Zetacam Blue
Connectors		4 x PCMCIA
Transportstream		
TS encapsulation		UDP/IP, RTP/UDP/IP, FEC
TS type		MPTS
TS functionality		Receiver, decode, and transmit up to 4 MPTS via IP
Control and Management		
Interface type		100FD/1000Base-T Ethernet IEEE 802.3
Features		Element control via HTTP/Web-GUI, SNMP traps for integration with network management systems (NMS), software update via FTP or TFTP
Protocol		IP v4, ARP, UDP, TCP, ICMP, HTTP, SNMP v2c, FTP, TFTP, DNS, DHCP, SNTP
Connectors		2 x 8P8C "RJ-45" (redundant)
Common data		
use in U 100-48 base unit:		
Stromaufnahme bei 48 V	mA	505
Power consumption at 48 V	W	24,3 per module
Input voltage	V	- 48
use in U 100-230 base unit:		
Input voltage	VAC	100 - 240 (50 / 60 Hz)
Input power consumption	W / VA	one power supply unit, three modules: 108 / 119; two power supply units, three modules: 124 / 142
Dimensions		1 HU, 19 "
Ambient temperature	°C	0 ... +45







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