

Operating Manual



ASTRO

ASTRO EdgeCOFDM U174

Main Settings

Time: 18 Nov 2011 08:43:50 UTC, Up: 0d 16h 41m 17s, SW:4419 FW:1.8 HW:4
 Name: ASTRO EdgeCOFDM U174, Location: Headend in Cablecity, Contact: John Doe, admin@example.com

- ASTRO EdgeCOFDM U174
- MgmA 192.168.1.172
- MgmB 192.168.5.172
- admin is logged in

IP Interface Settings

Property	Management A (eth0)	Management B (eth1)	Data A (eth2)	Data B (eth3)
MAC	00:17:72:02:00:cd	00:17:72:03:00:cd	00:17:72:04:00:cd	00:17:72:05:00:cd
Active	<input type="radio"/> on <input checked="" type="radio"/> off			
Mode	1 Gbit/s, full duplex			
Address	192 168 1 172	192 168 5 172	172 24 0 172	172 25 0 172
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

Note: Please use different IP address settings for each interface.

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ASTRO EdgeCOFDM U174

RF Channels

Time: 18 Nov 2011 08:43:52 UTC, Up: 0d 16h 41m 19s, SW:4419 FW:1.8 HW:4
 Name: ASTRO EdgeCOFDM U174, Location: Headend in Cablecity, Contact: John Doe, admin@example.com

- ASTRO EdgeCOFDM U174
- MgmA 192.168.1.172
- MgmB 192.168.5.172
- admin is logged in

RF Channels

Modulator	Enable	Stream	Standard Bandwidth Constellation TS Rate	Channel Frequency	Level	Channel Filter	Reference	Status
RF1.1	<input type="radio"/> on <input checked="" type="radio"/> standby <input type="radio"/> off	IP_RX1 TSID:1093 ONID:1 Alias: Bayern 1, ARD BR	COFDM 8.00 MHz 64 QAM 31 668 Mbit/s	D706 706.000000 MHz 0.000 kHz	0.0 dB	<input type="radio"/> on <input checked="" type="radio"/> off	Set	ok
RF1.2	<input type="radio"/> on <input checked="" type="radio"/> standby <input type="radio"/> off	IP_RX2 TSID:1051 ONID:1 Alias: EinsExtra, ARD	COFDM 8.00 MHz 64 QAM 31 668 Mbit/s	D714 714.000000 MHz 0.000 kHz	0.0 dB	not fitted	Δ 0.0 dB	ok

Note: Use 0.0.0.0 for IP address and unknown DNS, or SNMP addresses.

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U174 4-way IP / COFDM converter U 100 - 230 Base unit



General

Note concerning the U 100-230 base unit:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



Caution!

Changes or modifications of the device not expressly approved by ASTRO Strobel Kommunikationssysteme GmbH or any licensed party responsible for compliance will void the user's authority to operate the equipment!

This operating manual was created to provide the instructions relevant to operating the U174. We expressly recommend reading this manual before installing or operating the device.

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. The ASTRO company is not responsible for printing errors. The contents of this operating manual are confidential and protected by copyright. This manual may not be reproduced in any form - not even in part - without prior written permission from the ASTRO company.

Pictograms and safety instructions



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



Warning about life-endangering situations due to dangerous electrical voltage or non-adherence to this manual.



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

Recycling: all of our packaging material (cardboard boxes, accompanying papers, plastic film and bags) is completely recyclable.

Used batteries must be disposed of at approved recycling points. Batteries must be completely discharged before being disposed of.



Electronic devices must not be disposed of with household waste, but rather – according to directive 2002/96/EG OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL from 27 January 2003, on waste electrical and electronic equipment – must be properly disposed of. When they are no longer of use, please bring these devices for disposal to one of the public collection points for this purpose.

Copyright notice

Some of the software of this product is third-party software, which was developed under several different licensing conditions. Detailed information concerning the licenses can be found via the Web interface of the device.

The source code of the free parts of the software is distributed on request for an administration fee.

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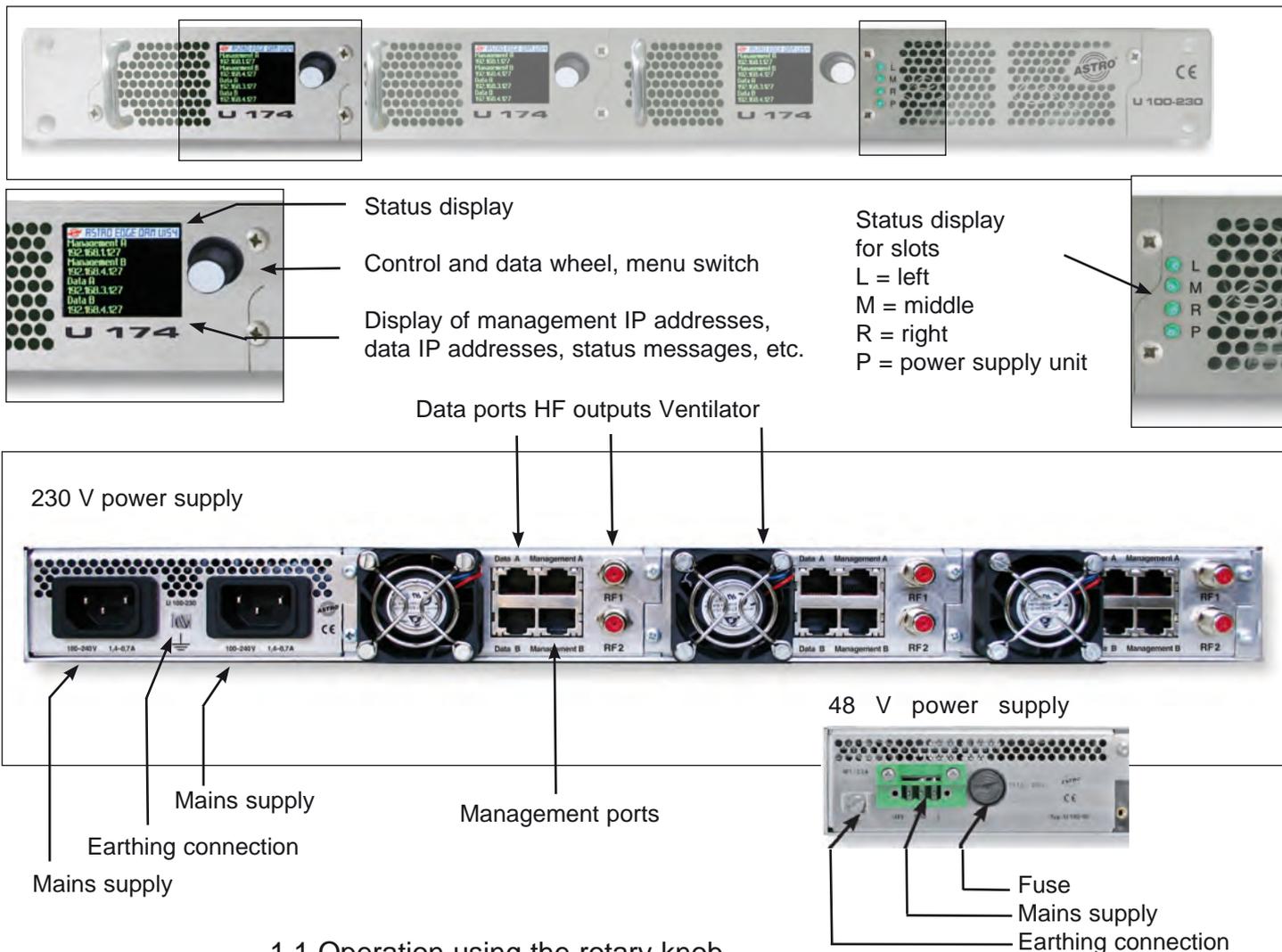
Table of contents

1	Figures	4
	
1.1	Operating the rotary knob	4
2	Introduction	5
2.1	Description of functions	5
2.2	Safety instructions	5
2.3	Mounting instructions.....	5
2.4	Potential equalisation / earthing	6
2.5	Maintenance and repair.....	6
2.6	Service tasks	6
2.7	Technical data for mains supply.....	6
2.8	Installing and coding the backplane	7
	2.8.1 Coding the backplane	7
	2.8.2 Installing the backplane	8
3	General introduction	9
3.1	Connecting the U 174 to a PC / laptop	9
3.2	The Web browser user interface	9
4	Login	10
5	Status.....	11
6	Settings for the IP interfaces, IP management and base device	12
6.1	Configuration of the IP interfaces.....	13
6.2	IP management configuration	13
6.3	U 100 settings	14
6.4	Saving and loading a configuration, default and reboot.....	14
7	Test generator	15
8	Configuration of the IP inputs	16
9	Configuration of the HF outputs	18
9.1	Overview of the HF outputs.....	18
	9.1.1 Setting the output channel.....	19
	9.1.2 Level equalisation for the output channel.....	19
	9.1.3 Operation with an output channel filter.....	20
	9.1.4 Configuration of the level detector.....	20
9.2	Detail settings for the QAM output channel.....	21
	9.2.1 Modulation settings.....	21
	9.2.2 Processing the transport stream.....	22
9.3	NIT processing	23
	9.3.1 NIT remapping.....	23
	9.3.2 Using a static NIT	23
	9.3.3 Uploading an NIT.....	23
	9.3.4 Creating a static NIT	24
10	User management	25
11	Transport Stream (TS) Analyzer.....	26
12	Licensing.....	27
13	Software update / Saving and loading a configuration.....	28
	13.1 Update using a TFTP server for Windows as an example	29
14	System log.....	31
15	Statistics	32
16	Network properties.....	33
17	Logout.....	34
18	Technical data	35



1 Figure

The figures show the U 174 installed in the U 100 - 230 base device.



1.1 Operation using the rotary knob

Once the device has been switched on, the boot process can be observed on the display. The display switches off if there is no status signal and / or input using the rotary knob for one minute.

Pressing the rotary knob switches the display on. Turning the rotary knob changes the display.

Network interface display in the front display:

- RED = switched on by SW, but no link
- GREEN = switched on by SW and 100 MBit/s link
- TURQUOISE = switched on by SW and 1000 MBit/s link
- GREY = switched off by SW

Logfile in the front display

- GREY = debug messages
- TURQUOISE = info messages
- GREEN = notice messages
- YELLOW = warning message
- RED = error message
- VIOLET = critical, alert and emergency messages

Service status display

First line: channel name / channel frequency
Second line: service name, if not "Off"

- GREY channel "Off"
- DARK GREEN: OK; but "standby"
- RED: error
- LIGHT GREEN: OK

2 Introduction

The instructions in chapter 2 mainly apply to the U 100 - 230 base device.

2.1 Description of functions

The U 100 series is used to convert IP data streams into CATV signals. The U 100-230 base device can accommodate up to three U 1xx signal converters, as well as up to two U 100-SNTs for supplying the voltage to the U 1xx signal converters. The U 174 receives up to four video data streams encapsulated according to the internet protocol (IP) and converts them into up to four standardised COFDM output signals.

2.2 Safety instructions

Disconnect both mains plugs before opening the device!

The device must not be opened - for exceptions, see the maintenance and repair, and the service tasks! Power supply units must not be opened!



The device must be connected to a power supply with an earth contact, and should be positioned close to the mains socket.

The electrical system supplying current to the device, e.g. a house installation, must incorporate safety devices against excessive current, short-circuiting and earth leakages in accordance with EN 60950-1.

Both mains plugs are used to disconnect the device from the mains, therefore they must be easy to access and use at all times. The device is already in operation when one power unit is connected to the operating voltage. When the second power unit is also put into operation, one of the power units runs in idle mode as long as the other unit is supplying power to the device. The device may only be repaired by sending it to ASTRO along with a precise description of the error.

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!

Displays indicate the status of the device operation, as well as the existence of DC voltages separate from the mains that are supplying the components of the device. However, operation displays that are not lit up in no way indicate that the device is completely disconnected from the mains or is voltage-free.



Read carefully:

EN 60 728 – Part 11, Safety requirements / No service tasks during electrical storms!

2.3 Mounting instructions

The U 100 base device may only be mounted using guide rails! If the device is only fastened by means of the screws in the front panel, this will damage the base device!

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



Protection from environmental factors:

The device must only be connected and operated in dry rooms. It must not be exposed to spraying or dripping water, or to similar phenomena. If condensation appears, wait until the device is completely dry. Objects containing liquid must not be placed on top of the device.

The permitted ambient temperature range is 0 ... 45°C (ETS 300 019-1-3 class 3.1).

Mounting environment:

The device is designed for operation in, preferably, metallically conductive 19" racks with sufficient air convection. It should be operated away from heat radiation and other heat sources. The device may only be installed in rooms in which the permitted ambient temperature can be adhered to, even under changing climatic conditions. To avoid trapped heat, it must be freely ventilated on all sides. You absolutely must avoid mounting the device in a niche or covering the ventilation openings.



2.4 Potential equalisation / earthing



The subscriber network must be earthed correctly in accordance with EN 50083-1, and must remain earthed even when the device is removed.
The potential equalisation on the U 100-230 is effected via the fastening plates of the device, or via the earthing connection on the back of the device. Devices within hand's reached must be incorporated into the potential equalisation among one another.

It is not permitted to operate the device without an earth conductor, device earthing or device potential equalisation!

2.5 Maintenance and repair



Disconnect both mains plugs before opening the device!
The device must not be opened other than for repair purposes. In general, power units must not be opened. Repairs may only be carried out at the plant or at workshops, or by persons, authorised by ASTRO Strobel Kommunikationssysteme GmbH.



Read carefully: DIN VDE 0701- 0702, Repairs

Note: The device must not be opened by the user!

2.6 Service tasks

The following tasks, in which screw connections have to be opened, can be performed by appropriately instructed service personnel: removal and installation of signal converters (e.g. U 154) and power units, also in the operating mode of the U 100-230.

Replacing power units

After the screws on the cover of the power unit chamber (ASTRO logo) are removed, the power units can be pulled out by hand, forwards along the mounting panel.
When power units are being installed, there should be no contact with the ventilator or the fan grid, and only the mounting panel attached to the power unit should be used.
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.



Note: Do not put your hand or any objects into the power unit chamber.

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

Replacing converter modules:

Converter modules can be pulled outwards after the safety screw on the front panel has been unscrewed.

2.7 Technical data for the mains supply (U 100 SNT)

Mains voltage:	100 – 240 V
Mains frequency:	50 / 60 Hz
Current consumption:	1.4 – 0.7 A per power unit
Protection class according to EN 60529:	IP 20
Permitted ambient temperature range:	0 ... 45°C
Secondary fuse in U100-230:	T3,15A L 250 V IEC 60127-2/3
Secondary fuses in U114:	SMD, various values

2.8 Installing and coding the backplane

The scope of delivery of every U 1xx signal converter includes a backplane which creates the physical connection between the signal converter and the base device. Both the mains HF connections and the network connections are connected to this backplane. The temperature controlled fan for cooling the U 1xx signal converter is installed on the backplane.

2.8.1 Coding the backplane

To determine the correct position of the backplane, and therefore the position of the respective signal converter in the U 100 base device, the jumper on the board of the backplane, which is described in the following section, must be configured.

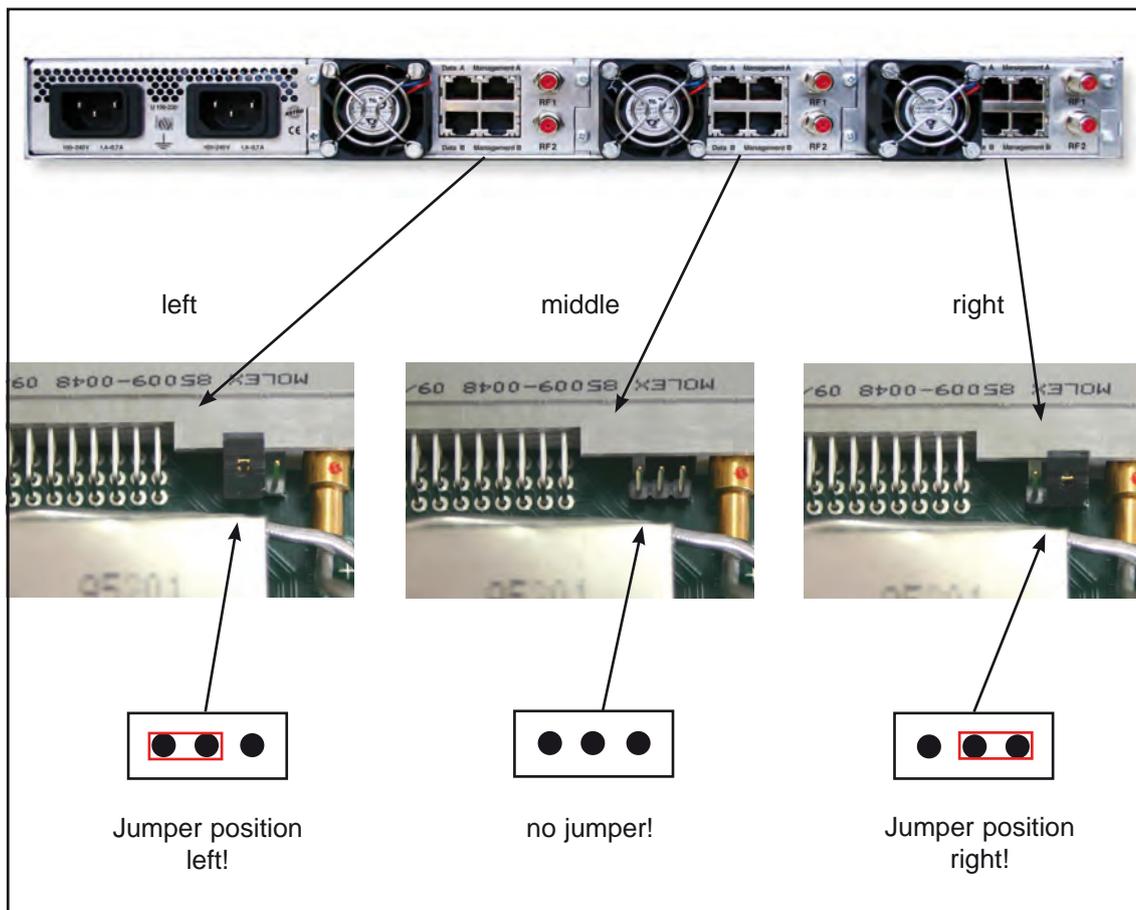


Figure 1: Coding the backplane using the jumper

Note:

An incorrectly configured jumper leads to incorrect displays in the front LEDs. In addition, the Web user interface cannot display a correct position!



2.8.2 Installing the backplane

In its state on delivery, the back of the U 100 base device is covered with blind panels:

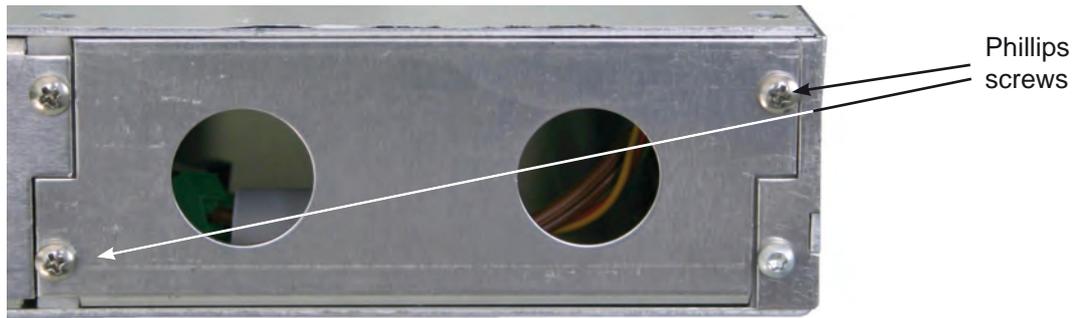


Figure 2: Position of the blind panel on delivery of U 100

To remove the blind panel, unscrew the two Phillips screws shown in the figure above and remove the blind panel. The cables which are now visible must be connected to the backplane, already coded as described in chapter 2.8.1, as shown in the following figure:

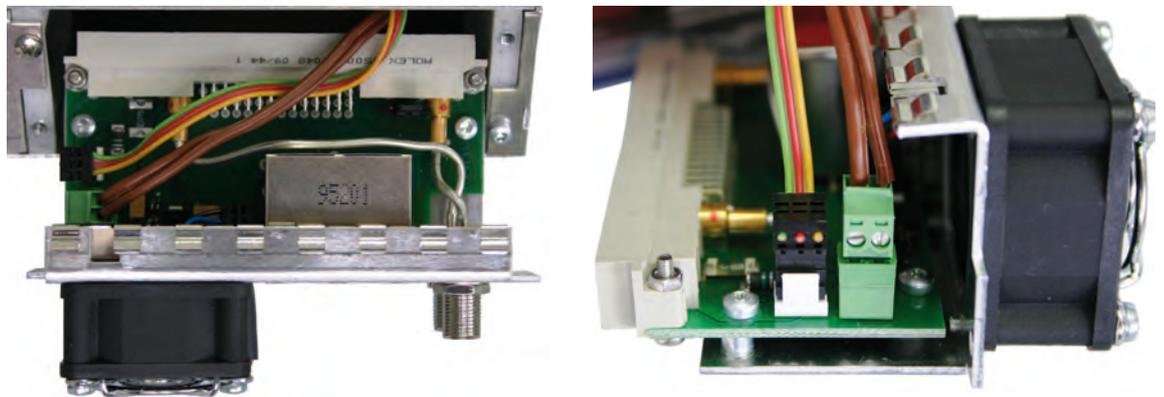


Figure 3: Connecting the voltage supply and signal lines

The backplane is now carefully inserted into the free slot of the U 100 base device and screwed in using the Phillips screws for the backplane. Here you must ensure that the cables are not clamped and that the backplane can be installed in the housing with only a small amount of pressure.

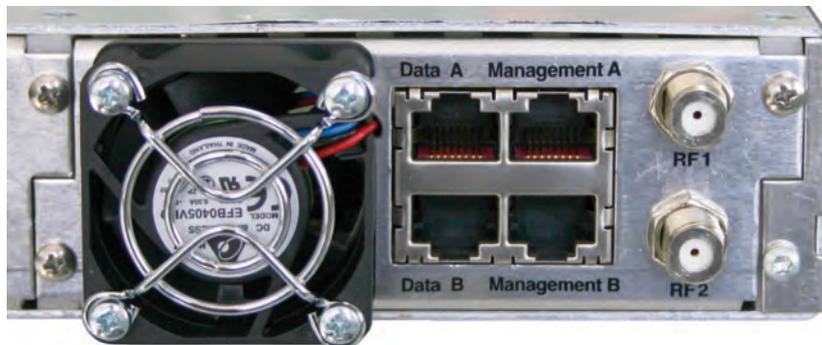


Figure 4: Correctly installed backplane

3 General introduction

3.1 Connecting the U 174 to a PC / laptop

The U 174 switches on automatically when the operating voltage is connected, or once it has been inserted into the slot of the base device. Status messages appear in the display after the boot phase (approx. 90 seconds).

If the device is connected to a PC / laptop via one of the network ports, and once the PC / laptop is appropriately configured via the network settings, you can start configuring the U 174 after you enter the IP address in the address line of the Web browser.

3.2 The Web browser user interface

The Web browser user interface is divided into the top frame, the left frame and the main frame.

The top frame shows general information about the U 174.



Figure 1: General information in the top frame of the Web browser user interface

This information is as follows:

“SW: 4491” indicates the software version of the U 174 EdgeCOFDM

“FW: 1.6” is the version of the firmware in the U 154 EdgeCOFDM

“HW: 4” is the hardware version of the U 174 EdgeCOFDM

“Up: 0d 16h 41m 1s” is the duration of the connection, measured from the moment of the login

“Time (UTC):” displays the date and time of the U 174.

The line in bold type for “name”, “location” and “contact” shows the settings described in the “User” chapter.

In the right section of the top frame, status information for the U 174 is displayed, i.e. the latest error message is visible in the Web browser user interface.

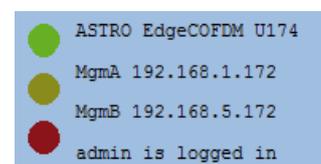


Figure 2: View of U 154 Display of the Web browser user interface

The left frame shows the navigation bar for the various submenus, which are described in detail in the following chapters.

In the main frame, the submenu is displayed according to the selection made in the navigation bar in the left frame.



4 Login

Logging in is required before configuring the U 174. This is done in the “Login” submenu.

In the state on delivery, the login data is as follows:

User: admin or user
Password: astro

After correctly entering the login data, you can proceed with the configuration.



Note:

For security reasons, the user names and passwords used in the delivery state should be changed. This prevents unauthorized access.

Only one user / BC 4 can be logged into the U 174 at a time. The user currently logged in is displayed at the very bottom of the left frame of the Web browser user interface.

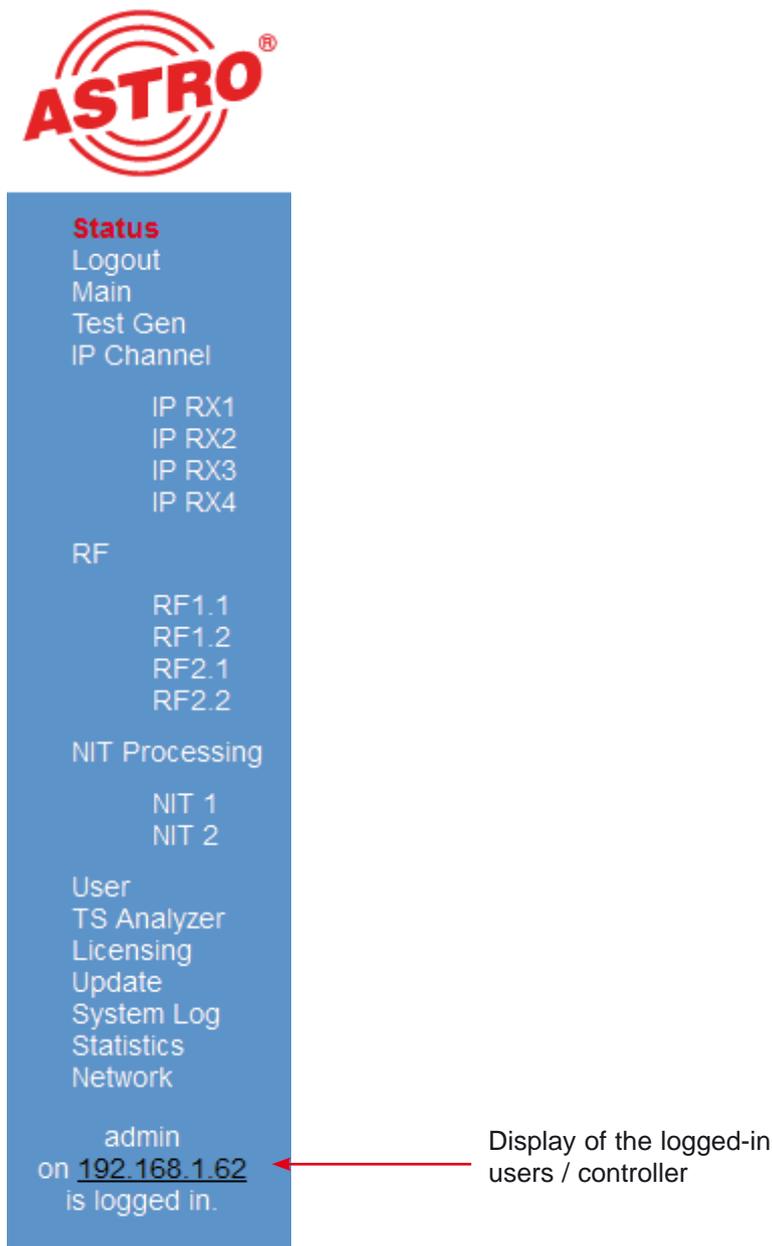


Figure 3: Display of users / controller

5 Status

When you click on the “Status” submenu in the left frame, the following window appears (example):

ASTRO EdgeCOFDM U174
Status
 Time: 18 Nov 2011 08:43:50 UTC, Up: 0d 16h 41m 17s, SW:4419 FW:1.8 HW:4
 Name: ASTRO EdgeCOFDM U174, Location: Headend in Cablecity, Contact: John Doe, admin@example.com

Ethernet

Property	Management A (eth0)	Management B (eth1)	Data A (eth2)	Data B (eth3)
MAC	00:17:72:02:00:cd	00:17:72:03:00:cd	00:17:72:04:00:cd	00:17:72:05:00:cd
Address	192.168.1.172	192.168.5.172	172.24.0.172	172.25.0.172
Subnet	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			
Transmit	0.291 Mbit/s	0.000 Mbit/s	0.000 Mbit/s	0.000 Mbit/s
Receive	0.033 Mbit/s	0.000 Mbit/s	150.695 Mbit/s	150.603 Mbit/s

IP RX Channels

Channel	Port	Prim. RX IP socket, source	Sec. RX IP socket, source	Encapsulation	FEC	TS Rate	TSID ONID	Alias
IP_RX1	B, automatic Primary	232.19.100.128:10000.0.0.0	0.0.0.0.0.0.0.0	1328 bytes 7 packets RTP/UDP/IP	none	38.100 Mbit/s Mult. PCR	1093 1	Bayern 1, ARD BR
		232.19.100.128:10000.0.0.0	0.0.0.0.0.0.0.0	1328 bytes 7 packets RTP/UDP/IP	none	33.867 Mbit/s Mult. PCR	1051 1	EinsExtra, ARD
IP_RX2	B, automatic Primary	232.19.100.129:10000.0.0.0	0.0.0.0.0.0.0.0	1328 bytes 7 packets RTP/UDP/IP	none	38.100 Mbit/s Mult. PCR	1078 1	DATA SYSTEM TR 78, MTV Networks Europe
		232.19.100.129:10000.0.0.0	0.0.0.0.0.0.0.0	1328 bytes 7 packets RTP/UDP/IP	none	33.860 Mbit/s Mult. PCR	1024 1	TELE MELODY, CSAT

RF Channels

Modulator	Stream	Standard Bandwidth Constellation TS Rate	COFDM Buffer	Channel Frequency Level	Reference	Status
RF1.1	IP_RX1 TSID:1093 ONID:1 Alias: Bayern 1, ARD BR	COFDM 8.00 MHz 64 QAM 31.668 Mbit/s	Max: 76.61 % Average: 3.85 % Stuffing: 1.513 Mbit/s	D706 706.000000 MHz 0.0 dB	Δ 0.0 dB	ok
RF1.2	IP_RX2 TSID:1051 ONID:1 Alias: EinsExtra, ARD	COFDM 8.00 MHz 64 QAM 31.668 Mbit/s	Max: 13.79 % Average: 3.72 % Stuffing: 0.438 Mbit/s	D714 714.000000 MHz 0.0 dB	Δ 0.0 dB	ok
RF2.1	IP_RX3 TSID:1078 ONID:1 Alias: DATA SYSTEM TR 78, MTV Networks Europe	COFDM 8.00 MHz 64 QAM 31.668 Mbit/s	Max: 40.52 % Average: 2.26 % Stuffing: 3.422 Mbit/s	D722 722.000000 MHz 0.0 dB	Δ 0.0 dB	ok
RF2.2	IP_RX4 TSID:1024 ONID:1 Alias: TELE MELODY, CSAT	COFDM 8.00 MHz 64 QAM 31.668 Mbit/s	Max: 23.66 % Average: 3.05 % Stuffing: 1.620 Mbit/s	D730 730.000000 MHz 0.0 dB	Δ 0.0 dB	ok

Miscellaneous

Property	Value
Temperature 1 (centre)	42.5 °C
Temperature 2 (front)	52.5 °C
Temperature 3 (rear)	54.5 °C
Temperature 4 (PA)	34.5 °C
Supply 1.2 V	1.18 V
Supply 1.5 V	1.49 V
Supply 1.8 V	1.79 V
Supply 2.5 V	2.51 V
Supply 3.3 V	3.31 V
Supply 5.5 V	5.46 V
Supply 9 V	9.06 V
Fan	9246 RPM
Power Module 1	OK
Power Module 2	OK

System memory

Property	Value
Total size of memory arena	61144472
Number of ordinary memory blocks	92
Space used by ordinary memory blocks	724120
Space free for ordinary blocks	60420332
Size of largest free block	60394372

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Figure 4: Status display in the “Status” submenu

6 Settings for the IP interfaces, IP management and base device

When you click on the “Main” submenu in the left frame, the following window appears (example):

ASTRO EdgeCOFDM U174
Main Settings
 Time: 18 Nov 2011 08:43:50 UTC, Up: 0d 16h 41m 17s, SW:4419 FW:1.8 HW:4
 Name: ASTRO EdgeCOFDM U174, Location: Headend in Cablecity, Contact: John Doe, admin@example.com

ASTRO EdgeCOFDM U174
 MgmtA: 192.168.1.172
 MgmtB: 192.168.5.172
 admin is logged in

IP Interface Settings

Property	Management A (eth0)	Management B (eth1)	Data A (eth2)	Data B (eth3)
MAC	00:17:72:02:00:cd	00:17:72:03:00:cd	00:17:72:04:00:cd	00:17:72:05:00:cd
Active	<input type="radio"/> on <input checked="" type="radio"/> off			
Mode	1 Gbit/s, full duplex			
Address	192 168 1 172	192 168 5 172	172 24 0 172	172 25 0 172
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

Note: Please use different IP address settings for each interface.

IP Management Settings

Property	Value
DNS	192 168 1 100
SNTP server	192.168.1.100 0.0.0.0
Time Source	SNTP Server

Note: Use 0.0.0.0 for unused or unknown DNS, or SNTP addresses.

U100 Rack Settings

Property	Value
Base Address	4
Slot Address	1
Power Modules	2

Submit Reset Form

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

Save 2nd Load 2nd Default Reboot

Save 2nd: All settings are saved to an alternative config.
 Load 2nd: All settings are loaded from an alternative config.
 Default: Load factory default settings.
 Reboot: Force reboot.

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Figure 5: Overall view

The settings available are described in detail in the following sections.

6.1 Configuration of the IP interfaces

You can activate and deactivate the IP interfaces in the area of the user interface displayed below. The connection type is automatically detected and displayed by the U 174. (In this case: 1 Gbit/s, full duplex for Data A and 1 Gbit/s, full duplex for Management A and B).

IP Interface Settings

Property	Management A (eth0)	Management B (eth1)	Data A (eth2)	Data B (eth3)
MAC	00:17:72:02:00:cd	00:17:72:03:00:cd	00:17:72:04:00:cd	00:17:72:05:00:cd
Active	<input checked="" type="radio"/> on <input type="radio"/> off			
Mode	1 Gbit/s, full duplex			
Address	192 . 168 . 1 . 172	192 . 168 . 5 . 172	172 . 24 . 0 . 172	172 . 25 . 0 . 172
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

Note: Please use different IP address settings for each interface.

Figure 6: IP interface configuration

Changes to the IP addresses can only be made by the admin (first user in the user administration, see chapter 10) and are applied to the U 154 using the “Submit” button. Once the IP settings have been changed, you must log in again.

Note:



When programming the IP addresses, make sure the addresses have not already been allocated in your network. Address conflicts lead to malfunctions in the network. Any network interfaces which remain unused must be deactivated. When selecting the IP addresses, make sure that interfaces in separate network segments are not within the same sub-network.

6.2 IP management configuration

The DNS server and the SNTP server are entered in the IP management configuration. When a valid entry is made under “SNTP server”, this can be used as a time reference. The MPEG flows (TDT) are additional time references.

If the U 174 signal converter is to be configured via the U 100-C controller, then the U 100-C can also be used as a SNTP server.

IP Management Settings

Property	Value
DNS	192 . 168 . 1 . 100
SNTP server	labor2.local 0.0.0.0
Time Source	SNTP Server <input type="button" value="v"/>

Note: Use 0.0.0.0 for unused or unknown DNS, or SNTP addresses.

Figure 7: IP management configuration

6.3 U 100 settings

An address can be allocated to the relevant base device under “U 100 Rack Settings”. This setting is applied to all slots in the base unit. The number of the slot currently selected is displayed below it:

U100 Rack Settings

Property	Value
Base Address	4
Slot Address	1
Power Modules	2

Submit Reset Form

Figure 8: Rack settings

6.4 Saving and loading a configuration / Default and reboot

Any changes to the configuration of the U 174 are written into the device using the “Submit” buttons, which activates and saves them immediately. To save the current configuration separately, save it to the device using the “Save 2nd” button to allow it to be used as a recovery option should settings made after “Save 2nd” be discarded. This recovery option is re-activated by pressing the “Load Second” button. How to save the configuration to a local computer or FTP server is explained in the “Update” chapter.

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

Save 2nd Load 2nd Default Reboot

Save 2nd: All settings are saved to an alternative config.
 Load 2nd: All settings are loaded from an alternative config.
 Default: Load factory default settings.
 Reboot: Force reboot.

Figure 9: Saving and loading / default and reboot

The “Default” button is used to restore the factory settings.



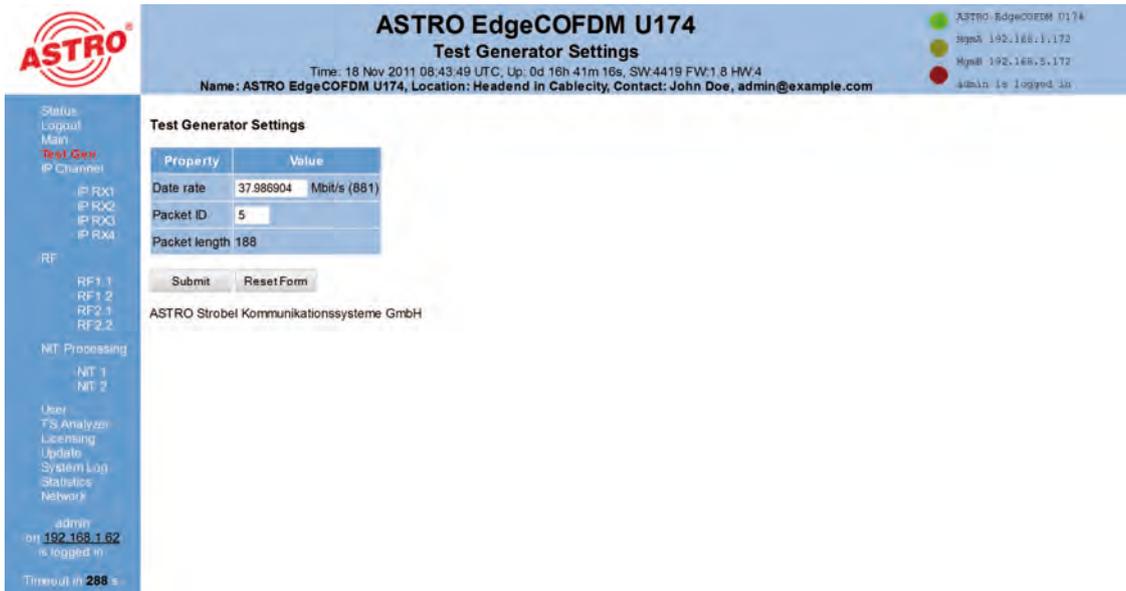
Note:

Restoring factory settings results in all the settings, apart from the user and network settings for the data and management ports, being reset to the state on delivery!

The “Reboot” button restarts the U 174 with the last settings activated.

7 Test generator

The U 174 features an integrated test generator for checking that the COFDM modulators function when there is no input signal available. The max. data rate that can be set is 67 MBit/s.



The screenshot shows the web interface for the ASTRO EdgeCOFDM U174. The main title is "ASTRO EdgeCOFDM U174 Test Generator Settings". The interface includes a navigation menu on the left with options like Status, Logout, Main, Test Gen, IP Channel, IP RX1-4, RF, RF1.1-2, RF2.1-2, NIT Processing, NT 1-2, User, TS Analyzer, Licensing, Update, System Log, Statistics, Network, and a login status for 'admin' on IP 192.168.1.62. The main content area displays the "Test Generator Settings" with a table of properties and values:

Property	Value
Date rate	37.986904 Mbit/s (881)
Packet ID	5
Packet length	188

Below the table are "Submit" and "Reset Form" buttons. The footer of the interface reads "ASTRO Strobel Kommunikationssysteme GmbH".

Figure 10: Test generator settings

If the test generator is selected as "Service" in the HF settings for a COFDM output channel, then the COFDM modulator emits a digital radio programme which is comprised of a 1 kHz tone.

8 Configuration of the IP inputs

When you click on the “IP RX” submenu in the left frame, the following window appears (example):

Figure 11: Overview of the IP input configuration

The four IP inputs for configuration are activated or deactivated here, and their current configuration is displayed. You can access the detailed settings either by clicking the respective channel (e.g. IP RX3) or clicking the corresponding submenu in the left frame.

Figure 12: Detailed IP receiver settings

To enable the greatest possible path redundancy, the U 174 has a number of different configuration options for the IP receivers. The Data A and Data B ports can be configured completely independently of one another. IGMPv3 enables the so-called “Source Select”, i.e. the IP receiver can request the data from a preferred source.

IP RX1 Channel Settings

Property	Data A (eth2) 1G					Data B (eth3) 1G						
Primary Receive IP:Port	<input type="checkbox"/> use	232	19	100	128	10000	<input type="checkbox"/> like Data A	232	19	100	128	10000
Primary Source Select	<input type="checkbox"/> use	0	0	0	0		<input checked="" type="checkbox"/> like Data A	0	0	0	0	
Secondary Receive IP:Port	<input type="checkbox"/> use	0	0	0	0	0		0	0	0	0	0
Secondary Source Select	<input type="checkbox"/> use	0	0	0	0			0	0	0	0	

Figure 13: Setting the Multicast addresses

The “use” selection box determines the data source used. This data source is defined via the Multicast address and can - if this Multicast address is provided by multiple senders - be given priority by the IP receiver. The IP address of the preferred source is entered under “Primary / Secondary Source Select”. If 0.0.0.0 is displayed here, the Source Select function is deactivated. If the same sending equipment feeds different signal paths, it may be practical to configure Data B exactly the same way as Data A. This is easily done by activating “like Data A”.

Property	Data A (eth2) + Data B (eth3)	
Enable	<input checked="" type="radio"/> on	<input type="radio"/> off
Port	B	automatic
Encapsulation	<input checked="" type="radio"/> RTP/UDP/IP	<input type="radio"/> UDP/IP
Bitrate	<input checked="" type="radio"/> Single PCR (SPTS)	<input type="radio"/> Mult. PCR (MPTS)
FEC	<input checked="" type="radio"/> on	<input type="radio"/> off
TSID / ONID	1093	1
Alias manual / automatic		Bayern 1, ARD BR

Figure 14: Settings for the IP input signal format

The IP receiver is activated or deactivated in the “Enable” line.

In the “Port” line, the data interface is selected (A or B) and the preferred data interface is set. This function enables the U 174 to switch to the second interface after an input signal has failed, and to switch back when the failed signal has been re-established (prefer A or B). If you select the “auto” option, the IP receiver remains on the substitute interface until it is manually switched back, or until this interface fails.

The protocol used in the sender is set under “Encapsulation”: RTP/UDP/IP or UDP/IP. However, the U 174 is also able to detect the protocol automatically and evaluate it accordingly.

For the “Bitrate”, you can choose between “Single PCR (SPTS)” and “Multiple PCR (MPTS)”. In this case, the U 174 can also detect the status automatically and process it.

To gain a better overview during configuration of the HF parameters, you have the option of entering an alias. If this input option is not used, the first service in the transport stream is automatically used as the alias.

9 Configuration of the HF outputs

9.1 Overview of the HF outputs

You can access the overview of the HF parameters via the “RF” submenu in the left frame.

ASTRO EdgeCOFDM U174
RF Channels
 Time: 18 Nov 2011 08:43:52 UTC, Up: 0d 16h 41m 19s, SW:4419 FW:1.8 HW:4
 Name: ASTRO EdgeCOFDM U174, Location: Headend in Cabcicity, Contact: John Doe, admin@example.com

Modulator	Enable	Stream	Standard Bandwidth Constellation TS Rate	Channel Frequency	Level	Channel Filter	Reference	Status
RF1.1	on standby off	IP_RX1 TSID:1093 ONID:1 Alias: Bayern 1, ARD BR	COFDM 8.00 MHz 64 QAM 31.668 Mbit/s	D706 706.000000 MHz 0.000 kHz	0.0 dB	not fitted	Set	ok
RF1.2	on standby off	IP_RX2 TSID:1051 ONID:1 Alias: EinsExtra, ARD	COFDM 8.00 MHz 64 QAM 31.668 Mbit/s	D714 714.000000 MHz 0.000 kHz	0.0 dB	not fitted	Δ 0.0 dB	ok
RF2.1	on standby off	IP_RX3 TSID:1078 ONID:1 Alias: DATA SYSTEM TR 78, MTV Networks Europe	COFDM 8.00 MHz 64 QAM 31.668 Mbit/s	D722 722.000000 MHz 0.000 kHz	0.0 dB	not fitted	Set	ok
RF2.2	on standby off	IP_RX4 TSID:1024 ONID:1 Alias: TELE MELODY, CSAT	COFDM 8.00 MHz 64 QAM 31.668 Mbit/s	D730 730.000000 MHz 0.000 kHz	0.0 dB	not fitted	Δ 0.0 dB	ok

RF Detector

	Mode	Level
warnings	on off	±2.5 dB
security switch off	on off	±3.0 dB

Look RF relevant settings: on
off

Submit Reset Form

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Figure 15: Overview of the HF parameters

The output channel can be activated or deactivated here. If the “Standby” option is selected in the “Enable” column, then only the HF is switched off. However, the configuration of the output signal remains active, along with the analysis of the input data stream.

The respective input data stream for conversion is selected in the “Stream” column. Opening the drop-down menu here will display all the available streams received via the IP receiver IP RX 1 to IP RX 4. The last selection option is the ASTRO test generator, which generates a digital radio channel with a 1 kHz tone in the output channel set.

ASTRO EdgeCOFDM U174
RF Channels
 Time: 18 Nov 2011 08:43:52 UTC, Up: 0d 16h 41m 19s, SW:4419 FW:1.8 HW:4
 Name: ASTRO EdgeCOFDM U174, Location: Headend in Cabcicity, Contact: John Doe, admin@example.com

Modulator	Enable	Stream	Standard Bandwidth Constellation TS Rate	Channel Frequency	Level	Channel Filter	Reference	Status
RF1.1	on standby off	IP_RX1 TSID:1093 ONID:1 IP_RX2 TSID:1051 ONID:1 EinsExtra, ARD (SID:28721 TV) Einsfestival, ARD (SID:28722 TV) EinsPlus, ARD (SID:28723 TV) arte, ARD (SID:28724 TV) Phoenix, ARD (SID:28725 TV) TestR, ARD (SID:28726 TV)	COFDM 8.00 MHz	D706 706.000000 MHz	0.0 dB	not fitted	Set	ok
RF1.2	on standby off	EinsPlus, ARD (SID:28723 TV) arte, ARD (SID:28724 TV) Phoenix, ARD (SID:28725 TV) TestR, ARD (SID:28726 TV)			0.0 dB	not fitted	Δ 0.0 dB	ok
RF2.1	on standby off	IP_RX3 TSID:1078 ONID:1 Alias: DATA SYSTEM TR 78, MTV Networks Europe DATA SYSTEM TR 78, MTV Networks Europe (SID:28670 User defined) MTV Music, MTV Networks Europe (SID:28671 TV) MTV Germany, MTV Networks Europe (SID:28673 TV) MTV PULSE, MTV Networks Europe (SID:28674 TV) MTV IDOL, MTV Networks Europe (SID:28675 TV) VIVA Germany, MTV Networks Europe (SID:28676 TV) Nick Jr France, MTV Networks Europe (SID:28677 TV) MTV NL, MTV Networks Europe (SID:28679 TV) NICK/COMEDY, MTV Networks Europe (SID:28680 TV) 28681, MTV Networks Europe (SID:28681 TV) Nicktoons (S), MTV Networks Europe (SID:28682 TV)			0.0 dB	not fitted	Set	ok
RF2.2	on standby off	IP_RX4 TSID:1024 ONID:1 Alias: TELE MELODY, CSAT			0.0 dB	not fitted	Δ 0.0 dB	ok

RF Detector

	Mode	Level
warnings	on off	±2.5 dB
security switch off	on off	±3.0 dB

Submit Reset Form

Figure 16: Drop-down menu for service selection

Further information on the output channel can be found in the “Standard Bandwidth Constellation TS Rate” column. This information covers: carrier modulation, bandwidth and maximum gross data rate.

9.1.1 Setting the output channel

The output channel is set in the “Channel Frequency” column. The channel settings can be selected from the channel list provided. If a value is selected from this list, then the input window for the channel frequency remains inactive and the corresponding channel centre frequency is displayed. If the option “manual” is selected, then you have the option of entering a channel centre frequency manually.

Note:

There may be an interval of 32 MHz between the start frequency of the RFX.1 and the end frequency of the RFX.2 within a channel pair (RF 1.1 / 1.2), e.g. RF 1.1 = S06 and RF 1.2 = S09 at a channel width of 8 MHz. If the interval set is too large, then the following error message appears:

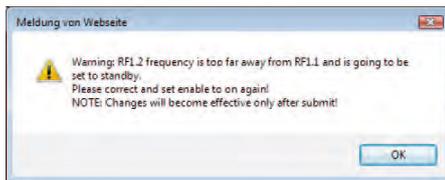


Figure 17: Error message in the event that the interval set between two channels is too large

The output channel concerned is then set to “Standby” and must be re-activated once the configuration is corrected. If an adjacent channel assignment has not been configured, then a channel filter cannot be used for the respective channel pair.

You can enter a deviation ranging between +50 and -50 kHz from the channel centre frequency in the lower input field.

9.1.2 Level equalisation for the output channel

The level of the respective output channel is equalised in the “Level” column. The relative level can be set in increments of 0.1 dB here. Changes to the level are activated by pressing the “Submit” button. If a value is entered which is inadmissibly high, the following error message appears:

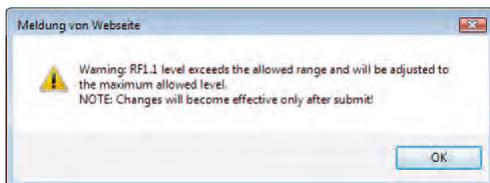


Figure 18: Warning message in the event of an inadmissible level equalisation

Once this message has been acknowledged, the maximum value is entered, which must be written into the device by pressing the “Submit” button.

9.1.3 Operation using an output channel filter

If an output channel filter (VHF...) has been plugged in the U 174, this channel filter will be detected. This will result in the option “Channel filter On / Off” being activated. If no filter is used, this option remains deactivated. If the channel filter is to be activated, the two limits which can be configured in the “Channel Filter” column must feature the same value as the output channels entered under “Channel Frequency”. Filter limits which are different to the output channel can, of course, also be used, however you will not be able to activate this filter.

9.1.4 Configuration of the level detector

The U 154 features a level detector in the output. This level detector permanently measures the output level. If the “Set” button is pressed in the “Reference” column, then the current level equalisation value will be set as the reference value and the deviation from the nominal level will be permanently measured. Depending on their size, any deviations may entail actions which require different configurations to be made. These actions can be set in the lower area, under “RF Detector”.

RF Detector

	Mode	Level
warnings	<input type="radio"/> on <input checked="" type="radio"/> off	±2.5 dB
security switch off	<input type="radio"/> on <input checked="" type="radio"/> off	+3.0 dB
Lock RF relevant settings	<input type="radio"/> on <input checked="" type="radio"/> off	

Figure 19: Configuration of the level detector

If the deviation is +/- 2.5 dB, a “warning” can be activated which is registered in the logfile and, depending on the configuration of the SNMP properties, can lead to a trap. The next level results in a security switch-off of the output channel subject to a deviation of + 3 dB. The “security switch off” must be activated for this. If the option “Lock RF relevant settings” is activated, only the service for conversion can be changed under “RF channels”. This setting blocks all other settings. Furthermore, all configuration options relevant to the HF output channel are blocked in the modulator settings (RF 1.1 to RF 2.2).

9.2 Detailed COFDM output channel settings

If you now click on the sub-menus RF 1.1, RF 1.2, RF 2.1 or RF 2.2, the following window (an example) will open:

Figure 20: Detailed output channel settings

All details for the output signal can be set on this subpage.

Input Selection

Property	Value
Defaults	COFDM (8MHz / 64 QAM) <input type="checkbox"/> Apply changes to all RF1.X channels
Parameter	Code Rate (Inner Coding) 7/8 <input type="checkbox"/> TS-Packet Stuffing <input type="checkbox"/> PRBS-Packet Stuffing
Spectrum	Carrier Constellation 64 QAM <input type="checkbox"/> 2k COFDM Mode Guard Interval 1/32 <input type="checkbox"/> 8k COFDM Mode
	Inversion <input type="checkbox"/> on <input checked="" type="checkbox"/> off

Figure 21: Service settings

The item “Input Selection” (figure 21) has the same function as the drop-down menu found in the “Stream” line of the RF main menu. The stream to be incorporated can be selected here, or the content of the respective data stream can be viewed.

9.2.1 Modulation settings

Modulation

Property	Value	Information
Defaults	COFDM (8MHz / 64 QAM) <input type="checkbox"/> Apply changes to all RF1.X channels	
Parameter	Code Rate (Inner Coding) 7/8 <input type="checkbox"/> TS-Packet Stuffing <input type="checkbox"/> PRBS-Packet Stuffing	Output TS Rate: 31.668 Mbit/s
Spectrum	Carrier Constellation 64 QAM <input type="checkbox"/> 2k COFDM Mode Guard Interval 1/32 <input type="checkbox"/> 8k COFDM Mode	Allocated Bandwidth: 8.00 MHz
	Inversion <input type="checkbox"/> on <input checked="" type="checkbox"/> off	

Figure 22: Modulation settings

The respective parameters in the “Parameter” and “Spectrum” lines will change according to the selection made under “Defaults”. If the changes should be applied to all output channels of the respective U 174, this can be done by ticking “Apply changes to all RF1.X channels” and then clicking the “Submit” button.

If the option “manual” is selected under “Defaults”, then the coding rate, the carrier modulation symbol rate, the guard interval and the spectrum inversion can be set manually. The settings made here apply to both channels of the respective pair of output channels. Furthermore, there is the option of configuring the stuffing unit. If the option “TS-Packet Stuffing” is selected, then null packets are generated with usable content which is comprised of zeroes. If the option “PRBS-Packet Stuffing” is selected, then the usable content of the null packets generated is comprised of a random sequence. Choose between 2k-COFDM and 8k-COFDM mode by activating the corresponding radio button.

Select the required coding rate (1/2, 2/3, 3/4, 5/6, 7/8) from the drop-down list in the “Parameter” line. Select one of the options “QPSK, 16-QAM or 64-QAM” as the carrier module from the drop-down list below it. In the “Spectrum” line, you can select 6, 7 or 8 MHz for the channel bandwidth from the drop-down list. To activate the inversion, click the corresponding radio button below “Inversion”.

9.2.2 Processing the transport stream

The U 174 allows you to process the transport stream. In the “SID/PID-Filter” line, the filtering can be activated (“On”) or deactivated (“Off”). Furthermore, there is the option of configuring either a drop filter or pass filter. Drop filtering removes the selected IDs from the transport stream, Pass filtering only transmits the selected IDs and discards all others.

Transport Stream Processing

Property	Value
SID/PID-Filter	<input checked="" type="radio"/> on <input type="radio"/> off <input type="radio"/> Drop-Filter <input checked="" type="radio"/> Pass-Filter Drop-SID: Please select <input type="text"/> SID <input type="button" value="Add"/>
	SID-List: <ul style="list-style-type: none"> <input checked="" type="checkbox"/> SID 28486 (SR Fernsehen, ARD) <input type="checkbox"/> Remove all <input type="button" value="Remove"/>
	Drop-PID: Please select <input type="text"/> PID <input type="button" value="Add"/>
	PID-List: <ul style="list-style-type: none"> <input checked="" type="checkbox"/> PID 001 manual <input type="checkbox"/> PID 0 (SI-Table PAT) <input type="checkbox"/> PID 1 (SI-Table CAT) <input type="checkbox"/> PID 17 (SI-Table SDT) <input type="checkbox"/> PID 100 (SID: 28400 Bayern 1, ARD BR, SI-Table PMT) <input type="checkbox"/> PID 101 (SID: 28400 Bayern 1, ARD BR, ISO/IEC 11172 Audio) <input type="checkbox"/> PID 110 (SID: 28401 Bayern 2, ARD BR, SI-Table PMT) <input type="checkbox"/> PID 111 (SID: 28401 Bayern 2, ARD BR, ISO/IEC 11172 Audio) <input type="checkbox"/> PID 120 (SID: 28402 BAYERN 3, ARD BR, SI-Table PMT) <input type="checkbox"/> PID 121 (SID: 28402 BAYERN 3, ARD BR, ISO/IEC 11172 Audio) <input type="checkbox"/> PID 130 (SID: 28403 BR-KLASSIK, ARD BR, SI-Table PMT) <input type="checkbox"/> PID 131 (SID: 28403 BR-KLASSIK, ARD BR, ISO/IEC 11172 Audio) <input type="checkbox"/> PID 132 (SID: 28403 BR-KLASSIK, ARD BR, ISO/IEC 13818-1 Private PES data packets) <input type="checkbox"/> PID 140 (SID: 28404 B5 aktuell, ARD BR, SI-Table PMT) <input type="checkbox"/> PID 141 (SID: 28404 B5 aktuell, ARD BR, ISO/IEC 11172 Audio) <input type="checkbox"/> PID 150 (SID: 28405 BAYERN plus, ARD BR, SI-Table PMT) <input type="checkbox"/> PID 151 (SID: 28405 BAYERN plus, ARD BR, ISO/IEC 11172 Audio) <input type="checkbox"/> PID 160 (SID: 28406 on3-radio, ARD BR, SI-Table PMT) <input type="checkbox"/> PID 161 (SID: 28406 on3-radio, ARD BR, ISO/IEC 11172 Audio)
PID-Remapping	<input checked="" type="radio"/> on <input type="radio"/> off Input-PID: Remapping-List:

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Figure 23: Processing the transport stream

If service filtering using the SID filter is selected, then all subordinate PIDs within the service will also be removed from the transport stream, or transmitted. When PID filtering is used, only the respective PID selected will be removed or transmitted. The respective PIDs appear in the SID or PID list after selection. PIDs for filtering are activated by clicking the “Add” button and removed by ticking them before clicking the “Remove” button.

The U 174 provides a PID remap function, i.e. PIDs used on the input side can be renamed and added to the output data stream with a new PID. To set a filter like this, select a PID from the drop-down menu, enter the new PID in the “Output-PID” field and then programme it using the “Add” button. Renamed PIDs then appear in the “Remapping list”. If you need to remove a remap filter, then mark the entry in the remapping list and remove it by clicking the “Remove” button.

9.3 NIT processing

The link “NIT Processing” in the left frame will reroute you to following example view:



Figure 24: Activating NIT Processing / Upload NIT

9.3.1 NIT remapping

If there is an NIT in the data stream under a different PID than the 0x0010, this NIT can be used in the output data stream by means of the Remap filter. To do so, the input PID for the output channel concerned is entered in the “Remap NIT from PID” field, ticked, and the filter set using the “Submit” button. The Remap filter for the NIT set here is also displayed for the PID Remap filters under “RFx.y Channel Settings”.

9.3.2 Using a static NIT

The “Generate from static NIT” line allows you to select whether a static NIT is used for each output channel separately. If this option is activated, then there is the option of using either NIT 1 or NIT 2 for the respective pair of channels. This selection can also be activated by pressing the “Submit” button. Creating an NIT is described in chapter 9.3.4.

9.3.3 Uploading an NIT

There is an option of loading a prepared NIT in .xml format onto the U 174. This NIT must appear in the upload path with the file name “nit.xml” or “nit2.xml”. This allows the NIT to be duplicated on several devices once it has been created.

9.3.4 Creating a static NIT

The static NIT can be generated using the input mask shown as an example below:

ASTRO EdgeCOFDM U174
Generate Static NIT 1
 Time: 18 Nov 2011 08:43:56 UTC, Up: 0d 16h 41m 23s, SW:4419 FW:1.8 HW:4
 Name: ASTRO EdgeCOFDM U174, Location: Headend in Cablecity, Contact: John Doe, admin@example.com

Change Network Information

Network ID: 0 Network Name: Astro NETZ

Transport Stream Settings

Transport Stream ID	Original Network ID	Channel Frequency	Bandwidth	Constellation	Code Rate	Guard Interval	COFDM Mode	
		manual	8 MHz	64 QAM	7/8	1/32	2k	Add

Sort	Transport Stream ID	Original Network ID	Channel Frequency	Bandwidth	Constellation	Code Rate	Guard Interval	COFDM Mode	Remove
↑	1093	1	D706 706.0000 MHz	8 MHz	64 QAM	7/8	1/32	2k	☐
↑	1051	1	D714 714.0000 MHz	8 MHz	64 QAM	7/8	1/32	2k	☐
↑	1078	1	D722 722.0000 MHz	8 MHz	64 QAM	7/8	1/32	2k	☐
↑	1024	1	D730 730.0000 MHz	8 MHz	64 QAM	7/8	1/32	2k	☐

Note: The order of the Transport Streams in the generated NIT is equivalent the order in this HTML table. To sort this table click on the table headers or the arrow buttons in front of each row.

Submit Reset Form

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Input of the network ID and the network name

Input of the transport stream details: TS-ID, ON-ID, channel frequency, modulation type and code rate. Add the TS using the "Add" button

Display of the NIT with all entries

Sorting function in the "Sort" column using "arrow up" and "arrow down"

To remove an entry, tick the "Remove" column and click "Submit"

Figure 25: Input mask for NIT entry

10 User management

You can access the user management by clicking on the “User” submenu. The U 174 allows you to create four different users. In the delivery state, “admin”, “user” and “controller” have been installed, all with the password “astro”.

Only account 1 can make IP settings (chapter 6) and the set the option “Lock RF-relevant settings” (chapter 9).

Note:



For security reasons, the user names and passwords used in the delivery state should be changed. This prevents unauthorized access.

The number of minutes after which the U 174 automatically logs the user out if no configuration change has been registered during this period is entered in the “Timeout” line.

You can enter the name, location and responsible contact person in the lower area of the “User Administration” table. This information also appear in the top frame.

You can enter the name, location and responsible contact person in the lower area of the “User Administration” table. This information also appears in the top frame and can be found in the corresponding SNMP variables.



ASTRO EdgeCOFDM U174
User Administration
 Time: 18 Nov 2011 08:43:57 UTC, Up: 0d 16h 41m 24s, SW:4419 FW:1.8 HW:4
 Name: ASTRO EdgeCOFDM U174, Location: Headend in Cablecity, Contact: John Doe, admin@example.com

● ASTRO EdgeCOFDM U174
 ● MgmA 192.168.1.172
 ● MgmB 192.168.5.172
 ● admin is logged in

User Administration

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 EdgeCOFDM U174			
Location	Headend in Cablecity			
Contact	John Doe, admin@example.com			

Leave input box empty to keep settings. To disable account 2, 3 or 4 set an empty username. Please use no passwords shorter than five characters

Note: There ist no hidden password. Do not forget your password or you will be locked out.

Submit ResetForm

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admin on 192.168.1.62 is logged in

Figure 22: User management

Changes must be applied to the U 174 using “Submit”.

11 Transport Stream (TS) Analyzer

Purchase of a licence allows the U 174 to be equipped with a Transport Stream Analyzer. This Analyzer displays the structure of the MPEG2 TS, from the tables to the individual PIDs and their service. You click on the “TS Analyzer” submenu to select the transport stream for analysis. When you select a TS in the “Analyze” line and press the “Submit” button, the selected transport stream will be analysed.

ASTRO EdgeCOFDM U174
TS Analyzer
 Time: 18 Nov 2011 08:43:57 UTC, Up: 0d 16h 41m 24s, SW:4419 FW:1.8 HW:4
 Name: ASTRO EdgeCOFDM U174, Location: Headend in Cablecity, Contact: John Doe, admin@example.com

ASTRO EdgeCOFDM U174
 MgmtA 192.168.1.172
 MgmtB 192.168.5.172
 admin is logged in

Status
 Logout
 Main
 Test Gen
 IP Channel
 IP RX1
 IP RX2
 IP RX3
 IP RX4
 RF
 RF 1 1
 RF 1 2
 RF 2 1
 RF 2 2
 NIT Processing
 NIT 1
 NIT 2
 User
 TS Analyzer
 Licensing
 Update
 System Log
 Statistics
 Network
 admin on 192.168.1.62 is logged in
 Timeout in 78 s

TS Analyzer

Alias	Bays in 1, ARD BR	Emis Extra, ARD	DATA SYST EM TR 78, MTV Networks Europe	TELE MELO DY, CSAT	ASTRO
TSID ONID	1093 1	1051 1	1078 1	1024 1	05535 05535
Source	IP RX1	IP RX2	IP RX3	IP RX4	Test Gen
Analyze	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

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

Submit Reset Form

Analyzing SI Tables...

- PAT (PID:0), TSID:1093, version:0, valid:current, SDT actual (PID:17), TSID:1093, ONID:1, version:1, valid:current
 Emptyfolder SID:0, NID_PID:16
 - SID:28400, PMT_PID:100
 - PMT (PID:100), SID:28400, PCR_PID:101, version:4, valid:current
 - SDT Status:running, Free, EIT_present_following, EIT_schedule
 Emptyfolder Service, name:Bayern 1, provider:ARD BR, type:Radio
 Emptyfolder Private_data_specifier, 0x00000001
 Emptyfolder Oxa0
 Emptyfolder Oxa1
 - SID:28486, PMT_PID:1300
 - PMT (PID:1300), SID:28486, PCR_PID:1301, version:4, valid:current
 - SDT Status:running, Free, EIT_present_following, EIT_schedule
 Emptyfolder Service, name:SR Fernsehen, provider:ARD, type:TV
 - SID:28487, PMT_PID:1400
 - PMT (PID:1400), SID:28487, PCR_PID:1401, version:4, valid:current
 - SDT Status:running, Free, EIT_present_following, EIT_schedule
 Emptyfolder Service, name:BR-alpha, provider:ARD, type:TV
- Emptyfolder CAT (PID:1), version:0, valid:current
- NIT actual (PID:16), NID:1, version:25, valid:current
- Emptyfolder TDT (PID:20), UTC:18 Nov 2011 12:49:15

...done!

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Figure 23: Transport Stream (TS) Analyzer view

The TS Analyzer, available as an option, provides an effective way of checking that the IP input signal is complete in terms of the services / tables it contains. Once an analysis has started, it can take several minutes to complete. The analysis of the EIT (Event Information Table) can, in particular, take somewhat longer.

12 Licensing

The TS Analyzer must be enabled using a licence key. You can purchase the licence key from ASTRO. The text which is sent is copied into the text input field and applied to the device using the “Submit” button.

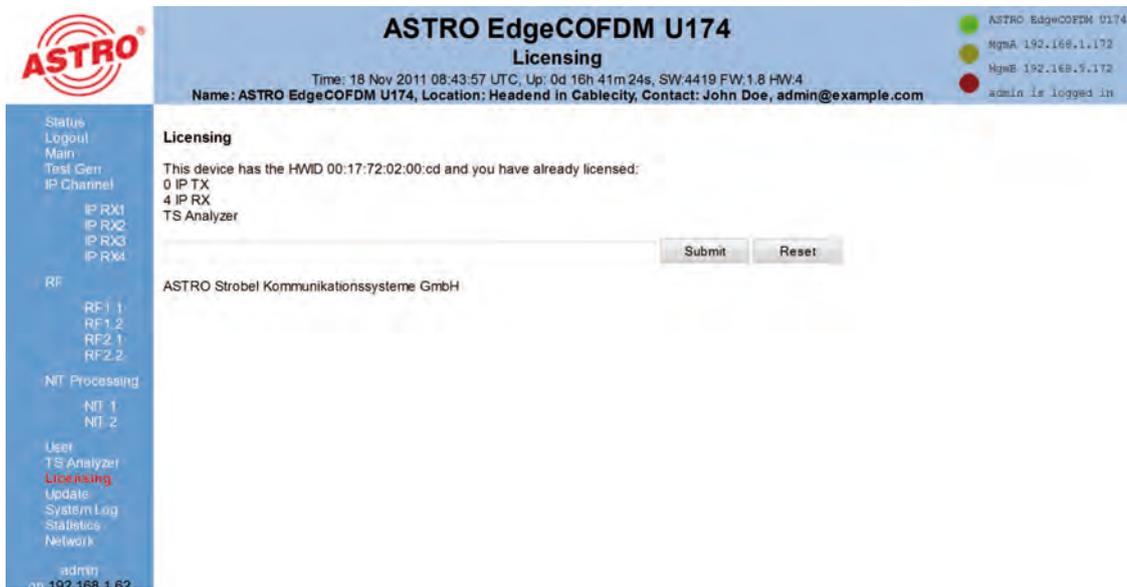


Figure 24: Input mask for licence key

To order licences, you must specify the MAC address of the device. You will find the MAC address on the Web browser interface, in the “Licensing” submenu (HWID). Once you have shared the MAC address, the licence keys are generated at the ASTRO company and issued by e-mail or on a CD.

The format of a licence key is a text document (e.g. Lic001772000222.txt). You can use copy / paste to copy the key(s) into the input mask, and press the “Submit” button to transfer the licences to the U 174. If the licence is valid, this is confirmed by the message “License is valid”. An error message is displayed for an invalid licence.

13 Software update / Saving and loading a configuration

When you click on the “Update” submenu in the left frame, the following window appears (example):



ASTRO EdgeCOFDM U174
Software Update
 Time: 18 Nov 2011 08:43:57 UTC, Up: 0d 16h 41m 24s, SW:4419 FW:1.8 HW:4
 Name: ASTRO EdgeCOFDM U174, Location: Headend in Cablecity, Contact: John Doe, admin@example.com

ASTRO EdgeCOFDM U174
 MemA 192.168.1.172
 MemB 192.168.5.172
 admin is logged in

Software Update

Property	Value
(T)FTP Server address	192.168.1.111
Protocol	FTP <input type="radio"/> TFTP <input checked="" type="radio"/>
FTP Username (e.g. anonymous)	anonymous
FTP Password (e.g. guest)	*****
Path	/update/
Version	
Mode	Please select

For a quick start you may want to use the [Tftp32](#) server. Please adjust your firewall to allow (T)FTP traffic. Username and password are only used for FTP. Please consider that the given path must exist on the server before any transfer is started.

Note: Load config excludes IP interface Settings.

IP configuration in XML format: [ip.xml](#)
 Module info in XML format: [module.xml](#)
 System settings in XML format: [settings.xml](#)
 System status in XML format: [status.xml](#)
 System measurements in XML format: [measure.xml](#)

Figure 25: Selecting an action in the “Software Upgrade” submenu

You have the option of performing various actions using (T)FTP here. To configure the U 174 for these actions, the server address (“(T)FTP Server Address” line), the protocols used (“Protocol” line), user name and password (“FTP Username (e.g. anonymous)” and “FTP Password (e.g. guest)” lines) and the path should be saved in the data, or loaded from the data (“Path” line). The path is specified relative to the root directory of the FTP server, and must begin with a “/” and also end with a “/”.

The actions to be performed are selected in the “Mode” line. To ensure the required action can be performed, make sure that the path specified does exist on the server. You must also ensure that any firewall installed allows (T)FTP communication.

Load Config from server:

The configuration stored on the (T)FTP server is copied to the U 174 and activated with immediate effect. The IP settings for the data and management interfaces on the device are not changed. When “Load Config from server” is used, “settings.xml”, “NIT 1.xml” and “NIT 2.xml” are written into the U 174.

Save Config to server:

The current configuration of the U 174 is written onto the (T)FTP server. This configuration contains diverse files:

“ip.xml”:	IP settings for the data and management interfaces
“user.xml”:	User accounts created
“settings.xml”:	All other settings (e.g. IP receiver and modulator settings)
“status.xml”:	Current operating status
“module.xml”:	Description of the device for the controller U 100-C
“measure.xml”:	Reference levels
“chlist.xml”:	Allocation of the channel names to the image carrier frequencies
“NIT 1.xml”:	NIT no.1 for installation in a pair of output channels
“NIT 2.xml”:	NIT no.2 for installation in a pair of output channels

Update firmware from server:

If this action is selected, then the required software version must be specified in the "Version" line (max. 4 characters). After the update is complete, the following message appears: "Firmware update from SD card OK Ready Please Reboot to use new firmware". After a reboot, the device will operate with the new firmware.

Load firmware from server:

A software version stored on the server is saved on the SD card of the U 174. The old software version will continue to run after a reboot. Several different software versions can be saved on the SD card.

Update firmware from SD card:

The required software version must also be specified in the "Version" line when this action is performed. If a version is selected which has not been saved to the SD card, then an error message appears.

Overwrite backup firmware:

The U 174 can also be operated from the so-called "Backup area". This may occur when there is a fault in the standard area of the internal Flash memory of the U 174. The device does not fail, however will in this case operate from the "Backup area" of the internal Flash memory. The firmware found in this area is the so-called "Backup firmware". To prevent unwanted operating states, this "Backup firmware" should be overwritten after completing an update.

Note:

If the U 174 is running in the backup area, then the action "Overwrite backup firmware" must not, under any circumstances, be started in this operating mode. This will result in a complete failure of this device, which will need to be returned to the manufacturer!



13.1 Update using a TFTP server for Windows as an example

If no fixed (T)FTP server has been set up for the U 174 update, you also have the option of transferring locally saved update files onto the device. In this case, using a TFTP programme is recommended. The procedure is described in the following section using the "Tftpd32" programme.

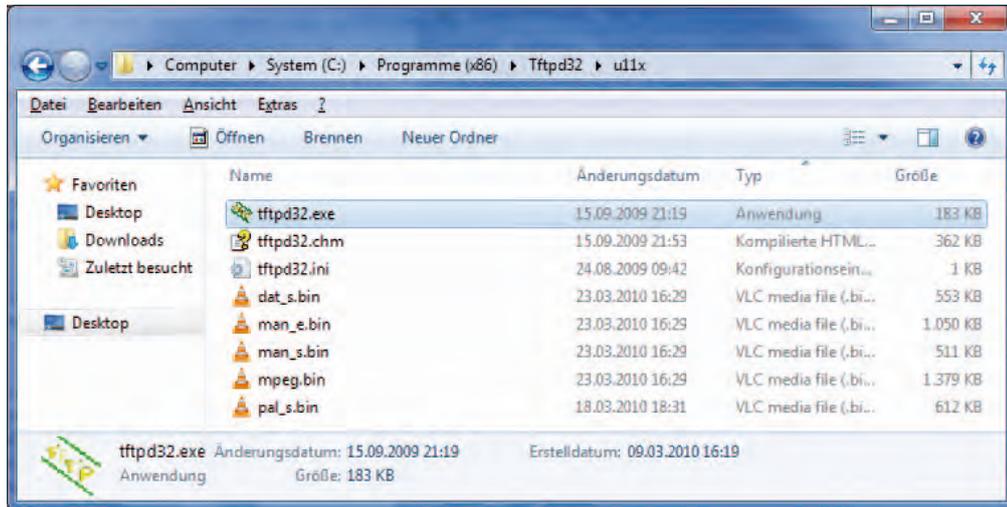


Figure 26: Example view of the U 154 update folder with update files and “tftpd32” TFTP programme.

The “tftpd32” programme is started directly from the folder with the U 174 update files. In the window that appears, you first press the “Settings” button, then enter the settings according to Figure 27:

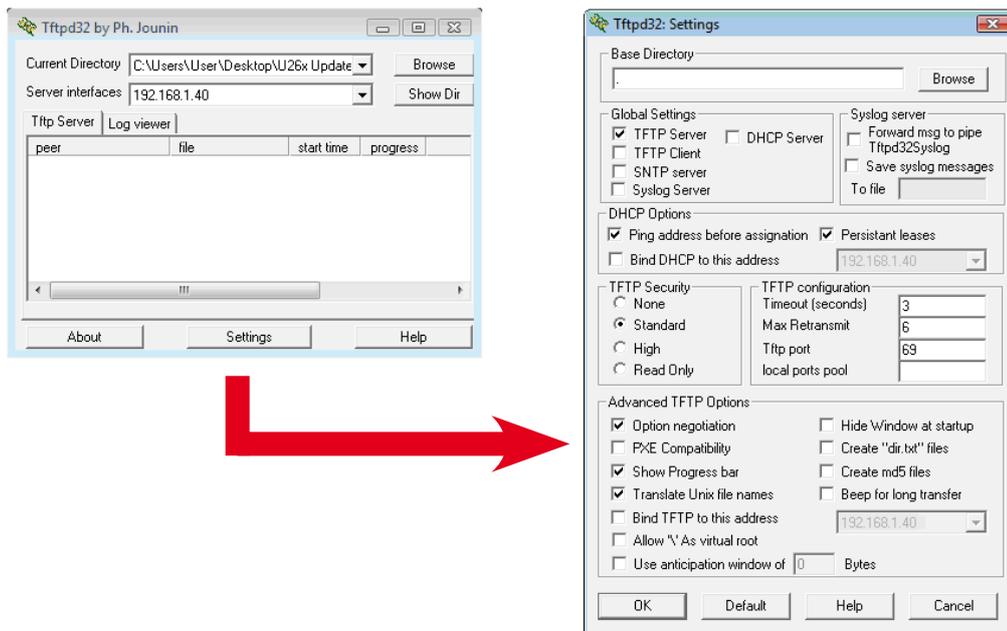


Figure 27: Settings for the tftpd32 TFTP programme

To start the update, the IP address of the local computer must be entered as the server address in the line “(T)FTP Server address” (Figure 23), and the protocol must be set to TFTP. This makes entering a user name and a password unnecessary. You now select the option “Update” in the “File” line, and press the “Submit” button to start the update.



NOTE:

A reboot or a network failure during an update process can cause an irreversible crash of the U 174 software. The device then has to be returned to ASTRO for repair.

14 System log



You can access the log of the U 174 by clicking on the “System Log” submenu. All the procedures relevant to the operation of the device are documented here. Additionally, the SNMP settings are made here (defining the trap recipients, the trap community & the trap filter). The “Log file filter” line can also be used to define which events lead to an entry in the log.

ASTRO EdgeCOFDM U174

System Log

Time: 18 Nov 2011 08:43:58 UTC, Up: 0d 16h 41m 25s, SW:4419 FW:1.8 HW:4
Name: ASTRO EdgeCOFDM U174, Location: Headend in Cablecity, Contact: John Doe, admin@example.com

● ASTRO EdgeCOFDM U174

● IP: 192.168.1.172

● IP: 192.168.5.172

● admin is logged in

System Log Settings

Property	Value 1	Value 2	Value 3	Value 4
Log file filter	<input checked="" type="checkbox"/> Emergency, <input checked="" type="checkbox"/> Alert, <input checked="" type="checkbox"/> Critical, <input checked="" type="checkbox"/> Error, <input checked="" type="checkbox"/> Warning, <input checked="" type="checkbox"/> Notice, <input checked="" type="checkbox"/> Info, <input checked="" type="checkbox"/> Debug			
Syslog server	0.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0
Syslog filter	<input checked="" type="checkbox"/> Emergency, <input checked="" type="checkbox"/> Alert, <input checked="" type="checkbox"/> Critical, <input checked="" type="checkbox"/> Error, <input checked="" type="checkbox"/> Warning, <input checked="" type="checkbox"/> Notice, <input checked="" type="checkbox"/> Info, <input checked="" type="checkbox"/> Debug			
SNMP trap receiver	0.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0
SNMP trap community	public	public	public	public
SNMP trap filter	<input checked="" type="checkbox"/> Emergency, <input checked="" type="checkbox"/> Alert, <input checked="" type="checkbox"/> Critical, <input checked="" type="checkbox"/> Error, <input checked="" type="checkbox"/> Warning, <input checked="" type="checkbox"/> Notice, <input checked="" type="checkbox"/> Info, <input checked="" type="checkbox"/> Debug			
SNMP access	<input type="checkbox"/> on <input checked="" type="checkbox"/> off			
SNMP GET/SET community	public			
Access permission	<input checked="" type="checkbox"/> Read <input checked="" type="checkbox"/> Write	<input checked="" type="checkbox"/> Read <input checked="" type="checkbox"/> Write	<input checked="" type="checkbox"/> Read <input checked="" type="checkbox"/> Write	<input checked="" type="checkbox"/> Read <input checked="" type="checkbox"/> Write
SNMP authentication failure trap	<input type="checkbox"/> on <input checked="" type="checkbox"/> off			
Debug log file	<input type="checkbox"/> on <input checked="" type="checkbox"/> off			

Note: Use empty fields for unused SNMP addresses or communities.

SNMP MIBs

AstroStrobel.mib
AstroStrobel-EdgeCOFDM.mib

System Log

Check box to clear log on refresh

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

IP configuration in XML format: [ip.xml](#)
Module info in XML format: [module.xml](#)
System settings in XML format: [settings.xml](#)
System status in XML format: [status.xml](#)
System measurements in XML format: [measure.xml](#)
Channel list in XML format: [chlist.xml](#)

English manual: [u174mane.pdf](#)
German manual: [u174mang.pdf](#)
Use right click and "save as" to save locally.

number	time	uptime	user	source	severity	message
1	18 Nov 2011 08:43:22 UTC	0d 16h 40m 49s	admin	192.168.1.62	info	Login
2	18 Nov 2011 08:16:25 UTC	0d 16h 13m 52s	system	local	info	Login timeout
3	18 Nov 2011 08:04:29 UTC	0d 16h 01m 56s	admin	192.168.1.62	info	Login
4	18 Nov 2011 07:38:20 UTC	0d 15h 35m 47s	system	local	info	Login timeout
5	17 Nov 2011 10:39:26 UTC	0d 00h 00m 33s	boot	local	info	SW:4419 FW:1.8 HW:4
6	17 Nov 2011 10:39:25 UTC	0d 00h 00m 32s	boot	local	notice	ASTRO EdgeCOFDM U174
7	17 Nov 2011 10:39:25 UTC	0d 00h 00m 32s	boot	local	debug	Start HTTP watchdog
8	17 Nov 2011 10:39:25 UTC	0d 00h 00m 32s	boot	local	debug	Start HTTPD
9	17 Nov 2011 10:39:24 UTC	0d 00h 00m 31s	boot	local	debug	Start measurements
10	17 Nov 2011 10:39:24 UTC	0d 00h 00m 31s	boot	local	debug	Start SI analyzer
11	17 Nov 2011 10:39:23 UTC	0d 00h 00m 30s	boot	local	debug	Set RF channels
12	17 Nov 2011 10:39:23 UTC	0d 00h 00m 30s	boot	local	debug	Start gratuitous ARP
13	17 Nov 2011 10:39:22 UTC	0d 00h 00m 29s	boot	local	debug	Start serial FP
14	17 Nov 2011 10:39:22 UTC	0d 00h 00m 29s	boot	local	debug	Start display
15	01 Jan 1970 00:00:26 UTC	0d 00h 00m 26s	boot	local	debug	init ADC2
16	01 Jan 1970 00:00:26 UTC	0d 00h 00m 26s	boot	local	debug	init ADC1
17	01 Jan 1970 00:00:26 UTC	0d 00h 00m 26s	boot	local	debug	init MOD2
18	01 Jan 1970 00:00:26 UTC	0d 00h 00m 26s	boot	local	debug	init MOD1
19	01 Jan 1970 00:00:25 UTC	0d 00h 00m 25s	boot	local	debug	init DAC2
20	01 Jan 1970 00:00:25 UTC	0d 00h 00m 25s	boot	local	debug	init DAC1
21	01 Jan 1970 00:00:24 UTC	0d 00h 00m 24s	boot	local	debug	init PLL
22	01 Jan 1970 00:00:17 UTC	0d 00h 00m 17s	boot	local	debug	Load OFDM_S
23	01 Jan 1970 00:00:17 UTC	0d 00h 00m 17s	boot	local	debug	Set IP channels
24	01 Jan 1970 00:00:17 UTC	0d 00h 00m 17s	boot	local	debug	Start snmpd
25	01 Jan 1970 00:00:16 UTC	0d 00h 00m 16s	boot	local	debug	init services
26	01 Jan 1970 00:00:14 UTC	0d 00h 00m 14s	boot	local	debug	init eth interfaces
27	01 Jan 1970 00:00:11 UTC	0d 00h 00m 11s	boot	local	debug	Load settings
28	01 Jan 1970 00:00:10 UTC	0d 00h 00m 10s	boot	local	info	Coldstart
29	01 Jan 1970 00:00:10 UTC	0d 00h 00m 10s	boot	local	info	SW:4419 FW:1.8 HW:4
30	01 Jan 1970 00:00:10 UTC	0d 00h 00m 10s	boot	local	notice	ASTRO EdgeCOFDM U174

HWD 00:17:72:02:00:0d

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Figure 28: System log settings



The SNMP MIBs available are stored on the U 174 and can be downloaded from the device.

The operations listed in the system log are sorted according to the time they occurred. To delete the log file, you tick “Check box to clear log on refresh”, and click on the “Refresh” button. The first entry in the log will then be the deletion operation, together with the time and the user account, as well as the IP address of the user.



NOTE:

- Download the IP configuration using the link “ip.xml”
- Download the module information using the link “module.xml”
- System settings using the link “settings.xml”
- System entries using the link “status.xml”
- Download the measurements for the reference level using the link “measure.xml”
- Download the channel list using the link “chlist.xml”

15 Statistics

You can access the statistics on the data transfer by the U 174 by clicking on the “Statistics” sub-menu. All the statistics relevant to the operation of the device and its analysis are displayed here.

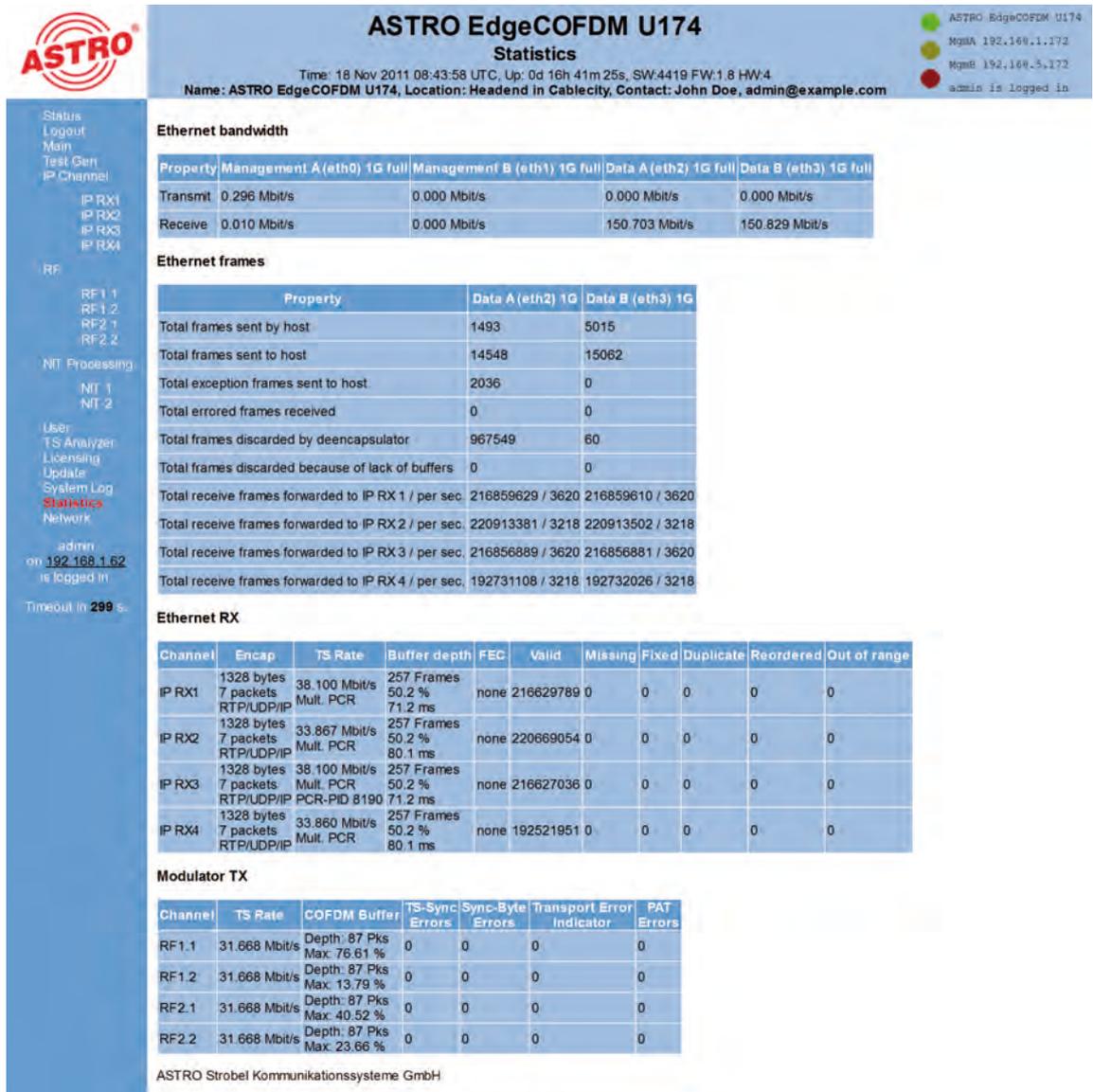


Figure 29: Statistics on the data transfer

16 Network properties

The screenshot displays the 'ASTRO EdgeCOFDM U174 Network Monitor' interface. It features a sidebar with navigation options like 'Home', 'Status', 'Configuration', and 'Tools'. The main content area is divided into several sections:

- Interface statistics:** A table showing details for multiple interfaces (eth0, eth1, eth2, eth3, eth4, eth5, eth6, eth7, eth8, eth9, eth10, eth11, eth12, eth13, eth14, eth15, eth16, eth17, eth18, eth19, eth20, eth21, eth22, eth23, eth24, eth25, eth26, eth27, eth28, eth29, eth30, eth31, eth32, eth33, eth34, eth35, eth36, eth37, eth38, eth39, eth40, eth41, eth42, eth43, eth44, eth45, eth46, eth47, eth48, eth49, eth50, eth51, eth52, eth53, eth54, eth55, eth56, eth57, eth58, eth59, eth60, eth61, eth62, eth63, eth64, eth65, eth66, eth67, eth68, eth69, eth70, eth71, eth72, eth73, eth74, eth75, eth76, eth77, eth78, eth79, eth80, eth81, eth82, eth83, eth84, eth85, eth86, eth87, eth88, eth89, eth90, eth91, eth92, eth93, eth94, eth95, eth96, eth97, eth98, eth99, eth100). Each entry includes IP address, MAC address, and various statistics.
- Routing tables:** A table with columns for destination, gateway, metric, and flags/metric/protocol. It lists various network destinations and their associated gateways and metrics.
- Protocols:** A detailed view of network protocols, including ICMP, TCP, UDP, and others. It shows statistics for each protocol, such as total packets, data received, and various error or drop counts.
- Status:** A summary section providing an overview of system health, including CPU usage, memory usage, and other key performance indicators.

You can access the network properties by clicking the “Network Monitor” submenu. The properties displayed are purely for information purposes, and are used to describe the network.

Figure 30: Example view of the network properties in the “Network Monitor” submenu



17 Logout

Clicking on the “Logout” submenu (only available when you are logged in) will reroute you to the U 174 logout.

User Logout

Are you sure?

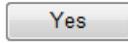


Figure 31: Logging out of the U 174

If you confirm the request by clicking “Yes”, you will be logged out. No further settings can be made without logging in again, but you do have the option of viewing the settings in the U 174. However, the setting elements are inactive.

18 Technical data



Type		U 100 - 48	U 100 - 230
Order number		380 100	380 101
EAN code		4026187611064	4026187611149
Network interfaces (passive routing to U 1xx)			
Management		2 x 100 Base-T Ethernet (RJ 45)	
Data		2 x 1000 Base-T Ethernet (RJ 45)	
Protocol		IEEE802.3 Ethernet, RTP, ARP, IPv4, TCP/UDP, HTTP, SNMP, IGMPv3	
Transport stream processing			
TS capsulation		UDP, UDP / RTP, 1-7 packets, FEC	
Transport stream processing		transparent (188 or 204 packets)	
Control and management			
Features		Control via HTTP / WEB	
Protocol		HTTP / SNMP (error messages)	
General data			
Voltage supply	[V]	- 48 V DC	230 V AC
Power consumption	[W]	depends on mounting	
Dimensions		19" / 1 HE	
Ambient temperature	[°C]	0...+45	

Type		U 174	
Order number		380 174	
EAN code		4026187611026	
Network interfaces (passive routing to U 1xx)			
Management		2 x 100 Base-T Ethernet (RJ 45)	
Data		2 x 1000 Base-T Ethernet (RJ 45)	
Protocol		IEEE802.3 Ethernet, RTP, ARP, IPv4, TCP/UDP, HTTP, SNMP, IGMPv3	
Transport stream processing			
TS capsulation		UDR, UDP / RTP, 1-7 packets, FEC	
Packet length	[Bytes]	188 / 204	
COFDM modulator			
COFDM Mode		2k	
Carrier modulation		QPSK; 16 QAM - 64 QAM	
Bandwidth	[MHz]	6, 7, 8	
Maximum gross data rate	[Mbit/s]	31.668	
Signal processing		accord. to DVB standard	
Coding rates		1/2, 2/3, 3/4, 5/6, 7/8	
Guard intervals		1/4, 1/8, 1/16, 1/32	
Data rate adjustment		<input checked="" type="checkbox"/>	
PCR correction (< 500 ns accord. to		<input checked="" type="checkbox"/>	
NIT handling (static)		<input checked="" type="checkbox"/>	
PID remapping		<input checked="" type="checkbox"/>	
PID filtering		Drop or Pass PID-Filter	
MER (equalizer)	[dB]	≥ 43	
Shoulder attenuation	[dB]	> 56 (< 700 MHz); > 54 (≥ 700 MHz)	
HF modulator			
Connectors	[Ω]	75, 2 x F-jack	
Frequency range	[MHz]	47 - 862, digitally modulated	
Frequency deviation	[kHz]	< 10	
Output level	[dBμV]	114	
Intermodulation distance	[dB]	> 60	
Return loss	[dB]	> 14	
Spurious frequency distance	[dB]	> 60	
General data			
Power consumption	[W]	28.1	



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