HDI 2 multi

IP Modulator

IP into DVB-C / DVB-T / ISDB-T

Manual

CE EAC

0902252 V2

Contents

1. Mounting- and safety instructions

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

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

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

Transport
Please check the packaging and the device for damages in shipment immediately upon receipt. Do not put a damaged device into operation.
Transporting the device by the power cord is not permitted as this can damage the power cord or the strain relief. Insulation that serves to protect against mains voltages can be damaged by excessive loads (e.g. fall, shock, vibration).

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

Grounding and potential equalisation
Please establish grounding and perform potential equalisation before initial startup. According to the currently valid version of EN 60728-11, coaxial receiving and distribution systems must meet the safety requirements with regard to earthing, equipotential bonding etc, even if the device is removed. Otherwise, damage to the product, fire, or other dangers can occur. In addition, the earth connection on the device can be used. Other devices within touching distance are to be integrated in the equipotential bonding. Operation without a protective conductor connection, device grounding or equipotential bonding is not permitted. If damaged, the device must be taken out of operation.
The electrical system for powering the device, e.g. house installations must contain protective devices against excessive currents, earth faults and short circuits. Follow all applicable national safety regulations and standards.

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

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

Moisture
The devices have no protection against water and may therefore only be operated and connected in dry rooms.
Dripping/splashing water and high humidity damage the device. If there is condensation, wait until the device is completely dry. Select the operating environment according to the specified IP protection class.

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

Mounting and service work

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

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

Repairs

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

Thunderstorm

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

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

Ambient temperature

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

Termination

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

Attention

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

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

» Pay attention permanently to potential equalisation (equipotential bonding)!
» Use wrist straps and approved footwear for personnel grounding!
» Avoid electrostatically chargeable materials such as normal PE, PVC, polystyrene!
» Avoid electrostatic fields >100 V/cm!
» Use only labeled and defined packing and transportation materials!
Damage caused by faulty connections and/or improper handling are excluded from any liability.

Recycling

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

WEEE-Reg.-Nr. DE 51035844

Guarantee conditions

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

GENERAL INFORMATION ON THE OPERATING INSTRUCTIONS

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

2. Description

The IP Modulator HDI 2 multi enables the reception of IP signals from streamers, security cameras or other IP sources and their conversion into a maximum of 2 adjacent digital output channels in the formats DVB-C, DVB-T, DVB-C Annex B or ISDB-T. The device supports the reception of SPTS or MPTS signals. Functions such as Service filtering (for MPTS signals), SI processing, NIT and LCN complete the range of functions. The integrated web server allows the remote control of the modulators as well as fast and easy programming. The management and the connection of the IP transport stream takes place via an RJ45 100Mbit/s interface. The IP modulator offers the possibility to feed IP camera signals into the cable network and make them easily available on different monitors/TV sets. The devices are used wherever IP signals from various sources are to be fed into the existing cable network.

Notes camera settings

The bit rate of the camera output signal must be approx. **20%** of the data rate of the DVB-C channel set in the HDI 2 multi. When setting the video signal it is important to ensure, that the output signal of the transmission path is displayed on a TV set. Please use typical TV resolutions (**720p or 1080p**)! The **AAC** standard must be selected for audio compression because the sound should be playback on the TV set.
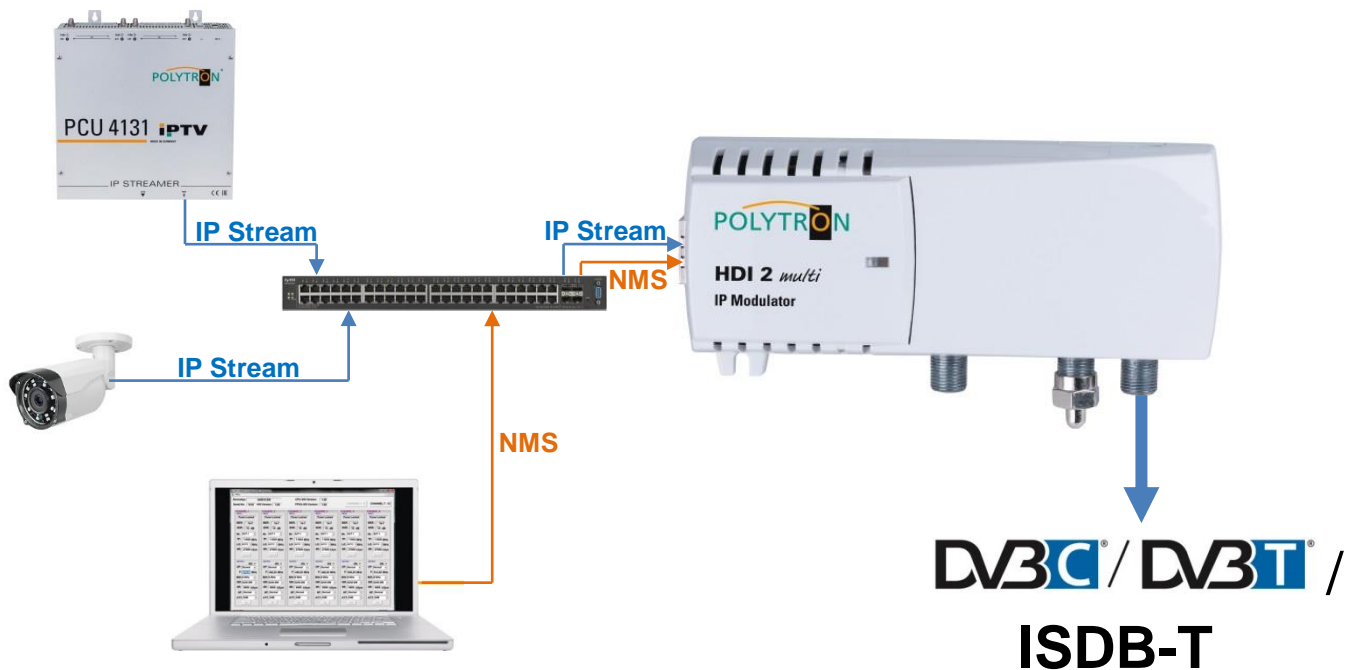
3. Scope of delivery

1 x HDI 2 multi

1 x Plug-in power supply

1 x Quick start guide

4. Function elements
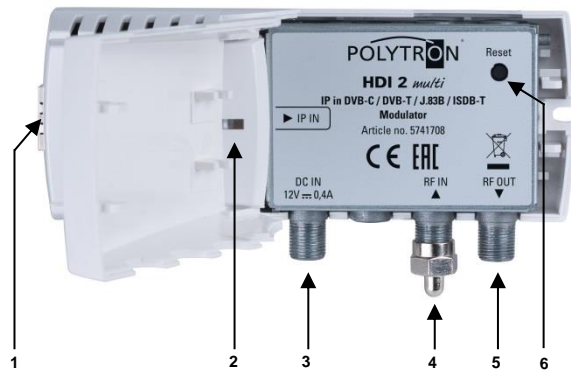
1	IPTV and NMS interface - RJ45 connector
2	Status LED
3	Power supply connector - F with connection for 3.5 mm male connector pressed in
4	RF Loop through input - F female
5	RF output - F female
6	Reset button

5. Mounting

Firstly, please read the mounting and safety instructions in section 1. The installation of the receiving system must be done in accordance with the standard *IEC 60728-11*. That ensures the safety of personnel and prevents equipment damage by lightning or other sources of overvoltage. The modulator must be mounted vertically on a non-flammable wall or in an installation cabinet with the RF sockets facing down. Steel screws with a diameter of 3.5 - 4.0 mm are required for fastening. The screws are not included in delivery. The modulator must have at least 10 cm clearance from the top, front and bottom after installation. The installation slots should be not covered by objects. Otherwise, ventilation of the device will be impaired and may cause damage. Connect the IP source to the RJ45 jack and all necessary RF cables to the appropriate inputs and/or outputs. If the RF loop-through input is not used, it must be terminated with the included 75 Ohm terminating resistor. If this input is used to connect an antenna signal, a decoupling of ≥20dB to the output of the signal source must be ensured. The modulator is powered by an external 12V power supply. Do not connect the modulator's power supply to the mains until all cables are fully connected to the modulator.

= Heat accumulation!!!
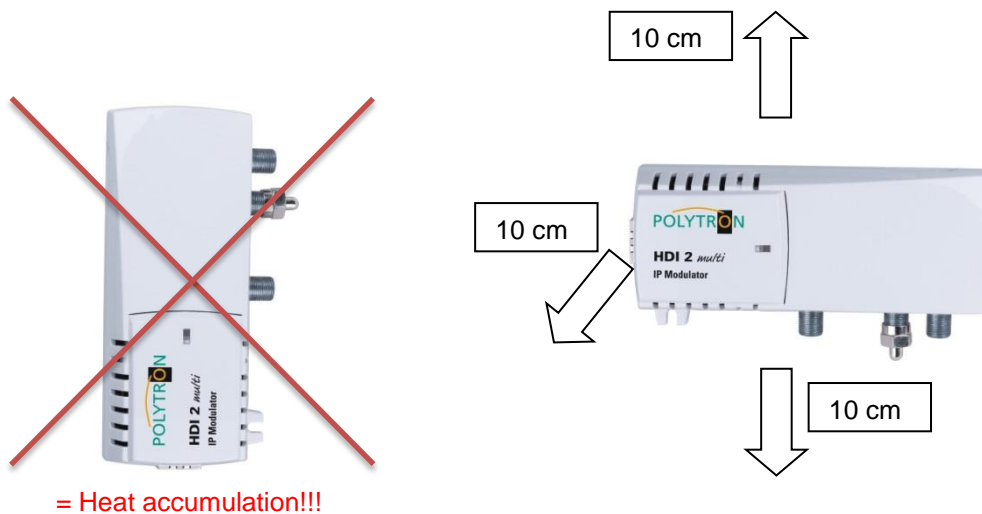
6. Programming via the Ethernet interface (NMS)

Changes to the basic configuration can only be done via the Ethernet interface. The programming as well as the feed of signals from the IP source is done via the RJ-45 jack. The modulator is programmed via the respective HTML user interface and a connected computer. For this, an internet browser is required.

6.1 Network connection to the PC/laptop

System requirements:
→ PC/laptop with Ethernet interface 10/100Mbps
→ Internet browser (e.g. Windows Internet Explorer, Mozilla Firefox, or similar)

Note on setting up a network connection:
PC and IP Modulator should be connected to the network via an Ethernet cable (CAT-5E or CAT-6). For connection acquisition, the IP addresses of the devices must first be matched. The factory settings for the network parameters of HDI 2 multi are shown:
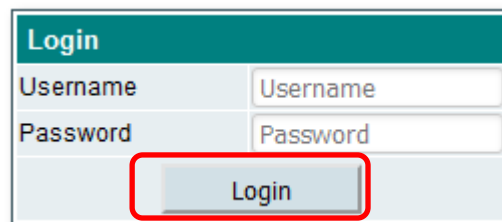
IP address: **192.168.001.010**
Subnet mask: **255.255.255.000**
Gateway: **192.168.001.001**

The address of the network connection at the PC must be adapted to the IP address of the HDI modulator (Subnet mask: 255.255.255.0, IP address: 192.168.001.xxx). xxx must not match the IP address of the HDI 2 multi. Also not allowed are the digits 0, 255 or already used IP addresses. If a proxy server is used, it must be disabled in the network connections. These settings will be done at the PC under "Network connections → LAN connection". After individualization of the IP addresses, the network connection between the devices can be established.

Establishing a connection:
Enter the IP address of the device (Standard IP address: **192.168.001.010**) into the address field of the browser and press the "Enter" key to confirm.
The connection to the device is established and the associated login window will be displayed:

The access to the configuration menu is password protected. The factory settings are as follows:
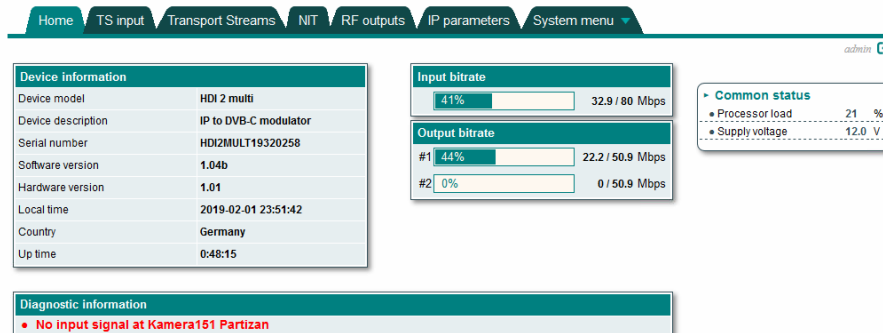
Username: admin
Password: admin

<u>Note</u>

Should the password or the username be lost or forgotten, a general factory reset can be done by pressing the Reset button or via "System menu → Restore defaults". The device reverts to the basic access data and basic settings. Even individualized basic settings (except the Ethernet access data) are lost.

6.2 Home page of the device

After log-in, the device homepage will display the main information about the device and its status. File tabs for programming the HDI 2 multi are available at the top of the window.

In the device description "**Device information**", the most important information about the device will be displayed. The table displays the device type, current selected modulation type, serial number, installed software version, hardware version, time, country and operating hours.
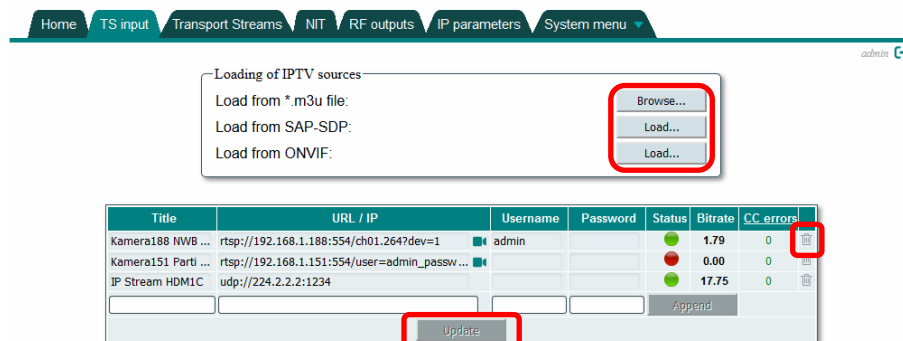
The "**Diagnostic information**" table shows the operating status of the device. If there is an error message, the status LED (5) of the device lights up red. The table "**Input bitrate**" shows the current input bitrate of the IP source. Ensure that the maximum bit rate of 80 Mbit/s is not exceeded. Otherwise the control connection of the device will not be accessible.

The "**Output bitrate**" table displays the current output bit rate and the maximum bit rate allowed for the selected modulation and per output channel. If the value is exceeded, a bit rate overflow will occur and the TV screen will show pixel effects on the display.

The "**Common status**" displays additional status parameters of the device. The parameter "Processor load" indicates the CPU load, which depends mainly on the input and output bit rate. To ensure an error-free operation, make sure that 90% processor load will not exceeded. "Supply voltage" value should correspond to the specified range of +12 V ±1 V.

6.3 Menu item "TS input"

In the menu item "**TS input**", all input transport streams will be configured.

The table contains the list of IPTV sources with all related data. Under "**Title**" a name may be manually assigned to the stream. If the transport stream (or the SDT table) does not contain a title, then the manually assigned title will be used in the output (e.g. for RTSP).Otherwise, the manually assigned title is for information purposes only. "**URL / IP**" displays the URL of the streams. The complete URL including protocol and port number must be entered. If no protocol is entered, the UDP protocol will automatically assign. If the port number is skipped, default port number 1234 for UDP protocol and 554 for RTSP protocol will be used. The fields "**User name**" and "**Password**" will be only used for RTSP. In case of a UDP protocol the fields will be ignored.

The status display describes the status of the input stream with 3 different colors.

● A green circle indicates that a valid signal has been detected.
● A yellow circle indicates the progress of a process. Usually when this is present, RTSP logs appear while the device attempts to connect to the camera.
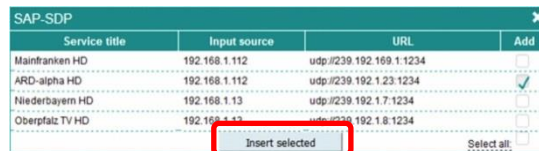● A red circle indicates that no valid stream has been detected.

In the field "**Bitrate**"*,* the measured input bitrate of the stream in Mbit/s will be displayed.

The "**CC errors**" field displays continuity counter errors detected in the stream. By clicking on the title "**CC errors**"*,* all counters in the column will be reset. Clicking on the trash symbol icon on the right will remove the corresponding streams from the stream list. A confirmation window asks for confirmation of the action before the stream is permanently deleted. New streams can be added manually to the table. For this, the empty fields must be filled in accordance with the previous explanation and confirmed by clicking "**Add**". If all streams have been entered, the "**Update**" button must be pressed to accept the stream list.

To edit a stream at the table, simply move with the mouse pointer over the field, press the left mouse button and edit the stream. After the change, press the <TAB> or <ENTER> button, to activate the button "**Update**". After clicking the button "**Update**"*,* all changed values will be sent to the device.

The block "**Loading of IPTV sources**" allows an automatic insert of IPTV sources. The device supports playlists in M3U format. After pressing the button "**Browse…**" the * .m3u file can be selected on the PC. By clicking "Open", the list will be loaded into the table. All unwanted streams can be removed by clicking on the trash symbol icon. To accept the streams, press the button "**Update**".

The list of IPTV sources can also be loaded from the SAP-SDP-IP protocol. To do this, click the "**Load…**" button in the "**Load from SAP-SDP:**" area to display a list of available sources.

SAP-SDP			✕
Service title	Input source	URL	Add
Mainfranken HD	192.168.1.112	udp://239.192.169.1:1234	
ARD-alpha HD	192.168.1.112	udp://239.192.1.23:1234	✓
Niederbayern HD	192.168.1.13	udp://239.192.1.7:1234	
Oberpfalz TV HD	192.168.1.13	udp://239.192.1.8:1234	
	Insert selected		Select all:

Streams that are already in the list are marked and deactivated so as not to replicate them. By selecting the check box "**Add**"*,* streams which should be added to the list can be selected. After pressing the button "**Insert selected**"*,* the selection will be sent to the stream list. By pressing the button "**Update**"*,* the stream list will be saved in the device.

Most IPTV cameras support the ONVIF protocol. The device can automatically detect such cameras in the network. Via clicking on the button "**Load…**" at the line "**Load from ONVIF**"*,* all ONVIF supported cameras will be displayed.

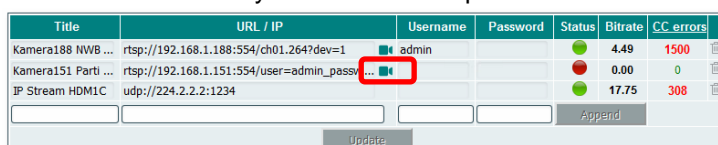| ONVIF		✕
URL		Add
rtsp://192.168.1.78:554		
rtsp://192.168.1.79:554		
	Insert selected	Select all:

By selecting the check box "**Add**"*,* streams which should be added to the list can be selected. After pressing the button "**Insert selected**"*,* the selection will be sent to the stream list.

The missing information must be added manually into the list. It is recommended to give all inserted cameras a name under the item "**Title**". If the camera requires a password, the fields "Username" and "Password" must be completed. If all fields have been completed correctly, click the button "**Update**"*,* and the stream list will be sent to the device.

**Note** The total bit rate in a list must be in the specified range of <80 Mbit/s.

ONVIF supported cameras can be controlled by the device. To open the control window, press the camera icon.

Title	URL / IP		Username	Password	Status	Bitrate	CC errors	
Kamera188 NWB ...	rtsp://192.168.1.188:554/ch01.264?dev=1	📹	admin		🟢	4.49	1500	🗑
Kamera151 Parti ...	rtsp://192.168.1.151:554/user=admin_passw	📹			🔴	0.00	0	🗑
IP Stream HDM1C	udp://224.2.2.2:1234				🟢	17.75	308	🗑
					Append			
	Update							

If the camera supports the ONVIF protocol and the username and password are accepted by the camera, a new window will be opened with a video stream from the camera. The activation of the camera's video stream on the screen occurs after a few seconds. Only H.264 video can be displayed on the screen.
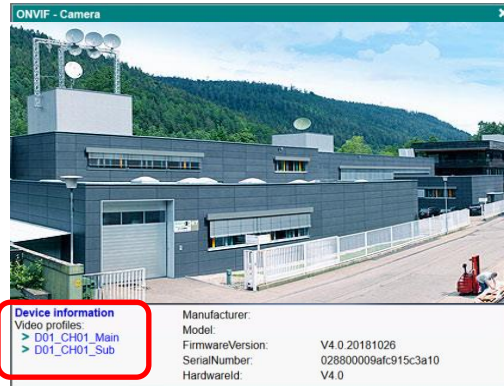
On the left side is the menu of ONVIF. Under "**Device information**", all information about the camera will be displayed. Below this line, all the video profiles that the camera has are listed. By clicking the title of the profile, all parameters of the stream will be listed on the screen.
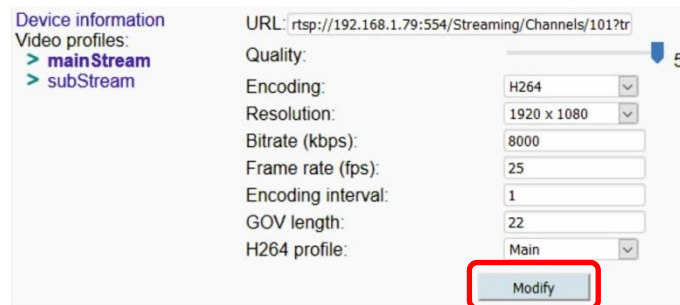

The first line, "**URL**", displays the URL of the stream. This can be copied into the stream list under "**URL/IP**", if required. All other parameters relate to the video configuration of the camera and are for information only. Further information can be found in the data sheet of the camera.

The listed data can be changed in the interface if required. To send the changed parameters to the camera, press the button "**Modify**". Changes of some parameters (e.g. change from H.264 to H.265 or vice versa) can take up to 10 seconds to be applied. The video control window is only a reference for programming, not for monitoring the camera! Note that the video signal has a latency of several seconds.

6.4 Menu item "Transport Streams"

The menu item "**Transport Streams**", displays details about the IP streams. All MPTS transport streams are extracted to individual independent services that can be forwarded to each RF output channel.
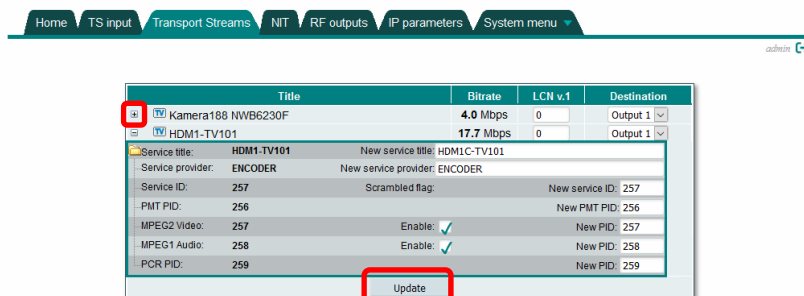
In the column "**Title**", the title of the service is displayed. This is taken from the SDT table, if available. If a title is not found in the stream, it will be taken from the "**TS input**" table.
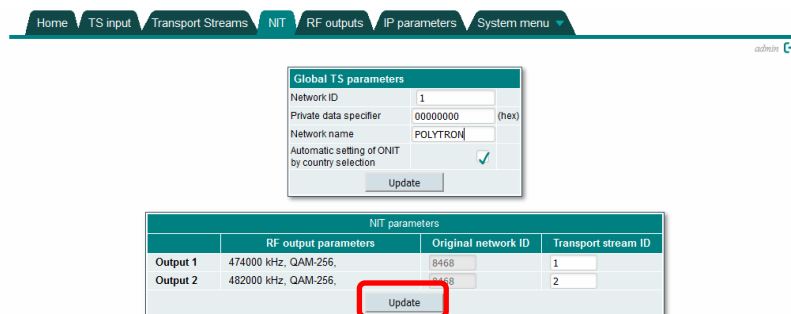
The column "**Bitrate**" indicates the actual input bit rate of the service in Mbit/s.

Under "**LCN v.1**", a logical channel number can be assigned for the service. If the TV supports LCN, the services will be sorted by this number. Zero means that there is no LCN for this channel. Further information on LCN can be found in section 6.5 "**NIT**". In the column "**Destination**", the service may be assigned to the RF output.
By clicking on the plus sign "**+**" on the left side in front of the stream, the table with the PIDs of the transport stream will be expanded. These can be edited here. If all fields have been completed correctly, press the button "**Update**" and the data will be sent to the HDI 2 multi.

6.5 Menu item "NIT"

The menu item "**NIT**" is used to program the specific data for creating a Network Information Table (NIT). The NIT is a transponder table containing information for receiving digital programs.
The NIT creation requires advanced expertise in transmission technology and standards! There are two tables on this page. The first table "**Global TS parameters**", contains the high-level network parameters. If other devices are on the same network, they must have the same parameters as this.

The item "**Network ID**" is a network identification that depends on country, operator and network type.
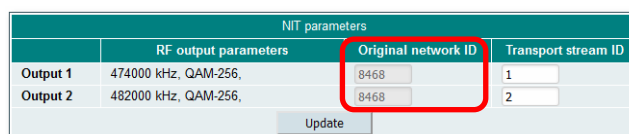Exact values can be found at https://www.dvbservices.com/identifiers/network_id .
"**Private data specifier**" refers to the LCN provider. A zero value in this field means that no private data descriptor is inserted. Some example values for this field are listed in the table below.

For a list of all values see https://www.dvbservices.com/identifiers/private_data_spec_id .

Values for Private data specifier:

Region	Private data specifier
EACEM	00000028
Nordig	00000029
Schweden	000022F1
UK	0000233A

In the field "**Network name**", a title for the network can be assigned. In this field, you can enter any text. If the check box "**Automatic setting of ONIT by country selection**" is activated, the device automatically assigns the value of the original network ID in the table "**NIT parameters**" based on the selected country. Otherwise, these values can be edited manually.

The table "**NIT-Parameter**" contains parameters for each RF channel. The column "**RF output parameters**" shows the programmed output frequency and the modulation. The data will be outputted from the device. The column "**Original network ID**" displays the network ID of the transport stream. The device calculates the value automatically, if the check box "**Automatic setting of ONIT by country selection**" is activated. If a different value is desired, clear this check box and enter the value manually. Normally, the "**Original network ID**" is the same for all output channels throughout the network.

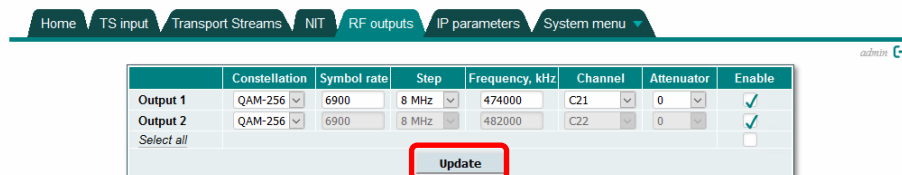Exact values can be found at https://www.dvbservices.com/identifiers/original_network_id .
The "**Transport stream ID**" must be unique for each RF channel in the entire network. If other modulators are present in the same network ensure that this number is not in conflict with other modulators!
Modulators can mutually recognize each other in the LAN via the SSDP protocol and send information to each other via RF so that TV sets can automatically scan all RF channels. When all fields have been completed correctly, press the button "**Update**" and the data will be sent to the device.

6.6 Menu item "RF outputs"

In the menu item "**RF outputs**", the RF parameters of the output channels may be set. The IP modulator is dual-channel with adjacent (upper) channel assignment of the RF output channels. When an RF channel is selected, the other RF channel will be the immediate upper neighbour channel of that selected, e.g. when channel 30 is selected, the other channel will be 31.

DVB-C RF parameters

	Constellation	Symbol rate	Step	Frequency, kHz	Channel	Attenuator	Enable
Output 1	QAM-256	6900	8 MHz	474000	C21	0	✓
Output 2	QAM-256	6900	8 MHz	482000	C22	0	✓
Select all							

Update

In this menu the DVB-C RF parameters of the output channels may be set.

"**Constellation**"
The value is independently programmable for each RF channel.
Selection: 16 QAM, 32 QAM, 64 QAM, 128 QAM or 256 QAM

"**Symbol rate**"
The symbol rate must be set the same for both output channels and are set via "Output 1".
Selection: 1 - 7.2 MSps

"**Step**"
In this column, the bandwidth of the channel may be set. This is determined via "Output 1" for both output channels.
Selection: 6 MHz, 7 MHz, 8 MHz, 8.3 MHz

"**Frequency, kHz**"
The output frequency for "Output 1" may be set in this column. The output frequency for "Output 2" will be automatically programmed as the adjacent channel above "Output 1" according to the selected bandwidth.
Selection: 45000 - 862000 kHz

"**Channel**"
Here, the channel name is stored according to the selected frequency or vice versa.
Selection: based on selected modulation type and country

"**Attenuator**"
The attenuator allows the reduction of the RF output level and can be set via "Output 1" for both output channels.
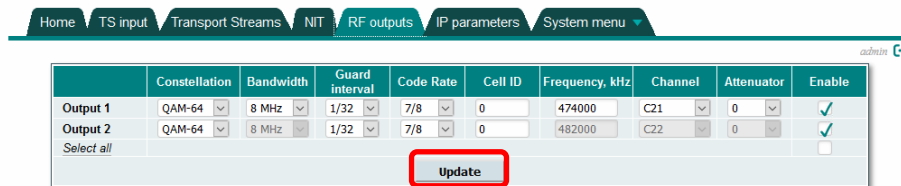Selection: 0 - 30 dB (1 dB steps)

"**Enable**"
By selecting the check box the output channel will be activated.
Selection: ✓ = Output activated   = Output deactivated

If all fields have been completed correctly, press the button "**Update**" and the data will be sent to the device.

DVB-T RF parameters

In this menu the DVB-T RF parameters of the output channels will be set.

"*Constellation*"
The value is independently programmable for each RF channel.
Selection: QPSK, 16 QAM, 64 QAM

"*Bandwidth*"
In this item, the bandwidth of the channel will be set. This is determined via "Output 1" for both output channels.
Selection: 7 MHz, 8 MHz

"*Guard interval*"
The guard interval is independently programmable for each RF channel.
Selection: 1/4, 1/8, 1/16, 1/32

"*Code Rate*"
The code rate is independently programmable for each RF channel.
Selection: 1/2, 2/3, 3/4, 5/6, 7/8

"*Cell ID*"
The cell ID is independently programmable for each RF channel. It creates a location reference and is sent to the service information.

"*Frequency, kHz*"
The output frequency for "Output 1" may be set in this column. The output frequency for "Output 2" will be automatically programmed as the adjacent channel above "Output 1" according to the selected bandwidth.
Selection: 45000 - 862000 kHz

"*Channel*"
Here the channel name is stored according to the selected frequency or vice versa.
Selection: based on selected modulation type and country

"*Attenuator*"
The attenuator allows the reduction of the RF output level and can be set via "Output 1" for both output channels.
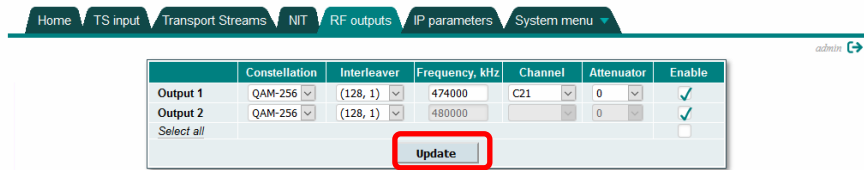Selection: 0 - 30 dB (1 dB steps)

"*Enable*"
By selecting the check box, the output channel will be activated.
Selection: ✓ = Output activated   ☐ = Output deactivated

If all fields have been completed correctly, press the button "*Update*" and the data will be sent to the device.

DVB-C Annex B RF parameters

In this menu, the DVB-C Annex B RF parameters of the output channels will be set.

"***Constellation***"
The value is independently programmable for each RF channel.
Selection: 64 QAM, 256 QAM

"***Interleaver***"
The value for the interleaver is independently programmable for each RF channel.
Selection: 128/1, 128/2, 8/16, 16/8, 32/4, 64/2

"***Frequency, kHz***"
The output frequency for "Output 1" will be set in this column. The output frequency for "Output 2" will be automatically programmed as the adjacent channel above "Output 1" according to the selected bandwidth.
Selection: 45000 - 862000 kHz

"***Channel***"
Here the channel name is stored according to the selected frequency or vice versa.
Selection: based on selected modulation type and country

"***Attenuator***"
The attenuator allows the reduction of the RF output level and can be set via "Output 1" for both output channels.
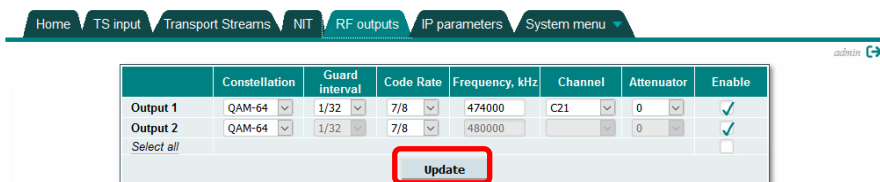Selection: 0 - 30 dB (1 dB steps)

"***Enable***"
By selecting the check box the output channel will be activated.
Selection: ✓ = Output activated   ☐ = Output deactivated

If all fields have been completed correctly, press the button "***Update***" and the data will be sent to the device.

ISDB-T RF parameters

In this menu, the ISDB-T RF parameters of the output channels will be set.

"***Constellation***"
The value is independently programmable for each RF channel.
Selection: QPSK, DPSK, 16 QAM, 64 QAM

"***Guard interval***"
The guard interval for "Output 1" will be set in this item. The same value will automatically set for "Output 2".
Selection: 1/4, 1/8, 1/16, 1/32

"*Code Rate*"
The value of the code rate is independently programmable for each RF channel.
Selection: 1/2, 2/3, 3/4, 5/6, 7/8

"*Frequency, kHz*"
The output frequency for "Output 1" will be set in this column. The output frequency for "Output 2" will be automatically programmed as the adjacent channel above "Output 1" according to the selected bandwidth.
Selection: 45000 - 862000 kHz

"*Channel*"
Here the channel name is stored according to the selected frequency or vice versa.
Selection: based on selected modulation type and country

"*Attenuator*"
The attenuator allows the reduction of the RF output level and can be set via "Output 1" for both output channels.
Selection: 0 - 30 dB (1 dB steps)

"*Enable*"
By selecting the check box the output channel will be activated.
Selection: ☑ = Output activated ☐ = Output deactivated

If all fields have been completed correctly, press the button "*Update*" and the data will be sent to the device

6.7 Menu item "IP parameters"

In the menu item "*IP parameters*", the IP address data of the Ethernet interface for the modulator may be set.
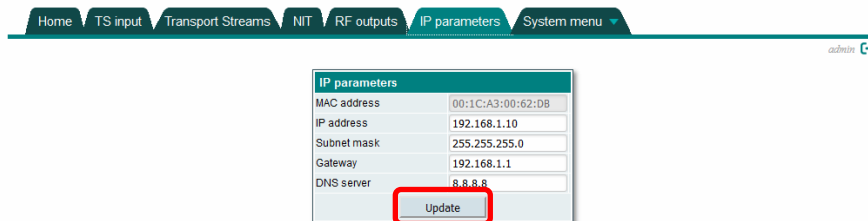
The settings of the IP address, subnet mask, gateway and DNS (Domain Name System) must be adapted to the local network. The IP parameters are updated and activated immediately after clicking the "*Update*" button.

<u>Note</u>   By pressing the "*RESET*" button for at least 3 seconds, the IP address will be reset to the default value **192.168.001.010**.

Reset button

Press for 3 seconds   =   IP address and password will be reset to factory settings, status LED will flash red and green and the device will be restarted with the default IP address and password „admin".

Press for 4 seconds   =   all parameters will be reset to factory settings, status LED flashes green, when the reset button is released, the status LED lights up red until the factory reset is done, then the device will be restarted with the factory settings.
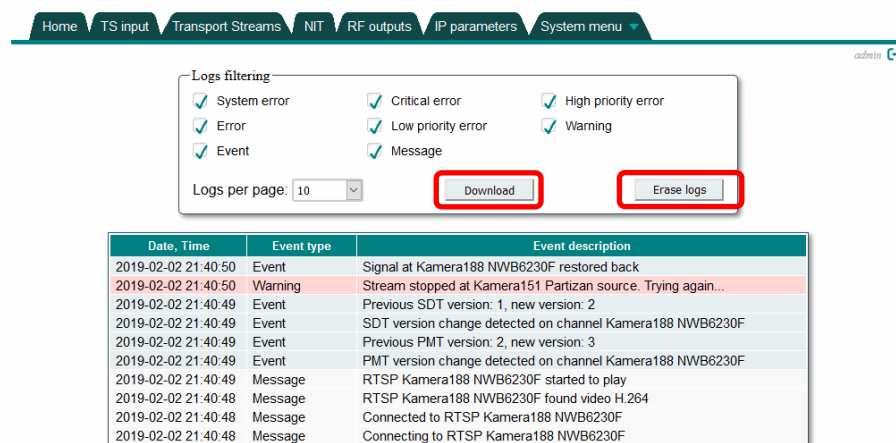
6.8 Menu item "System menu"

In the menu item "**System menu**", additional system parameters for the management of the device are provided. Depending on the type of user access, restrictions for adjustment are possible.
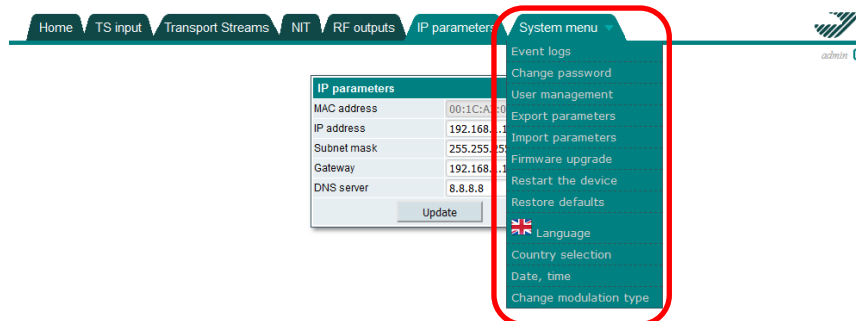
6.8.1 Menu item "Event logs"
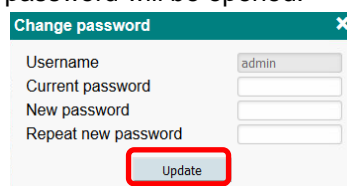Various important events, errors and warnings are logged in the system.

Each record has an event type that can be used to filter specific messages. These will be activated in the check boxes in the block "**Logs filtering**". Messages will be filtered automatically. With the button "**Erase logs**", the event logs can be deleted from the system. The "**Download**" button can be used to create a file from the event log (,,logs.json") and to be used as a supplement to the error description if support is requested. Messages will be reported only in English, regardless of language selection.

The table at the bottom of the screen shows an event log. Each record has a log time "**Date, Time**" at which the event occured. (The time is displayed in the local time of the user as determined by the web browser.) The "**Event type**" and a "**Event description**" will be displayed. The device has 8 different event types, sorted by the severity of the event. Only messages with selected event types are listed in the event log.

6.8.2 Menu item „Change password"
The currently logged in user can change his username and password. After pressing the item "**Change password**", the following window for changing the password will be opened.


Only the dedicated username "admin" cannot be changed. All other usernames can be changed in the field "**Username**". The user must enter the current password in the field "**Current password**" before a new password can be set in the following two fields. To confirm the new access data, press the button "**Update**".

6.8.3 Menu item "User management"

Only the admin user can view this menu and manage users who can access the system.
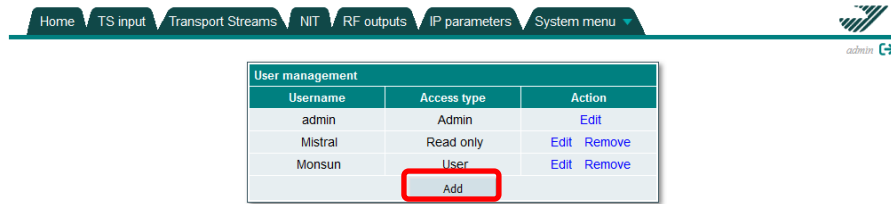
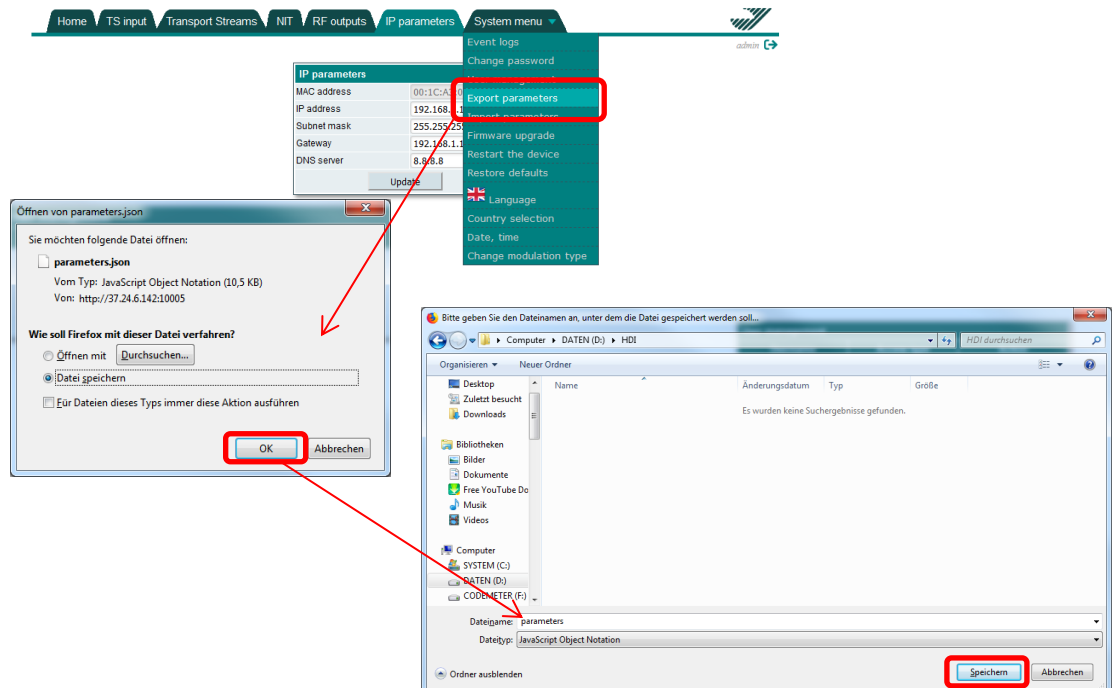After pressing the button "**Add**", the following window to enter a new user will be opened.
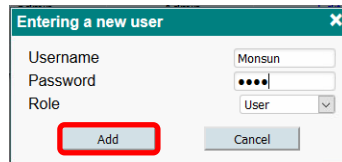
Here the "**Username**", "**Password**" and access mode "**Role**" may be defined by the administrator.

Access mode: "Admin"   → Full access to all setting options

"User"   → Restricted read and write access

"Guest"   → Read access

To accept the new users, press the "**Add**" button.

6.8.4 Menu item "Export of parameters"

Parameters of the same device type (e.g. IP into DVB-C modulator) can be imported and exported from one device to another. To do this, press the button "**Export of parameters**" in the menu "**System menu**". The selection window to save the export file will be opened.
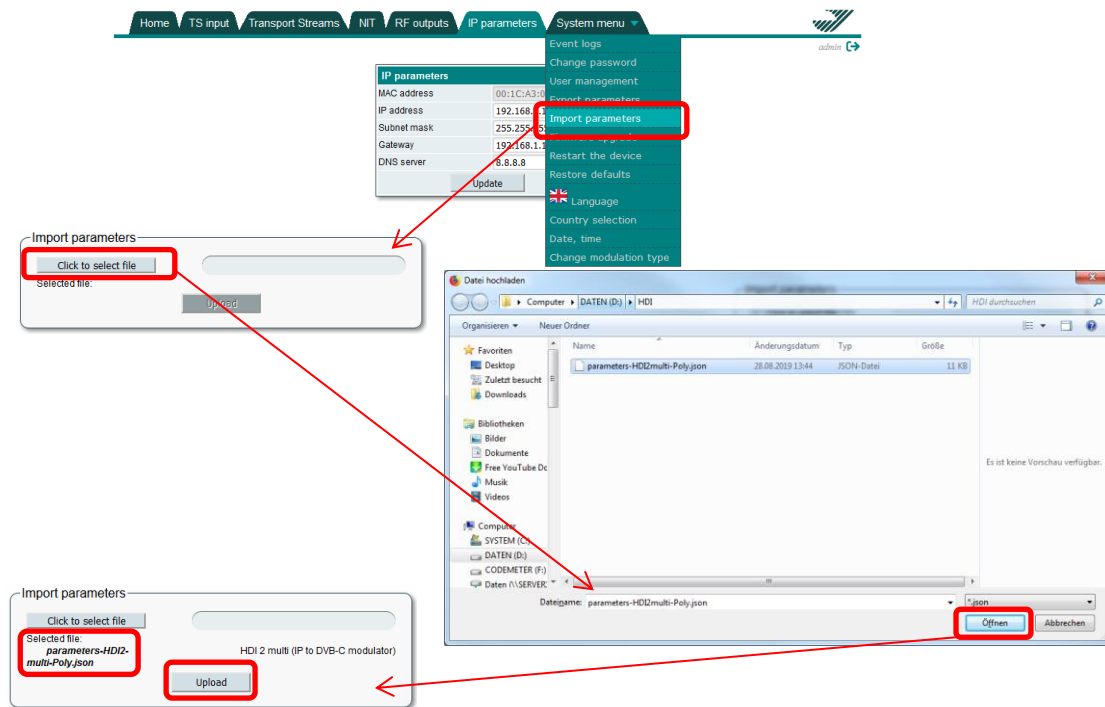

After pressing the button "**OK**", the folder structure will be opened and the storage location for the parameter file, can be selected. To finish saving, press the button "**Save**" (Speichern).

Note   Use the exported file to import parameters only to another device with the same modulation type or to the same device.

6.8.5 Menu item "Import of parameters"

Exported parameters from one HDI 2 multi can be imported into another HDI 2 multi or the same device. To do this, select the menu item "**Import of parameters**". The following window will be opened to select a file to import.


After pressing the button "**Click to select file**", the folder structure will be opened and the parameter file "xxx.json" can be selected after pressing the button "**Open**" (Öffnen). The web interface checks the content immediately after the file selection and does not allow invalid content to be imported. If the validation was successful, the device type and description are displayed on the screen from which the file was exported. Press the button "**Upload**" to send the parameters to the device.

The import of parameters from one software release to another is also allowed. New parameters or parameters that are no longer included in the version will not be imported and a warning will be displayed.

Note   Ensure that only those files are uploaded that are relevant to the application's modulation type, e.g. in a DVB-T system, only upload DVB-T files.

6.8.6 Menu item "Firmware upgrade"

Via pressing the menu item "**Firmware upgrade**" in file tab "**System menu**", the software update of the module will be possible.
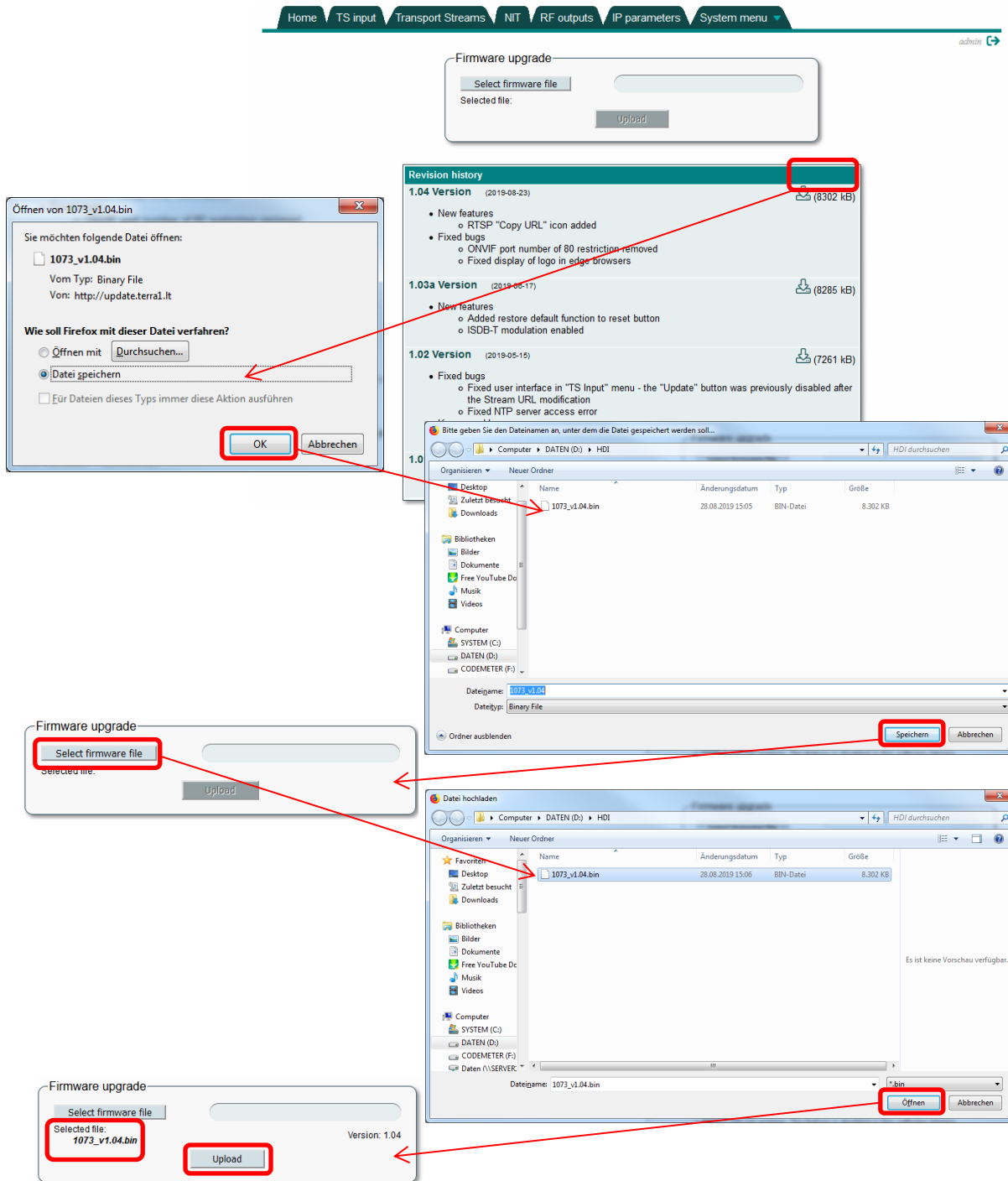

After selection of menu item "**Firmware upgrade**", the web browser searches for the latest software version. The screen displays a table listing the latest firmware versions. By pressing the "Download" icon, the firmware from the server will be downloaded to the computer. Note "**Current software version**" will be displayed if the device already has the current firmware. For each firmware version, various release notes are listed here. Notes are written in English only, regardless of language selection.

After the firmware file has been downloaded, press the button "**Select firmware file**" in the "**Firmware upgrade**" box to select the update file. If a valid firmware file has been selected, the firmware version will be displayed. Press the button "**Upload**" to send the new firmware to the device. The update status will be displayed with a progress bar.

After successful update, a confirmation message appears on the screen asking to restart device. After confirming, the status indicator (2) will start flashing red and green to indicate programming. Do not disconnect power from the

device while programming is in process. The login window will appear on the screen once the firmware upgrade is complete. The browser does not need to be updated. All device settings remain unchanged.

6.8.7 Menu item "Restart the device"
By selecting the item "**Restart the device**" in the file tab "**System menu**", the device can be restarted.
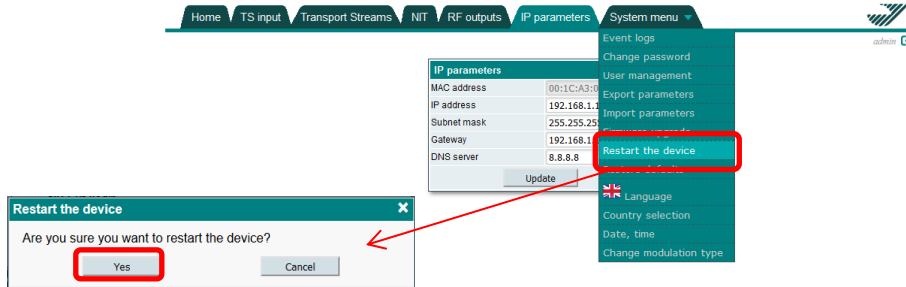
A confirmation message appears on the screen to confirm the restart. After pressing the button "**Yes**", the restart will be done. As soon as the device is ready for operation, the login window appears on the screen. The device can also be restarted by briefly pressing the reset button (6).

### 6.8.8 Menu item "Restore defaults"
By selecting the item "**Restore defaults**" in the file tab "**System menu**", all settings can be reset to the factory settings.
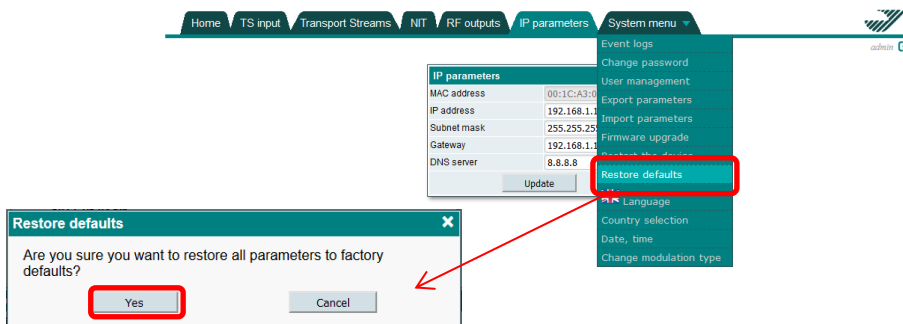
A confirmation message will be displayed on the screen to confirm loading of factory settings. After pressing the button "**Yes**", all settings will be reset to the default values and all streams and logs will be deleted.
The factory settings can also be loaded by pressing the reset button (6) for 4 seconds. This feature is available as of software version 1.03.

6.8.9 Menu item "Language"
After selecting the item "**Language**" in the tab "**System menu**", the user can select one of the predefined languages (English, German, Russian, and Lithuanian) for the user interface.
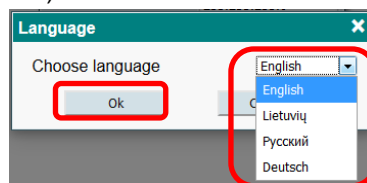
The language selection will be stored in the browser's cookies, so that different browsers or PCs can have different language choices. By pressing "**Ok**", the language setting will be accepted. After selecting the language, the browser will be updated with the selected language. There is no restart of the device necessary. All event logs will also be switched to the selected language.

6.8.10 Menu item "Country selection"

In the menu item "**Country selection**" in the file tab "**System menu**", the user can set the country location of the IP modulator and the associated time zone.
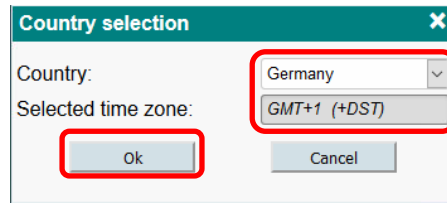
Different countries have different NIT standards, different TV channel spacing and different time zones. It is strongly recommended to specify the country in which the modulator is working. After country selection, the field "**Selected time zone**" will be automatically updated according to the selected country. If the selected country has DST (winter- / summer time switching), the GMT string will be given the mark "(+ DST)". In this case, the unit automatically switches to the winter / summer time zone and also sends this time zone via RF, so that the TV knows the time. It must be ensured that the device can access the NTP server to get the correct time. The RF channel spacing also depends on the selected country. Channel names will be updated accordingly. The original network ID is closely linked to the country. If the check box "**Automatic setting of ONIT by country selection**" is selected, the field "**Original network ID**" will be automatically updated and the NIT is regenerated with new values. By pressing the button "**OK**", the country selection will be accepted.

6.8.11 Menu item "Date, time"

In the menu item "**Date, time**" in the tab "**System menu**", the user can specify the time source for the IP modulator.
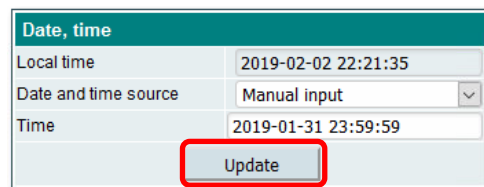

"**Local time**" shows the time taking into account possible DST conversions that the device currently has. It must be ensured that the correct country has been selected. If the time in this line is incorrect, please check the country selection. For "**Date and time source**", there are two options: "**NTP server**" and "**Manual input**". In the case of a NTP server, the URL of the server must be specified. For this, the "IP settings" must be correct and the device must be able to access the server. To accept the settings, press the button "**Update**". Thereafter, the device will connect to the server and update the line "**Local time**" providing the server can be accessed. After that, the time will be synchronized and updated every 5 minutes via the server. The option "**Manual input**" can only be used for testing, because there is no synchronization with an external source after a power failure.

It is important that the device is programmed to the correct local time. This will be sent via RF to the TV set for programming and display purposes. A TV which is receiving the wrong time may suffer an incorrect display of the EPG or other problems. Each NTP server can be used as a date/time source.

6.8.12 Menu item "Change modulation type"

In the menu item "**Change modulation type**" in the tab "**System menu**", the user can choose between four different types of modulation (DVB-C, DVB-T, QAM (Annex B), ISDB-T) for the RF output channels.
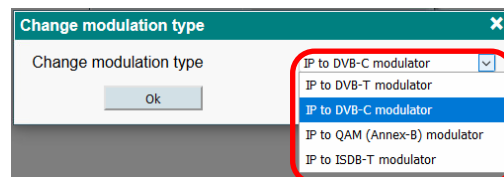
Each modulation type has a different parameter set, so importing and exporting parameters is only allowed for the same type of modulation.
After selecting the modulation type, press the button "**Ok**". The device restarts after a new login in the selected operating mode.

7. Technical data

Type	HDI 2 multi			
Article number	5741708			
Inputs	1			
IP input				
Standard	IEE802.3 10/100 BaseT			
Bit rate	<80 Mbit/s			
Protocols	UDP/RTP/RTSP			
Transport streams	MPTS/SPTS			
RF output				
Standard	**DVB-C**	**DVB-T**	**ISDB-T**	**J.83B**
Modulation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM	QPSK, 16QAM, 64QAM	QPSK, 16QAM, 64QAM, DQPSK	64QAM, 256QAM
Frequency range	96-862 MHz	174-230 MHz, 470-862 MHz		96-862 MHz
Bandwidth	1,15-8,3 MHz	7/8 MHz	6 MHz	6 MHz
Guard interval	/	1/4, 1/8, 1/16, 1/32		/
Code rate	/	1/2, 2/3, 3/4, 5/6, 7/8		/
Symbol rate	1-7,2 MSps	/		5,057/6,36 MSps
FFT	/	2K		/
MER	≥40 dB	≥35 dB		≥40 dB
Number of channels	2			
Channel allocation	Adjacent channel			
Output level	90 dBµV			
Attenuator	0-30 dB (1 dB steps)			
Connector	F female / 75 Ω			
Frequency rang loop-through input	45-862 MHz			
Through loss	≤2,5 dB			
Supported audio formats	AAC			
Management				
Standard	IEE802.3 10/100 BaseT (same as stream input)			
Operating parameters				
Supply voltage	100-240 V~, 50/60 Hz			
Power consumption	5,5 W			
Operating temperature	0 - 40 °C			
Dimensions (W x H x D)	133 x 63 x 39 mm			
Parameters external power supply				
Output voltage	+12 V ±1 V			
Output current	≥0,5 A			
Standard	according EN 55022 class B measuring with grounded load			
Protection class	Protection class II			

Notes

Technische Änderungen vorbehalten
Subject to change without prior notice