

NetUP MultiMedia Processor.
User's manual



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Overview

NetUP MultiMedia Processor

NetUP MultiMedia Processor (транскодер) is a professional software solution for encoding and transcoding video streams in real time.

 Please read the [web-interface chapter](#) for the server settings and transcoding setup.

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Supported formats and codecs

	Input stream	Output stream
Protocols:	UDP, HLS, DASH, HTTP progressive, RTP, RTSP	UDP, RTMP publish, HTTP, HLS, DASH
Multimedia containers:	MPEG-TS, MP4	MPEG-TS, MP4
Audio codecs:	AAC, MP2, MP3, AC-3	AAC, MP2, MP3
Video codecs:	MPEG-2 (H.222/H262) to 1920x1080@60p; AVC (H.264) to 1920x1080@60p; HEVC (H.265)	MPEG-2 (H.222/H262) to 1920x1080@60p; AVC (H.264) to 1920x1080@60p; HEVC (H.265)

You can use following video codec profiles for processing input streams:

- MPEG-2 (H.222/H262) – baseline, main, high;
- AVC (H.264) – baseline, main, high;
- HEVC (H.265) – main.

LCD panel

Introduction

In order to set up the NetUP's server equipped with LCD panel, do the following:

1. Plug the network and power cables into the device.
2. Switch power on. You shall see **Startup...** on the LCD panel.
3. Use the LCD manager for the initial setup of the system.

i LCD manager provides a convenient way to monitor the CPU and LAN interface load on the device front panel, as well as to assign IP addresses to network adapters.

Statistics screen

Among other items, the LCD menu contains two statistics screens. The default screen displays the network adapters traffic transfer rate. The lower line of the screen presents the total rate of input and output traffic separated by “/”.

Use **Up** and **Down** buttons to navigate through menu elements. Press **Up** to switch to the CPU load screen.



First number is the total CPU load. Three subsequent numbers give, correspondingly, the portions of CPU load related to user tasks (**u**), system tasks (**s**), and awaiting data from the peripherals (**w**). Press **Down** to return to the traffic statistics screen.

Press **Down** to navigate to the rest of menu items:

- **Reboot system** – restart server
- **Shutdown system** – shutdown server
- **Generate (Reset) password** – generate a new admin password

i **Generate password** allows to reset the administrator's password. The new administrator's password is displayed on the LCD until a key is pressed on the front panel

Set IP address and subnet mask

1. Select the Network setup screen and press **Enter** to go to settings menu.
2. Press **Up** and **Down** to select the network interface and press **Enter**.



3. If you need to **edit IP address** press **Enter** and then press **Up** or **Down** to select an octet for editing. The selected octet will be indicated by a symbol ">".
4. Select the last octet of the IP address and press **Enter** to go to **edit the subnet mask..** Press **Up** or **Down** to increase or decrease the number of mask bits. Press **Enter** to go to the save settings dialog.
5. Select **Save changes** to save the IP address and the mask and select **Discard** to cancel settings. Buttons **Up** and **Down** switch between options, with currently selected option emphasized with brackets. Press **Enter** to confirm the selection.
6. When the settings are done, set up your DNS server (via its config file) to associate the IP address just entered with `mw.iptv` domain name.

Generate new administrator's password

1. Starting from the statistic screen, press **Up** until you see the **Reset Password**.
2. Press **Enter** to generate new password and apply it to all system components. The password will be displayed on the LCD screen.

Web interface

Overview

NetUP MultiMedia Processor (transcoder server) web interface allows to edit basic server settings (network settings, administrator's password, etc.) and to manage transcoding.

To access the web interface, enter an **IP address of Middleware server** in your browser's address bar. On the opened page enter the login and the password specified in the equipment passport.

 *It is strongly recommended to change the password immediately after logging in for the first time. For more info, see **Security** on page 9*

The left panel of the web interface contains links to settings pages, pages are organized into groups. The presence of pages and groups depends on the hardware configuration of the server and the privileges of the currently logged in system user.

The web interface contains the following page groups:

Group	Page	Function
IPTV	SNMP agents	Set up SNMP, download the MIB file
System administration	Files	Download the Administrator's Guide
	Power Management	Reboot and shutdown server
	Firmware	Update firmware
	Status	Get info about the services
	Backup	Manage backup
System configuration	Network	Manage network interfaces and VLANs
	Routing	Manage user routing rules
	Security	Change the admin password
	Services	Start and stop the services
	Date and time	Select timezone and set up server time
System status	Licence	Download licenses
	About	Get info about components, license and server hardware
	Connections	Get info about NetUP.tv systems
Video stream processing	Storage	Get info about disk space usage
	Processing presets	Manage processing presets for output streams
	Processing setup	Manage input and output streams

IPTV

SNMP agents

This page contains the list of communities entitled to make SNMP requests.

The following actions are available on the page:

1. Download MIB file

Click [Download MIB-file](#) to get the .txt file. The NetUP's MIB file contains a template for the following information:

netupCpuTable	containing information about every CPU (core) in the system	
netupCpuEntry	an element that describes each row of the table and combines elements:	
	netupCpuIndex	the CPU number
	netupCpuLoad	the CPU load level
	netupCpuTemp	the CPU temperature

netupStreamerTable	containing information about every streamer in the system	
netupStreamerTableEntry	an element that describes each row of the table and combines elements:	
	adapterNumber	the adapter number
	netupBER	the bit error rate
	netupSNR	the signal to noise ratio
	netupLOCK	the signal lock status

netupStorageTable	containing information about every hard drive in the system	
netupStorageTable	an element that describes each row of the table and combines elements:	
	netupStorageIndex	the storage number
	netupStorageDevice	the path to the storage (for example, "/dev/sda1")
	netupStorageMountPoint	the mounting point of the storage (for example, "/mnt/hdd")
	netupStorageFilesystem	the file system of the storage
	netupStorageBlockSize	the block size on the storage
	netupStorageFragmentSize	the fragment size on the storage
	netupStorageSize	the storage size
	netupStorageFree	the free space on the storage

For the system as a whole:

netupMemPhisTotal	the total memory size
netupMemPhisFree	the free memory size
netupMemPhisBuffers	the buffer size
netupMemPhisCached	the cache memory size
netupMemSwapTotal	the maximum size of the swap file
netupMemSwapFree	the free space within the swap file
netupStbClients	the number of connected STB clients
netupPcClients	the number of connected PC clients
netupTotalClients	the total number of connected clients

 To request all available parameters, download the MIB file, pass it to the SNMP daemon, and run the following command: `snmpwalk -v2c -c netuptest 10.1.0.77 NETUP-MIB::netup`

2. Add an agent

Click *Add agent*, then in the opened window, fill in the fields and click *Save*.

3. Edit parameters of a community or delete it

Left-click on the community's IP address. In the opened window make changes and click *Save* to apply them or click *Delete* to remove the community.

System administration

Files

Here you can download the “NetUP.tv Administrator's Guide” in Russian or English.

Power Management

Here you can *Reboot* and *Shutdown* the server. Whenever the server needs to be reloaded or shut down, this should be done exclusively by means of these controls; abnormal termination may lead to system failure.

Firmware

This page allows to update the IPTV server firmware. This page lists the uploaded firmware files together with their uploading dates, build numbers, and possible actions. Click a firmware to open detailed information popup: **Delete** or **Install**.

Connect to the server via ftp (use login **update** and administrator's password). Refresh the page, select the uploaded file from the list and click **Install**.



Older firmware versions can be uploaded and will be shown in the list, but can't be installed

Status

The page displays:

- **Backup** – backup status;
- **Timezone** – selected timezone;
- **Licence** – license number and owner;
- **Internet** – Internet connection status;
- **Server password** – password for SSH and FTP connection;
- **Status of adapters and system components** – NetUP IPTV Core, Middleware, Billing, etc.;
- **Connections between systems** – connection presence.



Using the corresponding button, you can collect diagnostic information about the services to send it to technical support

Backup

The page contains the list of backups – `.tar.bz2` archives that contain the system settings.



The page is present only on IPTV Core servers

The following actions are available on the page:

1. Create a backup manually

Click *Create* to save an additional copy of system settings.

i Automatic backup is made every day

2. Delete, download a backup or restore system settings

Left-click on an archive. In the opened window click one of the following buttons: *Delete* – remove the archive, *Download* – load the tar.bz2 archive, *Restore backup* – apply system settings from the archive.

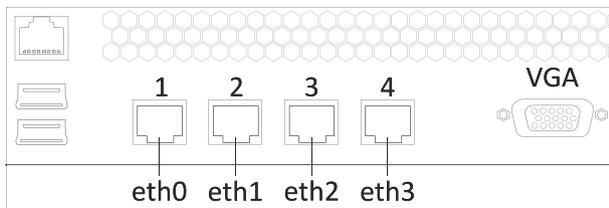
! Before restoring a backup, make sure that the backup was NOT created during the period when you used the firmware related to the another release. For more info, see the **Firmware** page (the **System** group) in the manager web interface. The release number is first two digits of the product version, for example, 2.0, 2.2, etc.

System configuration

Network

This page displays the list of all network adapters installed on the system, including virtual. Each adapter has the individual panel in the page.

The adapters in the web interface are related to the network adapters on the front panel of NetUP streamer:



i The network adapter №1 on the front panel of NetUP streamer is the eth0 in the web interface, №2 – eth1, №3 – eth2, №4 – eth3

The following actions are available on the page:

1. Create a VLAN (virtual adapter)

Click *Add VLAN*. In the opened window select the *Network interface*, that you want to use for creating a virtual one, write the *VLAN ID* and *IP address/mask*, then click *Save*.

i The VLAN name will be composed of the physical interface name and the entered ID

2. Connect to IPTV Core

Click *Change Core IP*, then in the opened window, write *IP address* and click *Save* to connect to IPTV Core. As result, in the *IPTV Core web interface*, on the *Connections* page, should appear information about the connection to this server.

i Change Core IP button is only present on non IPTV Core servers

3. Assign IP Address to Adapter

Click *Add alias* on an adapter panel. In the opened window, write *IP address/mask* and click *Save*.

i The list of all IP addresses assigned to the adapter is displayed on the adapter panel in the *Aliases* column

4. Display adapter load statistics in graphic

Click *Statistics* on an adapter panel to see the statistic.

5. Set the main interface

Left-click on the IP address (*Inet adress*) of an adapter. In the opened window check the *Main interface* box and click Save.

 *The default main interface is eth0*

6. Edit an IP-address or delete it

Left-click on the IP address (*Inet adress* or *Aliases*) you want to edit. In the opened window change the IP address and click Save. You cannot delete Main IP or the last remaining IP address of the adapter.

 *The address assigned for the main interface is used for the component's interaction and thus is absolutely crucial for the system's operation. It can never be deleted*

7. Change the IP addresses range served by the DHCP server

Left-click on the IP addresses range in the *DHCP server* column on the panel of an adapter. In the opened window specify the required range and, if necessary, add static addresses, then click *Save* to apply changes.

8. Stop or start DHCP server

Click *UP / DOWN* on the panel of an adapter. In the opened window click *OK* to switch the server.

 *The UP / DOWN button is also the DHCP server status indicator*

9. Delete a VLAN

Click *Delete VLAN* on the panel of an adapter. In the opened window click *OK* to delete the selected adapter.

Routing

This page displays *User routing rules* and *System routing table*.

The following actions are available on the page:

1. Add a user routing rule

Click *Add rule*, then in the opened window, write *IP address/mask*, *Gateway*, select *Network interface* and click *Save*.

 *Automatic backup is made every day*

2. Edit or delete a rule

Left-click on a rule. In the opened window make changes and click *Save* to apply them or click *Delete* to remove the rule.

3. Show or hide the system routing table

Click on the *Show / Hide* button.

 *The system routing table is needed for correct system operation*

Security

Use this page to change the access password.

 *Server admin password is used for SSH and FTP access*

Services

This page displays the list of the system services and their statuses (*started* or *stopped*).

 *Left-click on a service name. In the opened window click **Start** or **Stop** to switch the service*

Date and time

Use this page to set the server date and time, and select timezone. These features are only available for the IPTV Core.

The following actions are available on the page:

1. **Set time manually**

Click *Set time*, then in the opened window write *Date* and *Time*, then click *Save*.

2. **Select timezone**

Click *Select*. In the opened window, select timezone and click *Save*.

 *Set the correct timezone before uploading the license (see **Licence** on page 10), otherwise the system may work incorrectly*

3. **Add an NTP server**

Click *Add*. In the opened window write the address of an NTP server and click *Save*.

4. **Delete an NTP server**

Left-click on the address of the server you want to remove and click *Delete* in the opened window.

 *For each NTP server, you can see a synchronization status: **Filed** – the last sync attempt has failed; **SYNC** – the sync has been performed successfully; **Reserved** – this time server has not been used yet.*

Licence

This page displays information about uploaded licenses (components, numbers, expiration dates and restrictions). Use this page to upload new licenses.

 *Set the correct timezone before uploading the license (see **Date and time** on page 10)*

 *Make sure the new license is fully compatible with the old one before uploading it*

System status

About

This page keeps info about the NetUP.tv system: product and firmware versions, build numbers of individual systems, information about the license and server hardware (CPU, memory, hard drives and network interfaces).

Connections

This page displays all the systems of the NetUP.tv. Each of the systems has a separate panel. The panel displays a list of systems with which interaction is possible. Addresses of interacting systems are links.

Connections		
NetUP IPTV Core		
NetUP IPTV Relay (license 3349)	Connected	10.1.0.119
NetUP IPTV CDN Server (license 2475)	Not connected	N/A
NetUP IPTV Streamer (license 2545)	Connected	10.1.0.119
NetUP IPTV Streamer (license 2525)	Offline	10.1.0.114

The following actions are available on the page:

1. Change a system address (server host)

Left-click on the system address you want to change. In the opened window write the address manually or click *Auto detect* to detect the address automatically, then click *Apply* to save changes.

Storage

This page displays disk space usage and S.M.A.R.T. and RAID condition report.

Storage	
Storages	
/dev/sda1	
Mount point	/mnt/hdd
Size	917G
Free	429G
Usage	<input type="text" value="51%"/>
S.M.A.R.T.	OK (details)

 Click on details to see the detailed S.M.A.R.T. or RAID condition report

Video stream processing

Processing presets

Processing presets + 1			
<input style="width: 100%;" type="text" value="Search presets by name"/>			
#	Preset name	Preset parameters	Preset type
1	Test	AVC 720x576 1800 kbps AAC 128 kbps	Stream processing (AVC)
2	Pass through	-	Pass through
3	AVC SD	AVC 720x576 1800 kbps AAC 224 kbps	Stream processing (AVC)
4	HEVC SD	HEVC 720x576 1800 kbps AAC 128 kbps	Stream processing (HEVC)

The following actions are available on the page:

1. Add a preset

Click on the corresponding button on the page. In the opened window select processing parameters you want to store in the preset and click **Save**.

*Presets are classified into the following types: **Pass through** (pass the stream as is, without processing), **Stream processing AVC, HEVC or MPEG-2**. For all preset types except **Pass through**, you can configure video and audio processing parameters*

2. Find a preset

Enter the *preset name* in the search bar and the search results will be displayed on the page.

3. Edit or delete a preset

Left-click on the line with preset data you want to edit or delete. In the opened window change parameters and click **Save** or click **Delete** to remove the preset.

! You can not change the preset type

Changing parameters does not affect output streams that were configured using this processing preset. A set of preset settings is used only to quickly fill out web forms

Processing setup

Input			Output			
#	Name	Source	#	Name/Preset	Status	Destination
1	Carousel	udp://224.119.5.6:1234	42	PT	✓	.../his/relay/1488278714873...
			317	PT	✓	.../his/relay/1491296231929...
				Passthrough preset	✓	.../his/relay/1491296272505...
				Filter ID 3	✓	.../his/relay/1491296173120...
				Transmitter ID 4	✗	.../his/relay/1491296173120...
			1	Test	✗	.../adaptive/14890513711...
			5	Adaptive	✗	.../adaptive/14939992925...
80	MATCH!	udp://224.119.5.2:1234	193	PT	✓	.../his/relay/1492163003418...

The following actions are available on the page:

1. Add input

Click on the corresponding button and select one of the options – *from NetUP Streamer, from network video stream or from file*. In the opened window, fill in the fields and click **Save**. After adding the stream, you automatically get to the [Manage output streams page](#)

Connect to the server via SSH and upload the video file to /netup/playlist/ before adding a stream from the file

2. Find an input

Enter the input name in the search bar and the search results will be displayed on the page.

3. See a transcoder load

The transcoder load is displayed in the upper right part of the page.

4. Copy an input or output address

Click on the corresponding button next to a stream address. Data will be automatically copied to the clipboard.

5. See encoding parameters

Hover the mouse over an output name to show the pop-up window that contains transcoding parameters for the output.

6. See a status of an output

-  – Started
-  – Stopped
-  – Error
-  – Adaptive stream
-  – Encrypted stream

7. Stop input, delete it or edit its parameters

Left-click on the line with an *input data* to open the Manage output streams page (read the description of this page in the next section). In the upper-right corner click one of the following buttons:

- *Stop input* to stop broadcasting all output streams configured for this input;
- *Delete input* to remove the input;
- *Edit input stream* to make changes.

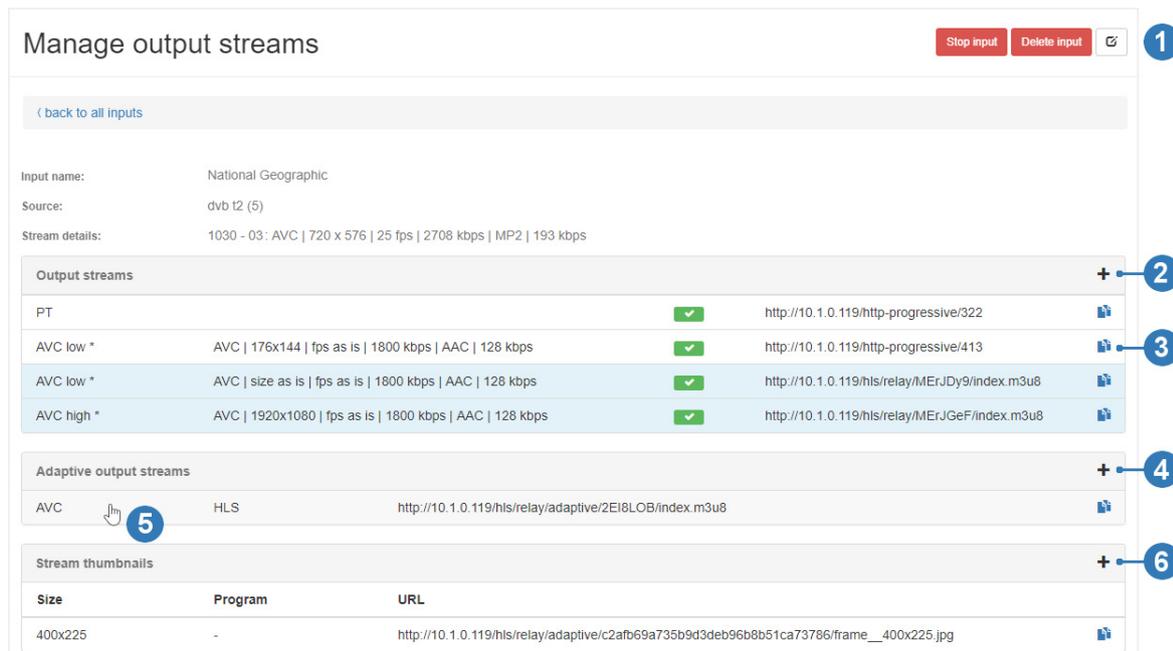
8. Manage output streams

Left-click on the line with an *output data*. In the opened window make changes and click *Save* or *Delete* to remove the output stream.

You can *Stop output stream* (excluding an adaptive). Left-click on the line with an output data and click corresponding button in the opened window.

 When the output stream is stopped, the interface displays the Start output button. Click on the button to restart broadcast

Manage output streams page



Manage output streams

Input name: National Geographic
Source: dvb t2 (5)
Stream details: 1030 - 03 : AVC | 720 x 576 | 25 fps | 2708 kbps | MP2 | 193 kbps

Output streams				+
PT			http://10.1.0.119/http-progressive/322	
AVC low *	AVC 176x144 fps as is 1800 kbps AAC 128 kbps		http://10.1.0.119/http-progressive/413	
AVC low *	AVC size as is fps as is 1800 kbps AAC 128 kbps		http://10.1.0.119/hls/relay/MERJDy9/index.m3u8	
AVC high *	AVC 1920x1080 fps as is 1800 kbps AAC 128 kbps		http://10.1.0.119/hls/relay/MERJGeF/index.m3u8	

Adaptive output streams

AVC	HLS	http://10.1.0.119/hls/relay/adaptive/2EI8LOB/index.m3u8	
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Stream thumbnails

Size	Program	URL	
400x225	-	http://10.1.0.119/hls/relay/adaptive/c2afb69a735b9d3deb96b8b51ca73786/frame__400x225.jpg	

The following actions are available on the page:

1. Stop an input, delete an input stream or edit its parameters

Click on the corresponding button on the page to stop the input. If you stop the input, the broadcast of all output streams configured for this input will also be stopped.

***i** When the input is stopped, the interface displays the Start input button. Click on the button to restart input. Restarting the input, you are restoring the broadcast of all output streams that worked before the input was stopped*

Click on the corresponding button to delete the input stream and confirm the action in the opened window. Click *Edit input stream* to change its parameters, then make changes and click *Save* in the opened window.

2. Add an output stream

Click on the corresponding button on the page. In the opened window fill in the fields and click *Save*. The new output will be displayed on the *Output streams* panel.

***i** While adding the output stream, you can change processing settings on Video and Audio tabs. These changes do not affect the preset. Video and Audio tabs are available for all the preset types, except Pass through (pass the stream as is with no processing)*

3. Copy an output stream address

Click on the corresponding button next to a stream address. Data will be automatically copied to the clipboard.

4. Add an adaptive output stream

Click on the corresponding button on the page. In the opened window select streams you want to include in the adaptive stream, then click *Save*. The new adaptive stream will be displayed on the *Adaptive output streams* panel.

***i** Before creating an adaptive stream, add the required number of output HLS streams which should be included in it. Use the corresponding button on the Output streams panel to add streams*

5. See the output streams included in an adaptive stream

Hover the mouse over an adaptive stream and the streams that are included in it will be highlighted on the *Output streams* panel.

6. Add a thumbnails stream

Click on the corresponding button on the page. In the opened window specify the Thumbnail size and click *Save*. The new thumbnails stream will be displayed on the *Stream thumbnails* panel.

***i** The thumbnails with default size are used in the NetUP Android IP STB interface. Check the Use custom size option box and select the Thumbnail size from the drop-down list or select 'Custom' and enter a resolution*

***!** Thumbnails are used in the TV channels menu, in the STB interface. If you do not add the thumbnails stream for an input, the STB menu will display a TV channel logo*

7. Edit parameters of an output, delete or stop it

Left-click on the line with an *output data* (including an adaptive and a thumbnails streams). In the opened window make changes and click *Save* or click *Delete* to remove the output stream.

You can *stop an output stream* (excluding an adaptive and a thumbnails streams). Left-click on the line with an output data and click corresponding button in the opened window.

***i** When the output stream is stopped, the interface displays the Start output button. Click on the button to restart broadcast*

Set up transcoding

1. Open the **Processing presets** page (the **Video stream processing** group) in the web interface and click **Add preset** in the upper right corner of the page.
2. In the opened window set up settings for stream processing and click **Save**.
3. Open the **Processing setup** page (the **Video stream processing** group) in the web interface and click **Add input** in the upper right corner of the page, and select a stream type.
4. In the opened window fill in the fields and click **Save**.
5. On the **Processing setup** page, find the created input stream and click on it.
6. On the opened **Manage output streams** page, on the **Output streams** panel, click **Add output**.
7. In the opened window, select the created processing preset, if it's necessary, edit video and audio setting for the stream and click **Save**.

Edit output stream

General
Video
Audio
Advanced

In:

Video: AVC | 720 x 576 | 25 fps | 2628 kbps

Audio: MP2 | 193 kbps

Out:

AVC | 720x576 | fps as is | 1800 kbps | VBR

AAC | 128 kbps

General settings

Processing preset avc

Stream type HLS

Encrypt stream

Audio tracks

Keep	Track name	PID	Codec	Channels	Bitrate
<input checked="" type="checkbox"/>	-	1082	MP2	stereo	193

Delete
Stop output
Save
Close

***i** While adding the output stream, you can change processing settings on Video and Audio tabs. These changes do not affect the preset. Video and Audio tabs are available for all the preset types, except Pass through (pass the stream as is with no processing)*



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Current version of this document is distributed together with the NetUP.tv solution and is accessible via its web interface, see **Files** page

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December 21, 2018