IPTV SD / HD Set-Top Box

MAG-200

User Guide

Precautions

Read and observe all warnings and instructions given in this manual.

- **Do not try to service or repair this product on your own.** Under no circumstances should the case be opened because it does not contain any parts to be serviced by the user. Opened product presents mortal danger if connected to power supply. In all technical questions relating to the repair and servicing of the product, please, refer to the manufacturing company or an authorized service center.

- **Do not expose the product to water and moisture to avoid ignition or electric shock.** In case of moisture ingress inside the case, immediately disconnect the product from power supply and refer to the service center for carrying out a thorough check. You must not turn on the product on any account unless the check had been carried out.

- **Do not expose the product to very high or low temperatures**. Do not place the product beside heat generating devices such as radiators, ovens, etc.

- **Do not create obstacles to air flow though air gaps and near radiators**.

- **Power cable should be laid in such manner as to avoid twisting, bending and excessive mechanical loads.** Do not pull at the supply cable when turning off the product. If the supply cable is damaged refer to the service center.

- **If you do not intend to use the product during a long period of time** (being on leave, etc.), better disconnect the power supply from the mains to avoid possible problems due to voltage jumps or lightning strokes. Always disconnect the power supply of sensitive electronic equipment from the mains during a thunderstorm.

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Contents

Purpose of the device

«MAG200» IPTV HD (high resolution) set-top box has been developed for use in hotels, holiday centers, health resorts, hospitals and in apartment houses for viewing and listening video and audio content.

The device conforms to the following standards:

- EMC Directive
- 89/336 EEC
- ДСТУ CISPR 14-1:2004
- ДСТУ 4210:2003
- ДСТУ 4211:2003
- ДСТУ EN 50106:2003
- СОУМПП29.130.20-037:2004

Climatic version УХЛ 4.2 according to state standard ГОСТ 15150.

Continuous operation of the device is provided under the following climatic conditions:

а) limiting working temperature of the ambient air from +10 to +40°C;

б) working humidity (relative humidity and temperature) from 40 to 60 % at the temperature +25°C;

в) limiting working atmospheric press from 84 to 106,7 кPa (630 – 800 mm of mercury).

You can obtain further information concerning MAG-200, as well as the electronic version of this document at the Internet address: http://iptv.infomir.com.ua/en/ip_stb.

MAG-200 main features

- Viewing HD video content
- Viewing multicast streams (TV channels) according to the list
- Manual generation of TV channels list
- Loading previously prepared list of channels according to http protocol
- TV channel preview window
- Display format conversion
- Playback of audio and video data in various formats:

  MPEG-TS, MPEG-PS, avi, mkv, mov, mp4, wmv, ac3, mp3
- Decoding video streams in the following standards:

  MPEG2, MPEG4P2, h264, VC-1, WMV9
- Decoding audio streams in the following standards:

  mpeg2-audio, mp3, AC-3
- Playback of media data from UPnP-servers
- Playback of media data from USB (flash memory)
- Capability of connecting USB–keyboard, USB–mouse
- Remote volume control and shutdown
- Low power consumption

Getting acquainted

Unpacking and placing the device

Carefully unpack the device and take all accessories out of the case.

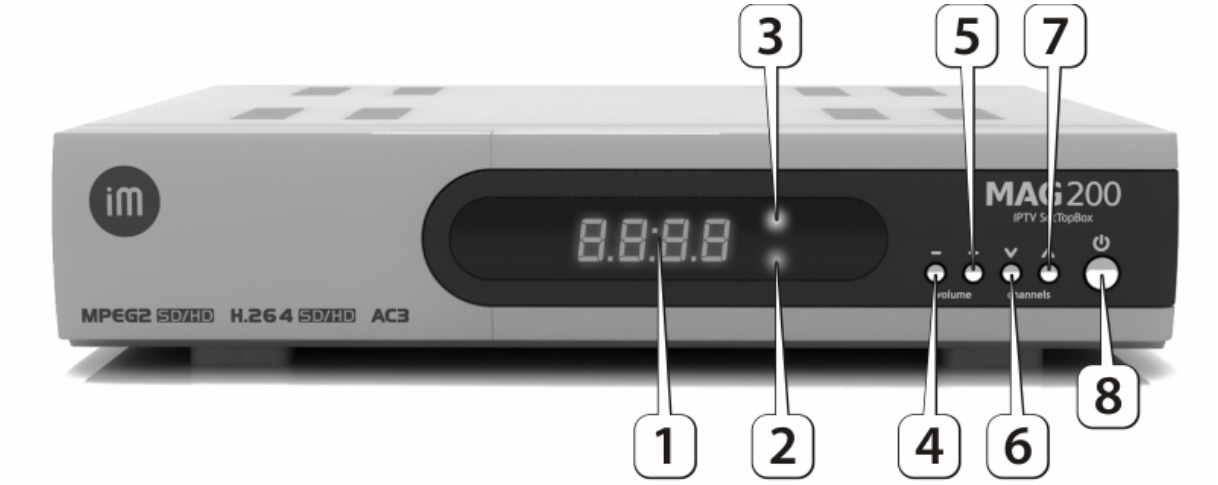
> **Please**, keep all packing materials during the whole period of guarantee. You may need them to transport the device to the manufacturer.

MAG-200 is designed for optimal operation on any stable and even surface, for example a shelf.

It should be taken into account that some space should be left behind the device for free placing of power and connecting cables. Twenty centimeters of free space is enough for laying the cables without twists and deformations.

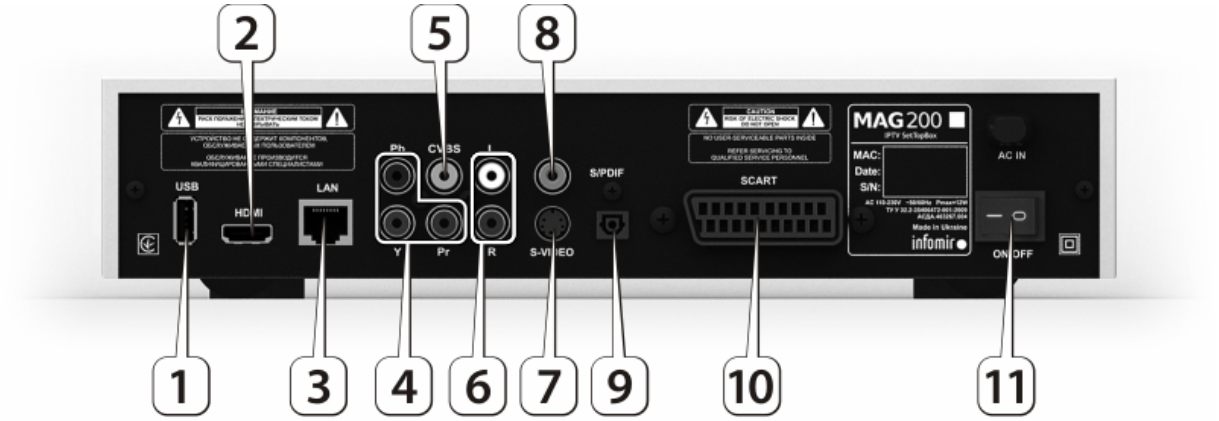
In the process of regular operation the device generates little heat. However, free space should be left above and at the sides of the device for the dissipation of heat due to air circulation. Avoid placing the device on a soft surface, which may limit the airflow (for example, on a pile carpet).

Front panel



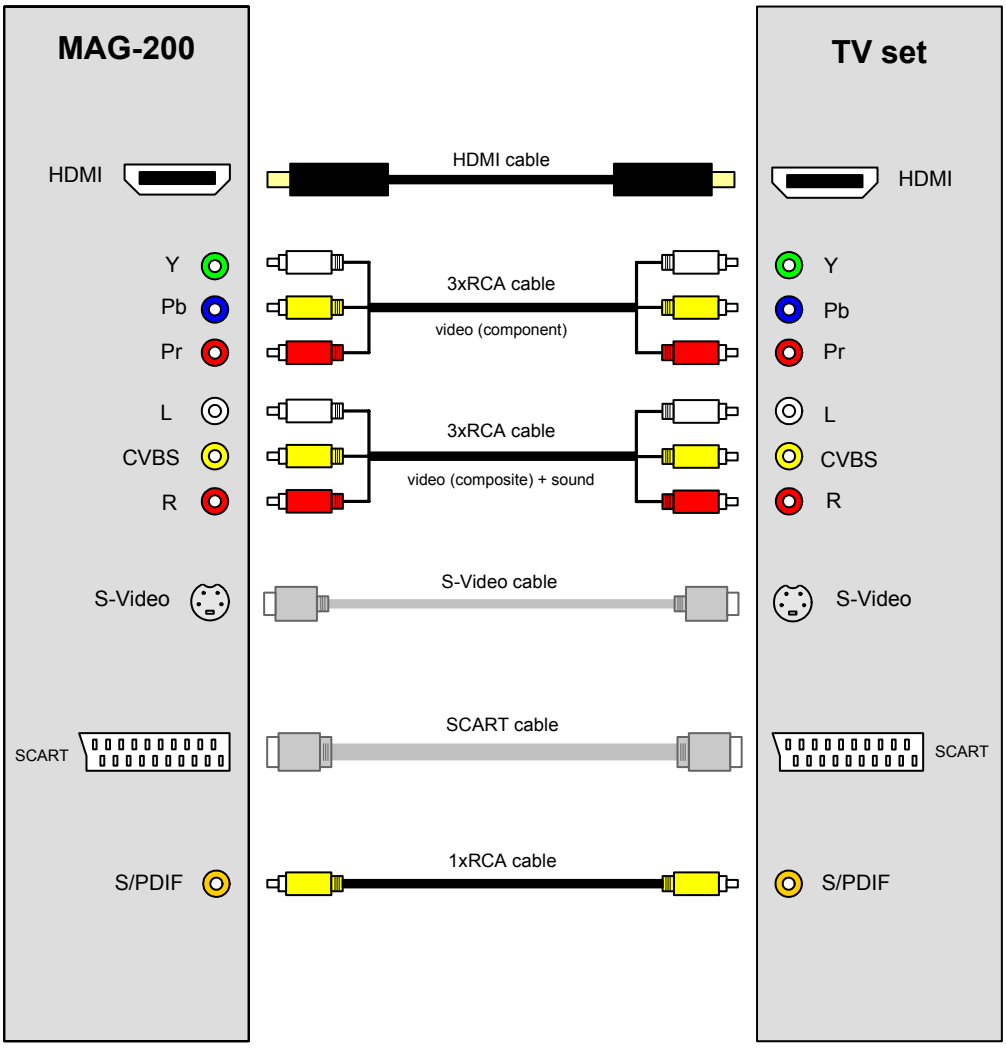
1	7-segmented LED display
2	Power indicator
3	Stand-by indicator / RC buttons pressing indicator
4	volume - Volume
5	volume + Volume
6	channels Previous channel
7	channels Next channel
8	⏻ Stand-by On/ Off

Rear panel



1	**USB** 2.0 port for keyboard, mouse, usb-memory
2	**HDMI** output for TV set or Hometheatre connection
3	Ethernet 10/100M **LAN** jack (IEEE 802.3u)
4	Component TV signal three RCA jacks for TV set or Hometheatre connection. Works in **Y-Pr-Pb** mode for HD and SD or **R-G-B** mode for SD only.
5	**CVBS** composite TV signal output. (RCA jack)
6	Linear stereo output (**L** and **R** RCA type jacks) for connecting to audio devices.
7	**S-Video** output (4-pin Mini-DIN) for connect to Tvset
8	**S/PDIF** digital interface (RCA jack) for connecting via coaxial cable to stereo amplifier, 5.1 audio system with embedded decoder or Hometheater
9	Digital optical **S/PDIF** output (TOSLINK) for connecting via optical cable to stereo amplifier, 5.1 audio system with embedded decoder or Hometheater
10	**SCART** output for connecting to Tvset or Hometheatre. Includes composite CVBS signal, YPrPb / RGB component signal and linear stereo output. RGB mode can be used for SD only.
11	Power **ON / OFF** switch.

MAG-200 connection to TV set



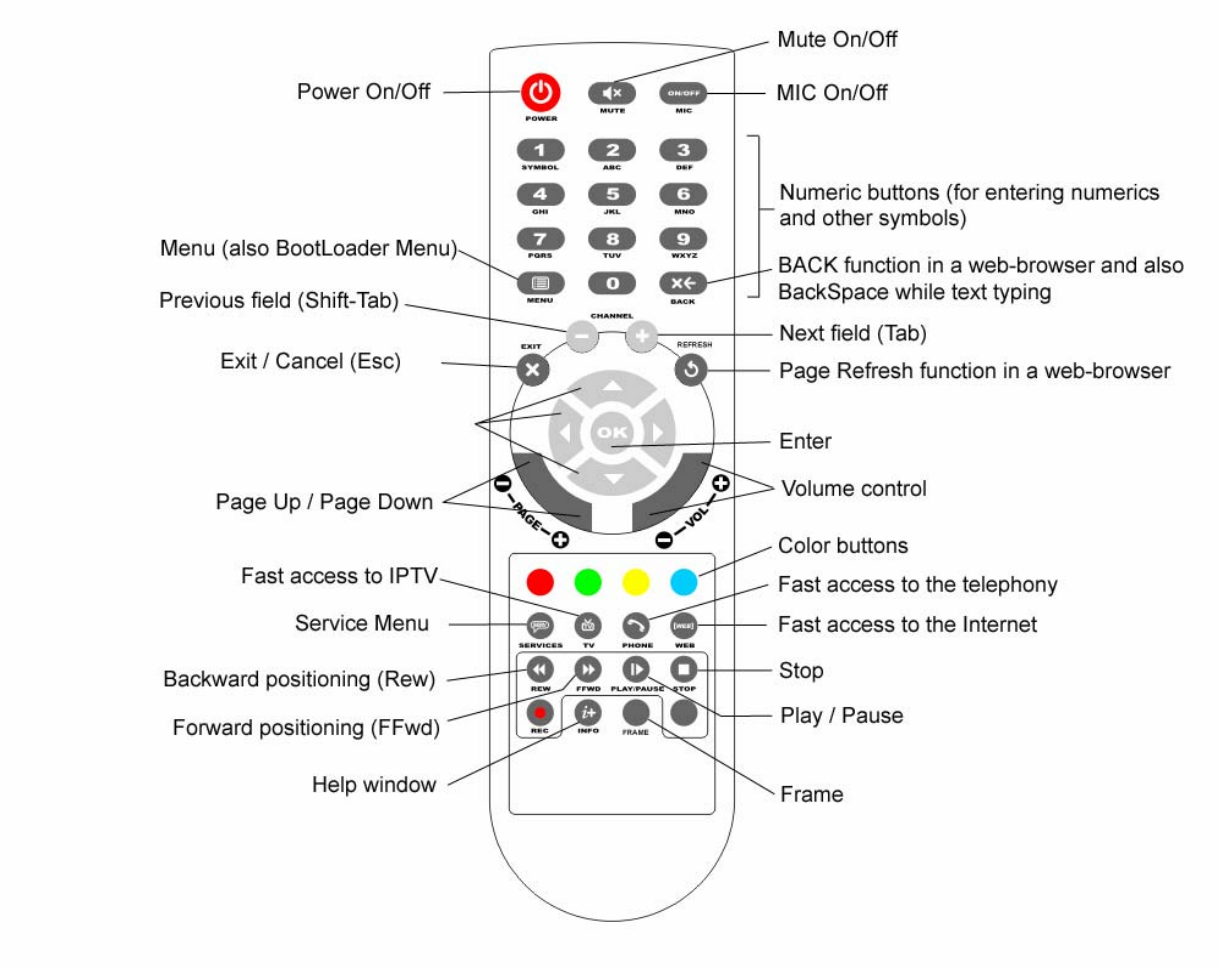
MAG-200 can be connected to TV set using one of the methods shown in the picture above. It depends on the quality of video and audio signal you wish to playback on your TV and on the availability of the corresponding cable.

Short specification of various types of connections is shown below.

Connector	Cable	Video	Audio	Remark
CVBS, L, R	3 x RCA	SD only	Analog	Composite signal
Y-Pr-Pb	3 x RCA	SD + HD	No	Component video-signal. Additional cable 2xRCA is required for connecting audio signal (L and R)
L, R	2 x RCA	No	Analog	When connecting video through Y-Pr-Pb
S-Video	S-Video	SD only	No	Otherwise called «Separate Video»
SCART	SCART	SD only	Analog	
HDMI	HDMI	SD + HD	Digital	
S/PDIF	1 x RCA	No	Digital	To music center

To make sure that the STB is correctly connected to your TV, turn it on and enter the bootstrap loader menu (see «Bootstrap menu»). The bootstrap loader menu looks like white letters on the blue background.

Remote control



Operation of the device

Bootstrap menu

The bootstrap menu is used for loading and starting basic software. Basic software contains operating and file systems and is used to provide general functioning of the device and for further loading of the operator portal or internal portal software. The portal software provides the main service for playing multimedia content to the user.

The bootstrap settings and specifications are presented and arranged in the form of a menu. The menu allows specifying the source of software loading, establishing the logo and operator key, setting graphic resolution of the TV screen, modes of the device video outputs, etc. Each item of the menu consists of two fields – the *name* of the parameter and its *value*. The bootstrap loader menu has a tree-type structure in which some menu items may contain own sub-items. In this case such item has « ▸ » instead of its value.

To enter the bootstrap menu press and keep

- «Menu» button on the remote control, or
- «ON/OFF» button at the front panel of the device

while the device is turned off and then switch on the power supply.

To exit from the menu use «Exit & Save» option for saving the changes you have made or «Exit & Discard» to quit without saving the changes.

You can navigate through the menu with remote control buttons and/or the buttons on the front panel of the device.

The buttons « ▲ » и « ▼ » on the remote control move up and down between the menu items. The button « ▸ » performs a double function. If the current menu item contains its value and this value can be changed, press the « ▸ » button makes such a change. If the current menu item contains sub-items, press the « ▸ » button enters sub-menu. The button « ◂ » is used to exit from the sub-menu backward.

The correspondence between remote control buttons and buttons on the front panel is shown in the table below.

Remote control	Front panel	Purpose
« ◂ »	**volume –**	Exit from a sub-menu
« ▸ »	**volume +**	Enter to a sub-menu item / Change a value
« ▲ »	**channels ⮝**	Move up
« ▼ »	**channels ⮟**	Move down
«OK»	**channels ⮟**	Confirm
«EXIT»	**channels ⮝**	Cancel / Exit from a sub-menu

Short description of the bootstrap loader menu is given below.

TV System	Video output mode. Possible values are: • PAL (576i) • 576p-50 • 720p-50 • 1080i-50 • NTSC (480i) • 576p-60 • 720p-60 • 1080i-60
Graphic Res	Graphic window resolution. If the preset value exceeds the video output resolution, optimal resolution is used for the graphic window. Possible values are: • 720x576 • 1280x720 • 1920x1080 • TV System Res (determined by the video outputs mode)
Component out	Component video output operation mode. Possible values are: • Y-Pr-Pb • RGB
Boot Mode	Basic software loader mode. Possible values are: • DHCP (loading from the local network) • NAND (loading from the internal flash-memory of the device)
Device Info	«Product information» menu. This menu contains the following information not to be changed by the user: • Vendor (manufacturing company) • Model • Hardware Ver. (hardware version) • Serial Number • MAC Address
Loader Info	The menu containing information on the bootstrap loader's version and the date of creation. Not to be changed by the user.
Image Info	Information on the image stored in the NAND flash-memory
Upgrade Tools	The menu for working with the software upgrading tools
Def. Settings	Reset of all variables of the bootstrap loader to the manufacturer settings. To reset settings confirm it with the command «OK» and exit from the loader menu saving the data
Exit & Save	Exit from the menu and save all changes made
Exit & Discard	Exit from the menu without saving the changes

Basic software loading

To be able to perform its functions the device must be loaded with its software (basic software). The basic software can be loaded either from internal flash-memory of the device or through the local network. The basic software loading stages are indicated on the TV screen and on the front panel indicator.

Loading from internal flash-memory of the device ("NAND")

The loading of the basic software from the NAND memory can be used for off-line playing of multi-media content. Such content may be located on the external flash-memory connected through USB port (not to be confused with internal NAND flash-memory of the device) or on a home media UPnP server.

The basic software image stored in the NAND memory is initially recorded there by the manufacturer. This image can be re-recorded and easily replaced by a new one in case of issuing a new version of the software.

To load basic software from the NAND set the parameter «Boot Mode» in the bootstrap loader to the value «NAND», and exit saving the data. For this purpose proceed as follows:

1) Make sure that the device is correctly connected to the TV and the video input on the TV set is correctly chosen
2) Enter the bootstrap loader menu (with the device switched off press and keep for several seconds the remote control button «menu» until blue screen with the menu appears).
3) Using remote control button « ▼ » move to the item «boot mode» and using « ▶ » set its value to «NAND»
4) Move to the menu item «Exit & Save»
5) Press the button « ▶ ». The message «Please confirm save change. Press OK», will appear on the screen, suggesting to press «OK» button to confirm saving the changes
6) Press «OK» button

As the result the message «Saving…» (saving the data), then «OK. Reboot…» will appear on the screen. If the mode of loading from NAND is switched on, the indication «Load from nand» appears at the bottom of the screen immediately after reloading.

Loading from local network ("DHCP")

The loading of the basic software through the local network is advantageous because in case of issuing a new version of the software it makes much easier the process of updating the image stored in the NAND memory of each device on the network.

To load basic software through the local network set the parameter «Boot Mode» in the bootstrap loader to the value «DHCP» and exit with saving the data. Proceed as follows:

1) Make sure that STB is correctly connected to the TV and correct video input is chosen on the TV set
2) Make sure that Ethernet-cable is connected to the «LAN» connector on the rear panel of the device (connector RJ-45)

3) Enter the bootstrap loader menu: when the device is turned off press and keep for several seconds the remote control button «menu» until the menu blue screen appears.
4) Using «▼» button go to the item «Boot Mode» and with the button «▶» set its value to «DHCP»
5) Move to the menu item «Exit & Save»
6) Press the button «▶». The message «Please confirm save change. Press OK» will appear on the screen
7) Confirm saving the changes with the button «OK»

As the result the screen shows the message «Saving…» and then «OK. Reboot…». The «tftp load» message appears at the bottom of the screen immediately after reloading in DHCP loading mode.

Indication the stages of basic software loading

After the device is switched on the logo (if set) appears on the screen and the indicator on the front panel shows «200». Then the bootstrap loader indicates stages of loading process simultaneously on the TV screen and on the front panel indicator.

Basic software loading stages	Front panel	Messages on the TV set screen
The Ethernet cable is not connected	«Erln»	«No link detected!!!»
Sending dhcp-request	«dHCP»	«DHCP»
Sending repeated dhcp-request with the number of attempt #	«dHCP»	«DHCP Retry#»
Dhcp-request is unsuccessful	«Er10»	«DHCP Error»
Loading the core from mtd4 partition	«nand»	«Load from nand»
Error of core loading from mtd4 partition	«Er20»	«Error loading image from nand»
Content of mtd4 partition is not valid	«Er20»	«Active partition not valid»
Loading the core/bootstrap from multicast group	«load»	«Multicast load»
Loading the core/bootstrap according to tftp protocol	«tftp»	«Tftp load»
Checking digital signature	«chec»	«Checking image»
Wrong image format	«Er30»	«Wrong image»
Wring digital signature	«Er30»	«Wrong digital signature»
Starting the core/bootstrap	«GO»	«Loading ...»

Loading the portal

After the bootstrap loader has loaded the basic software (operating system, file system, etc.), the final stage of the device loading process begins – the loading of the portal software. Portal software provides the user with the main service of playing multimedia content and other possible services.

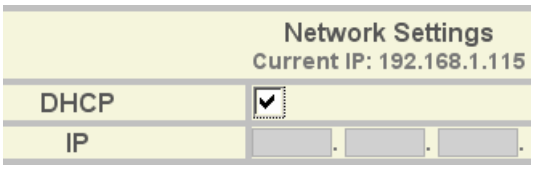
Portal software can be supplied by a company of the multimedia service operator. In addition, you can always use the «internal» portal software stored in the NAND flash memory of the device irrespective of the multimedia service operator. Internal portal is named «Service menu».

To start the internal portal you need to load the device from internal flash memory (see «Loading from internal flash-memory of the device ("NAND")») and then press «Services» button on your remote control. The «Service menu» provides IPTV service («TV channels» menu item) and «Video on Demand» service («Media Browser»).

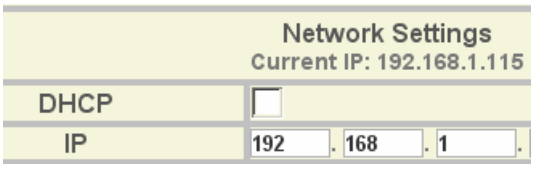
> **Note.** The "Service menu" can be also loaded within a short span of time while the device is trying to load remote portal software through the network. For this purpose press the button "Services" within 3 seconds after the message "Loading portal…" appears on the screen.

To load the operator portal proceed as follows:

1) Load the basic software from «NAND»
2) Go to the service menu
3) In the service menu select "Network Settings" item. In several seconds "Network Settings" form will appear.
4) Further network settings are performed by the multi-media service operator or by the user of the device according to the configuration data obtained from the operator (or network administrator)
   a) If the operator automatically assigns IP address, set "DHCP" checkbox using remote control buttons «OK» or «MIC(On/Off)» (use Enter key or Space bar on the keyboard). When «DHCP» checkbox is set the fields «IP», «Mask», «Gateway», «DNS» and «NTP» become inaccessible (painted with grey color):



   b) If the fields «IP», «Mask», «Gateway», «DNS» and «NTP» should be static, then «DHCP» checkbox must be reset. At that, the color of these fields turns white and they become accessible for entering appropriate data obtained from operator or local network administrator.

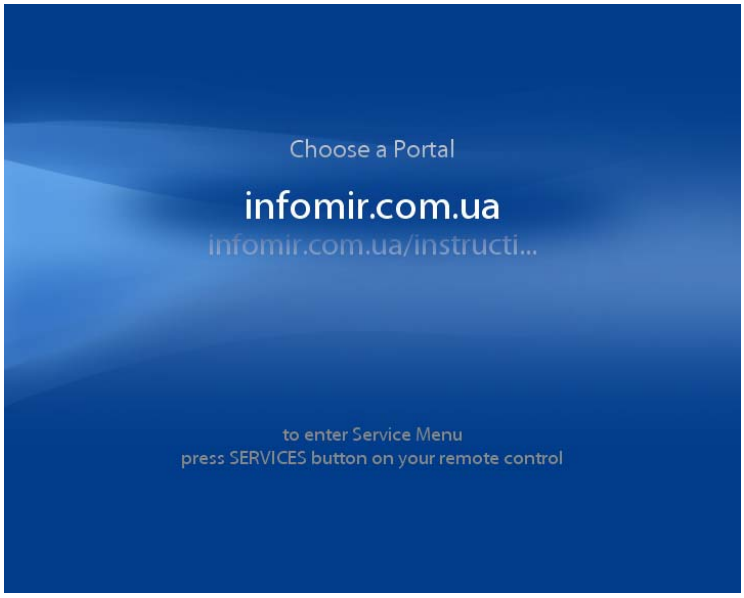


> **Note**. Refer to "Characters input" to learn how to enter characters into text fields using remote control buttons and/or standard PC-keyboard.

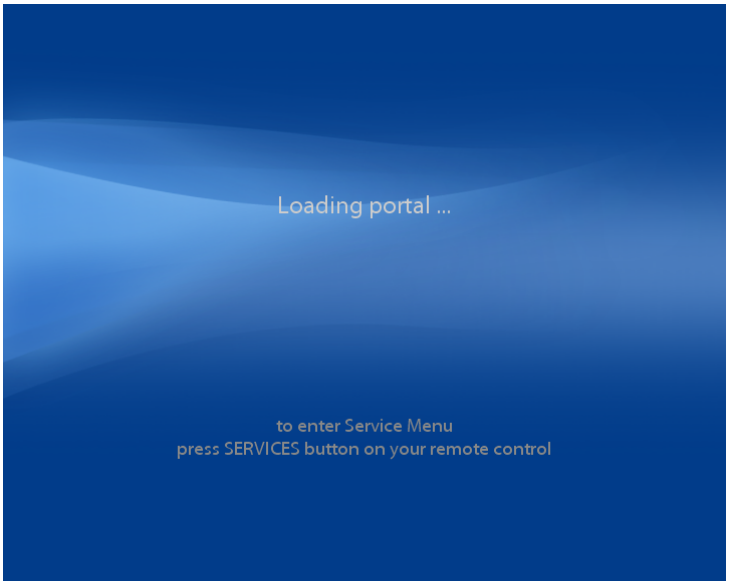
5) Then fill the fields «Portal #1 URL» and/or «Portal #2 URL» with the addresses of the operator portal according to the information obtained from the service operator.

6) Press “Save and restart” button to complete. The device will restart and new parameters will come into force. The further loading will proceed as follows.

If both «Portal #1» and «Portal #2» fields are filled, the menu “Choose a Portal” appears on the screen. This menu allows choosing a concrete portal to be loaded. From here you can also go to service menu by press «Services» button on your remote control.



If either «Portal #1» or «Portal #2» field is filled, then after the basic software is loaded, portal software will automatically start to be downloaded from corresponding address (see fig. below). At this stage you can also move to the service menu using the button «Services».



If both «Portal #1» and «Portal #2» fields are empty, the transition to Service Menu will be done automatically after the basic software has been loaded.

Service Menu

The Service Menu provides access to the main functionality of the device. It also suggests some service for working with IPTV и VoD and forms a small but quite functional portal supplied by the manufacturer with each device.

The Service Menu contains the following items:

- Network Settings
- API Demo
- TV Channels
- Media Browser

The green button in the service menu is used to restart the device.

Characters input

When working with the service menu the user may want to enter some text information, for example, a website address specification. To enter *a digit, a lowercase Latin letter* or a *special character* you may use both remote control and a standard 101-key PC keyboard connected through the USB-port.

> **Note**.
>
> When any remote control buttons are mentioned in this manual they are usually accompanied (in brackets) with the corresponding key or combination of keys on a standard keyboard, which perform identical function.

Characters input using remote control

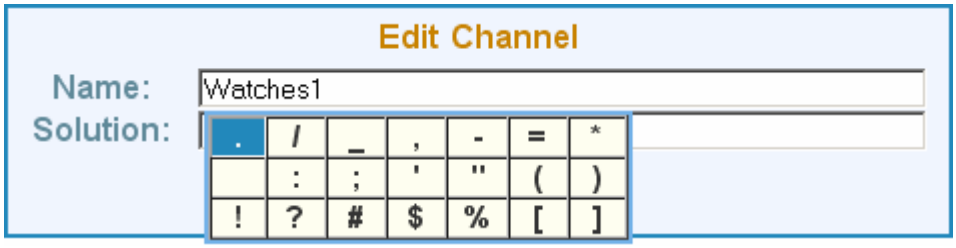
Digits, lowercase Latin letters and special characters are entered in the *virtual keyboard mode* of the device. Only the numeric buttons «1»…«9» are used in this mode.

To enter a *digit* press the corresponding button only once. If the same digit should be repeated wait for one second and press this button again. When you press different buttons no pause between them is necessary.

To enter a *letter* use the numeric button under which this letter is inscribed. In this case it may be required to press this button repeatedly to display the letter wanted. The interval between pressings should not exceed one second. At the first press the digit corresponding to this button will be displayed on the screen and after that – the letters in the succession specified. The succession is cyclic, which means that after press the last letter in the succession the digit will be displayed again, and so forth. So, if you accidentally miss the needed letter, just proceed press the button until the wanted letter appears on the screen.

For example, if you want to enter the letter «c» use the button «2» and press it four times with intervals not exceeding one second. At the first press character «2» appears on the screen, at the second press «a» appears in the same position, at the third press – «b», at the forth press - «c».

To enter *special characters* press the button «1» («SYMBOL») twice. The table of special characters will be displayed on the screen allowing you to choose the needed character.



Notice

The table does not present a complete set of special characters. It contains only those characters, which are most probably used when working with the device.

The active position highlighted with the blue color is moved with cursor buttons. The character selected is entered with «OK» button (Enter). If the active position moves to the extreme line or column, the next press of the cursor button will move it to the opposite position. The last entered character can be deleted with the «Back» button on the remote control (Backspace).

Some forms may contain the elements of choice usually called «checkbox» or «tick-box». Depending on the realization of the device software this element presents a box, which is ticked off or marked with a cross sign when it is switched ON.

To change over the state of the checkbox with remote control use the «MIC On/Off» button unless otherwise stated. This button corresponds to the SPACE bar on a standard PC-keyboard.

Characters input using standard keyboard

The use of a keyboard has a number of advantages as compared to the remote control, for example, a higher rate of typing, the capability of entering capital Latin letters, a complete set of special characters, etc.

When working with a standard keyboard you can enter all available characters. However, you should keep in mind that the device will operate in the virtual keyboard mode after turning on the power supply. It means that by default numerical keys on the keyboard operate identically to the numerical buttons of the remote control. Consequently, when you press the same numeric button with short intervals the entered digit will be replaced with a succession of letters in a cyclic manner that may become really annoying when you are typing fast.

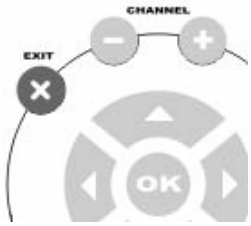
You may always switch off the «virtual keyboard» mode from the PC-keyboard and switch it on again later by using Alt-A key combination. When it is pressed the message informing you of the virtual keyboard state will appear:

Working with input forms

Data input forms are used in TV-channels mode for such procedures as editing a record, creating a new record, etc.

If the form contains several input fields one of them is always active, the rest stay inactive. The characters typed are entered into the active field. It means that this field has focus on it. Specific features of the active field are white background and black color of the characters, while the data in the inactive field are displayed in the grey color (depending on the software version).

To move focus to the next field press «Channel+» button (Tab key). To return to the previous field press «Channel–» button (Shift-Tab key).

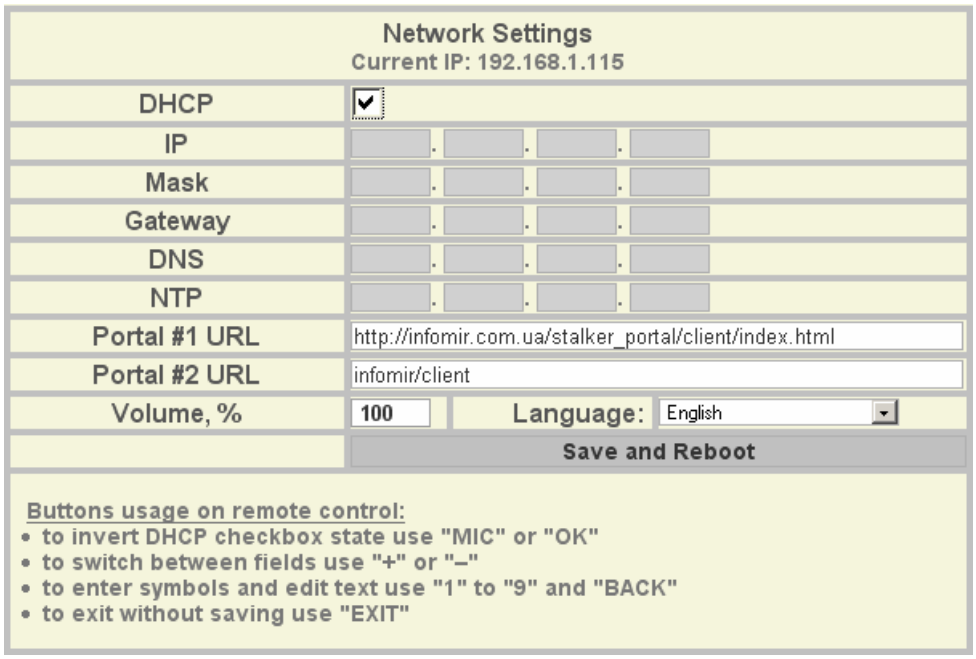


To confirm the input and activate the data entered press «OK» button (Enter). To cancel the input and delete the form from the screen press «Exit» button (Esc).

Network settings

Basic network settings of the device, as well as some other default settings are contained here. The form contains the following settings (also see «Loading the portal»):

- DHCP checkbox
- IP
- MASK
- Gateway
- DNS
- NTP
- Portal #1 URL
- Portal #2 URL
- Volume



When you change any settings in the form and want them to be saved and activated, press «Save and Reboot» button on the form. For doing so, move the focus there (the button will turn yellow, see below) and press “OK” button on the remote control. The device will reboot after 2 seconds and the changes will become valid after that.

If you want to cancel all the changes made and return to the service menu, press the button «Exit» (Esc) on the remote control.

API Demonstration

This form contains a list of the main functions of the programming interface (API) supplied by the manufacturer. This page is used exclusively to demonstrate these functions.

The functions presented are grouped in the form of two tabs – «General» (general purpose functions) and «CAS» (Conditional Access System functions).

Each function is implemented as a button. The inscription on the button represents the name of the function according to «JavaScript API specification for IPTV set-top boxes MAG100 and MAG200». The input fields to the left of a button serve for entering the parameters of this function.

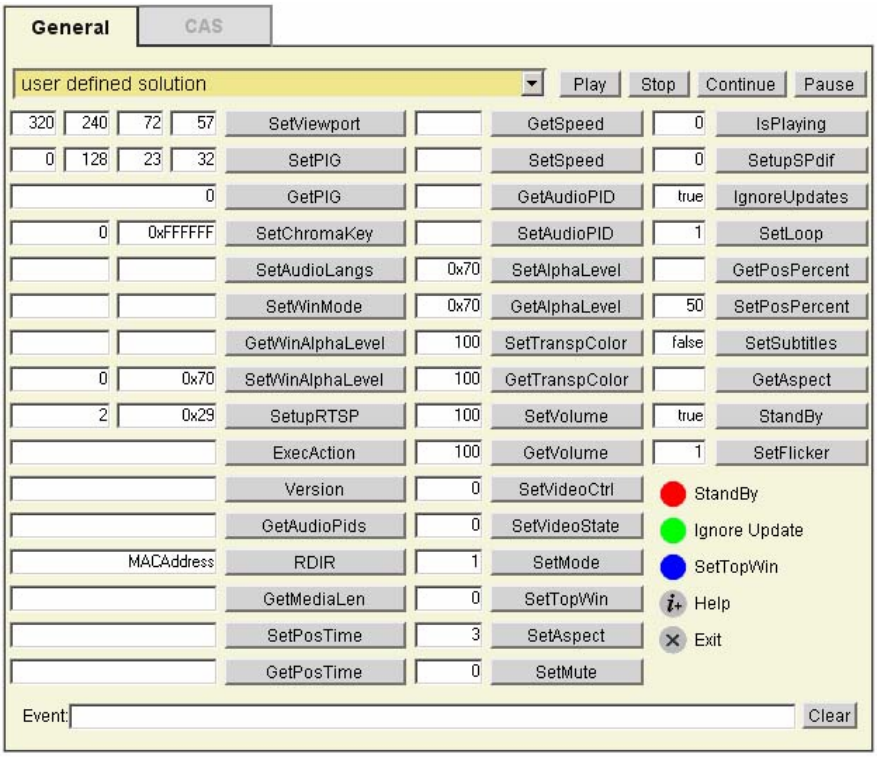
> **Note**. The latest version of the JavaScript API is always available at http://iptv.infomir.com.ua/en/ip_stb

The *StandBy*, *IgnoreUpdates* and *SetTopWin* functions can be called using simplified access with the corresponding colored buttons on the remote control.

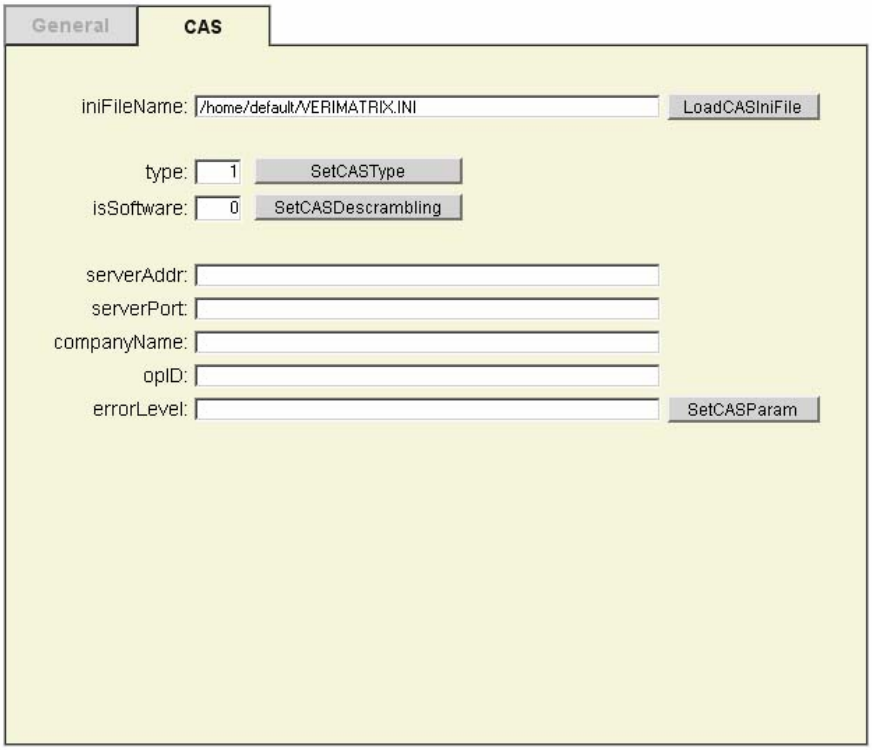
The «Help» window presenting brief information on the page is available. It is displayed with «INFO» button on the remote control.

The button «Exit» (Esc) is used for returning to the service menu.

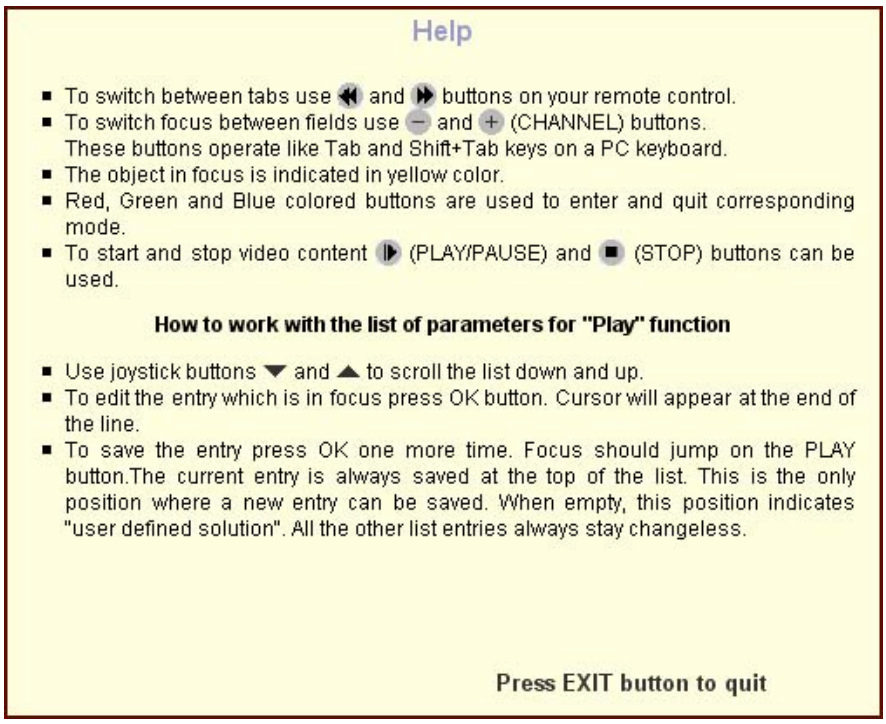
> **Attention**!
>
> It is highly recommended to avoid any changes in the «API Demo» page by a user having no special qualification or proper understanding of the purpose and parameters of these functions.



Conditional Access System functions:

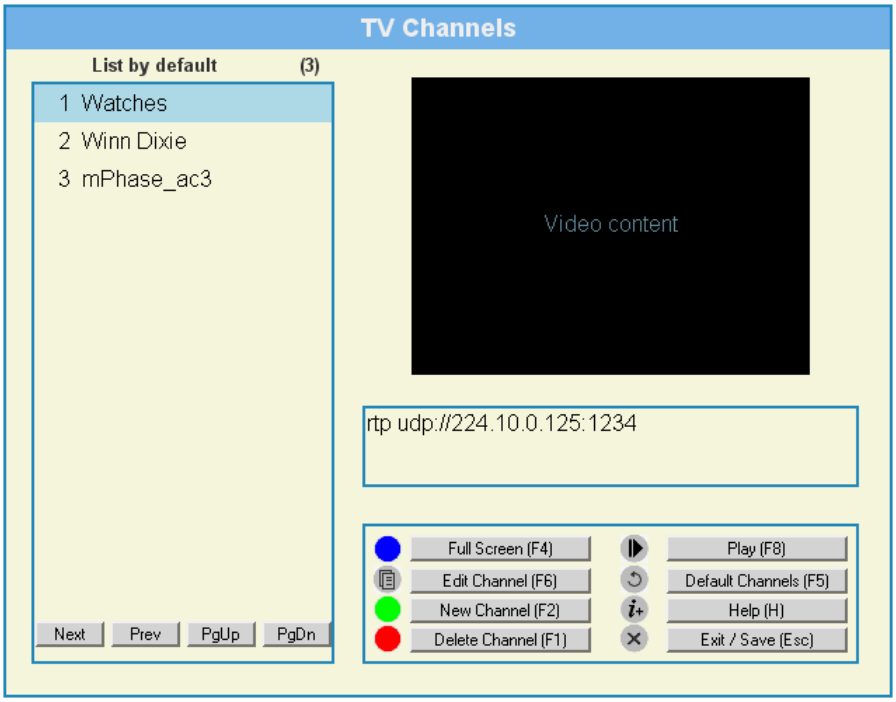


Help window:



TV Channels viewing

This form provides the user with capability of viewing IPTV video streams content. This video content will be referred to as the «TV Channel».



The form consists of the following main elements:

- TV channels list
- Parameter of the channel launching («Solution»)
- Preliminary channel viewing window
- Area with the control buttons

TV channels list

The list of available channels is displayed in a vertical rectangular field at the left part of the screen. The list contains enumerated names of the channels. The type of the field is shown above it. The number in brackets designates the total number of the channels in the list.

User can create the list of the channels manually or download predefined list from a remote server, edit it and then save the list obtained in the flash-memory of the device.

The channel lists can have different types:

- «Local list» – the list stored in the memory of this device, which appears on the screen when the user opens the page «TV Channels»
- «Default list» – the list loaded from the remote server
- «User list» – the list created by the user.

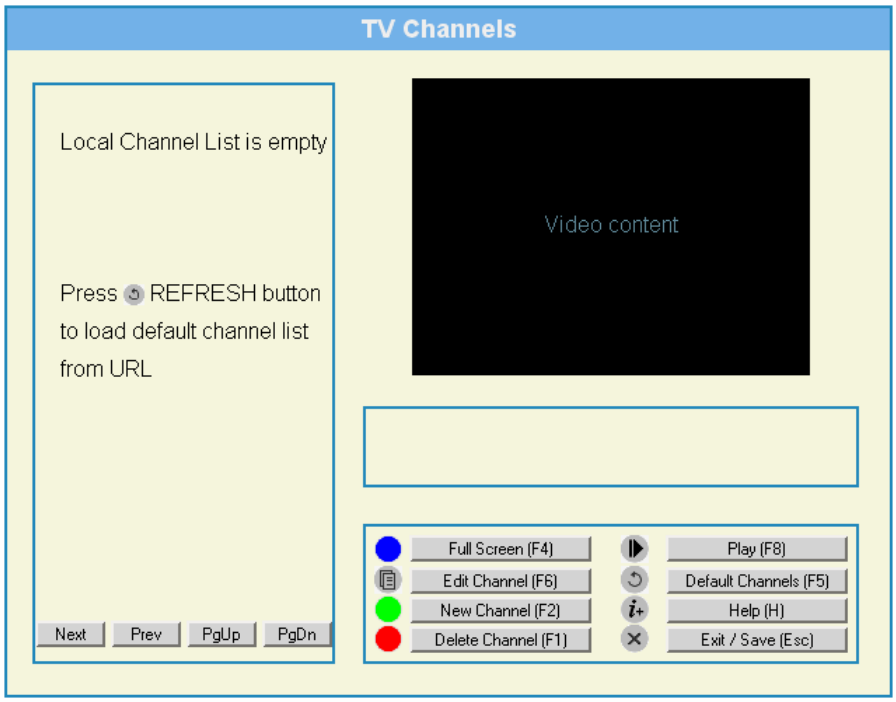
The example of a local list consisting of three channels is shown on the Figure above.

The cursor (a blue strip highlighting the current channel entry) moves along the list with cursor buttons of the remote control or, when using a mouse, – with the control buttons on the screen as follows:

- One line up: «▲» button of the remote control or «Prev» button on the screen
- One line down: «▼» button of the remote control or «Next» button on the screen
- One page up: «PAGE +» button of the remote control or «PgUp» button on the screen

- One page down: «PAGE –» button of the remote control or «PgDn» button on the screen

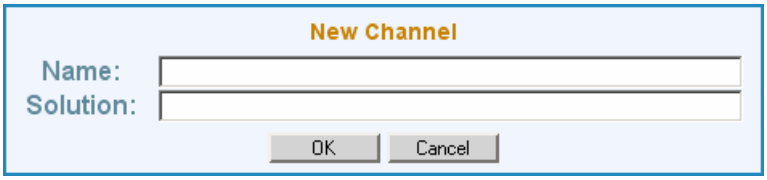
Initially, when the device is switched on for the first time the channels list is blank. The screen looks as follows:



You may create the list of channels manually or download a previously composed list from a remote server.

Manual creation of the channels list

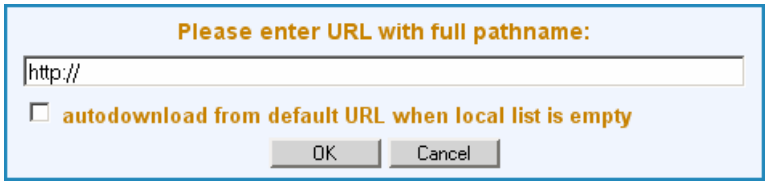
1. Press the green button (Ctrl-F2) on the remote control. The form for creating a new channel will appear:



2. Enter the name of the channel in the field «Name». Try to give reasonably short names to the channels (preferably not exceeding 20 characters). Use numeric buttons of remote control or a standard USB-keyboard for entering characters.
3. Press the button «Channel+» on the remote control (Tab) to move the focus to the «Solution» field.
4. Enter the line that provides access to the TV channel content (i.e. «solution») here.
5. Press «OK» (Enter) to confirm the input or «Exit» (Esc) to cancel. The entry created will be added to the end of the existing list of the channels.
6. If the list is empty the name «User List» will appear. The presence of the character «asterisk» means that the list was modified and you will be suggested to save the current list when exiting (returning to the Service Menu).

Loading the predefined list from the server

1. Press the button «Refresh» on the remote control (“Default Channels”, Ctrl-F5). The form for entering a remote server address will appear on the screen



2. Enter URL (full address) of the file being downloaded together with its filename extension (“txt” for the plain text document) in the input field, for example:

   `http://192.168.1.1/chanlist.txt`

3. If you want to use this address by default in case the local list is empty, turn on the checkbox «autodownload from…». To do so press the button «Channel+» (Tab) and set the checkbox with «MIC ON/OFF» button («space» on a keyboard).

4. To send a request to the server, press «OK» button on the remote control (Enter). The button «EXIT» (Esc) serves to cancel the operation

   Note. After URL entering is completed you at once may press the button «OK» (Enter). It is not necessary to move the focus to «OK» button of the form. This button is mainly intended to be used with the mouse.

5. When sending a request to the server the indicator “Wait…” will appear in the right part of the window header. If the request is successful, the file with the channel list will be loaded. In this case the «Default list» will appear in the list header and total number of channels in the list will be shown in brackets.

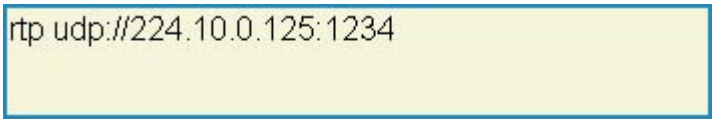
If the channels list cannot be loaded, it may be due to the following reasons:

- The file address (URL) is wrong
- No connection with the server
- No file with this name is found on the server
- The file format is incorrect

The loaded list can be modified – unwanted channels can be deleted, new channels can be added, existing records can be edited. The list obtained as the result of these operations can be saved at exiting by press the button «Exit» on the remote control (Esc). If the list was modified (an asterisk presents to the right of the list name), a dialogue window will appear suggesting to save the list in the memory of the device. The list saved becomes a «local» and will be automatically loaded from within the device upon entering the page next time.

Channel launching parameter («Solution»)

This field is located under the channel preview window. It contains the string, which defines the method (or solution) of accessing and launching the channel selected from the list (i.e. current channel):



Examples of the channel launching parameter

- Solution for the stream broadcasting:
  <**rtp**> space <**URL**>

  For example: `rtp udp://10.20.30.40:1234`

- Solution for an rtsp-server stream:
  <**rtsp**> space <**URL**>

- To playback any other type of content the following specification is generally used:
  <**auto**> space <**URL**>

Video preview window

Rectangular window named «Video» serves to preview the TV channels. Previewing helps to check whether the current solution works properly and briefly evaluate the contents of the TV channel. The preview of the current channel is activated with the button «OK» (Enter). Moving the cursor up or down the channel list while the content is being played stops current channel and starts next channel automatically.

During the playback the window can be open on the whole screen or reduced backward. This function is realized with a blue button on the remote control («Full screen», Ctrl-F4). Navigating buttons serve for moving along the channel list («Next», «Prev», «PgUp», «PgDn») and for moving to another channel when the window is expanded into full screen.

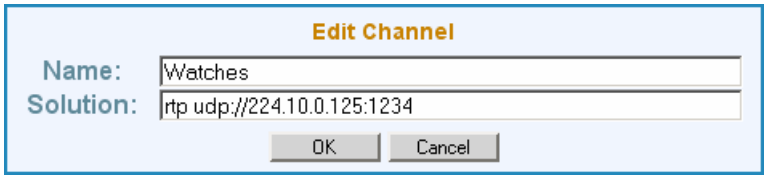
Control buttons

«Full Screen (F4)» (BLUE button on the remote control)

Opens the video window on a full screen. Repeated press performs reverse action – reduces full screen into the window. Corresponding keyboard combination: Ctrl-F4.

«Edit Channel (F6)» («FRAME» button on the remote control)

Opens the form of the entry editing. Corresponding keyboard combination: Ctrl -F6.

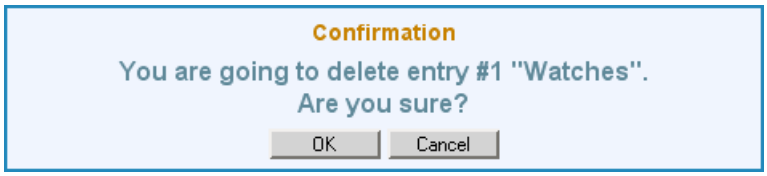


«New Channel (F2)» (GREEN button on the remote control)

Opens the form for creating a new entry in the channels list (see «Manual creation of the channels list»). New entry is added to the end of the current list. Corresponding keyboard combination: Ctrl-F2.

«Delete Channel (F1)» (RED button on the remote control)

Opens a modal dialog window to confirm the operation of deletion of the current entry from the channels list. For example, if you want to delete channel number 1 named «Watches» select it with cursor buttons UP/DOWN and press the red button on the remote control (Ctrl-F1). The following window will appear on the screen:



To confirm the deletion press «OK» button on the remote control («Enter»). To cancel the deletion press the «EXIT» button on the remote control («Esc»).

«Play (F8)» (PLAY/PAUSE button on the remote control)

The «Play (F8)» button is used to start playing video content. When the content is started, the inscription on the button and its function changes to «Stop». Also «OK» button (Enter) or «Ctrl-F8» key combination can be used to start playing.

«Stop (F9)» (STOP button on the remote control, Ctrl-F9 key)

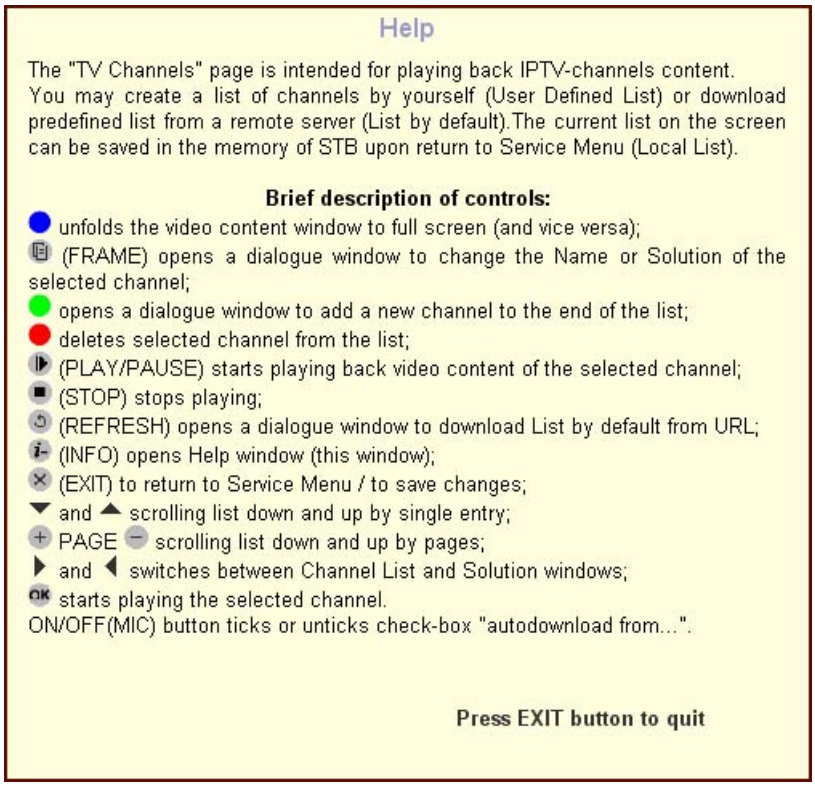
Stops the video content playing back. If the content is being played in the full screen mode, the screen will be reduced to the preview window automatically.

«Default Channels (F5)» (REFRESH button, Ctrl-F5 key)

Serves for downloading the default list of channels from a remote server. It opens the form for entering source data for sending a request to the remote server (see «Loading the predefined list from the server»).

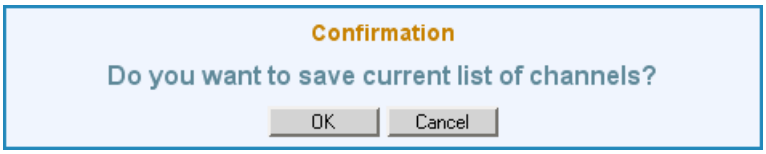
«Help (H)» (INFO button, Alt-H key)

The button «Info» displays help window containing some information on the page.



«Exit /Save» (EXIT button, Esc key)

The button «Exit» serves for completing the work in the «TV Channels» mode and returning to the service menu. If the channels list contents and/or the address (URL) of the list by default was changed, you will be suggested to save the current changes locally in the device memory before exiting:



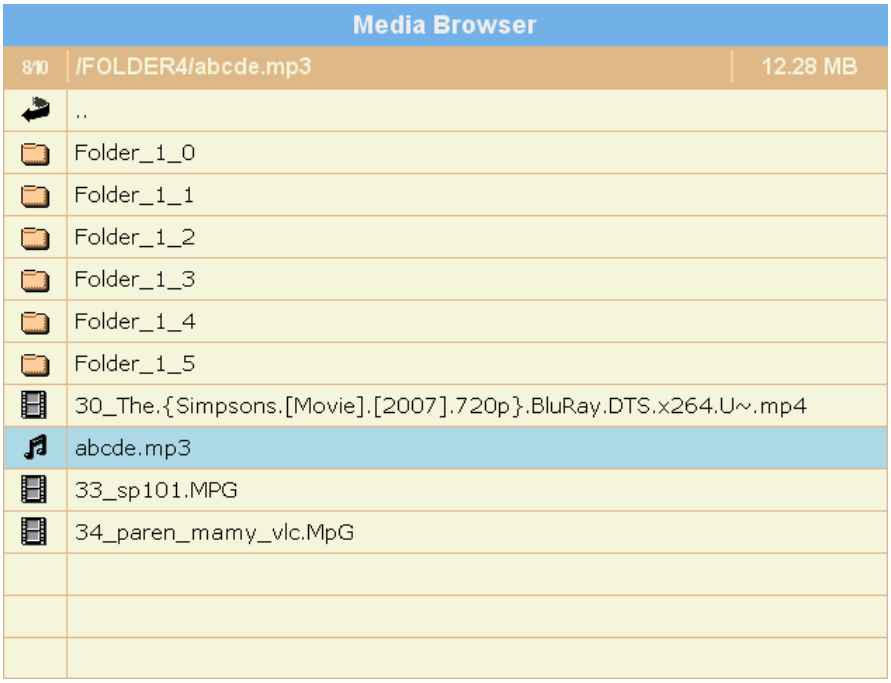
To confirm the operation press the button «OK» on the remote control (Enter). If the list is successfully saved in the device memory the corresponding message will appear on the screen.

To cancel the procedure press the button «Exit» on the remote control (Esc). In this case you will return to the service menu without saving the changes made.

Viewing media files (Media Browser)

General notes

This mode allows viewing video files and listening to audio files located on the remote media server or in the flash memory connected to the device via USB interface. All the data are represent in the form of a table with tree-type structure of folders and files.



The table header displays:

- Sequence number of the current file and total number of files in this folder. In this example – «*8/10*»
- Full pathname of the current file. In this example – «*/FOLDER4/abcde.mp3*». If the pathname length exceeds certain value it is cut off. The removed part of the pathname is replaced with a «~» (tilde) character.
- The size of the current file (folder size is not displayed). In this example the size of the file *abcde.mp3* makes *12.28* megabytes.

The table shows the files of the current folder, i.e. current level in the file tree. Each line contains an icon in the left part characterizing the type of this file.

In the current version of the media browser the following icons are used

Icon	Purpose
	Denotes a special file with the name «**..**» (two dots), which makes transition to one level upwards in the file tree
	Folder. It may contain files and/or other folders. If the folder is empty it contains at least the file «**..**» to ensure exit upward
	Video file. A file having one of the following extensions: «**mpg**», «**mov**», «**mp4**», «**avi**», «**mkv**», «**ts**», «**vob**», «**wmv**»
	Audio file. A file having one of the following extensions: «**mp3**», «**wav**», «**ac3**»

Note.

Any files having extensions different from those shown in the table above will not be displayed on the screen even if they are actually present on their medium.

To start a file or enter a folder (moving one level down on the file tree) select the corresponding line (place cursor there) and press the button «OK» (Enter). To return one level up on the file tree select a file with the name «**..**» and press the button «OK» (Enter). The current path is displayed in the table header.

The files located on the media server are usually contained in the folder «**av**» of the root folder.

If you want to play back media content stored in the flash memory (flash storage, flash-disk), connect it to the device via the USB-port on the rear panel and wait for about 7-10 seconds. The «**usbdisk**» folder will appear in the root directory, which presents a tree of files located on the external flash-memory.

If you want to disconnect flash memory you can do it at any moment even during viewing or listening to the content stored there.

Navigation along the file tree

- One position up/down – «Up»/ «Down» buttons
- One page up/down – «Page+»/«Page–» buttons (on the keyboard «PgUp»/«PgDn»)
- To the beginning of the current folder – « ◂ » button (on the keyboard: « ◂ » or «Home»)
- To the end of the current folder – « ▸ » button (on the keyboard « ▸ » or «End»)
- To the root folder – «Exit» button (Esc)
- Enter a folder – place cursor on the required folder and press the «OK» button (Enter)
- Return to the previous folder (one level up) – place cursor in the first line of the folder and press the «OK» button (Enter)
- Return to the service menu – press the «Exit» button (Esc) twice. The first press moves you to the root folder, the second press provides direct exit to the service menu.

Content playing

Positioning

To display the form of positioning when viewing or listening to the content press one of the four buttons on the remote control, called “positioning buttons” (corresponding keys on the keyboard are shown in brackets):

- « ◂ » (cursor to the left);
- « ▸ » (cursor to the right);
- «◂◂» positioning back «REW» (Alt+B);
- «▸▸» positioning forward «FFWD» (Alt+F);

The form of positioning contains the following information:

- *Time counter* in the left corner shows the precise time of the current position in the format <hour-minute-second>
- The *step* field contains the value of the positioning step in seconds
- The *total length* of the content in the right part of the form
- *Progress bar* in the lower part of the form approximately presents the current position in the content being played

Rough positioning

Rough positioning allows setting the position in the content within the value of positioning step. Positioning buttons are used for this purpose. Each press of the button changes the current position by one step. The value of the positioning step can be changed with the button “up”/”down” within the range of 5 – 900 seconds. Default value of the step is equal to 60 seconds.

The first press on the positioning button brings the content to a pause giving the possibility to the user of multiple presses the positioning buttons and/or changing the positioning step (“up”/”down”). The playing of the content resumes from the new position after press «OK» button or after approximately one second from the last press of any positioning button.

Precise positioning

Precise positioning allows setting the position in the content within one second. Time counter in the left upper corner of the form is used for precise positioning. For setting the desired value of the positioning time enter this value digit-by-digit in the following sequence “hour-minute-second”.

For example, you want to set the position in the video file being played back to the value «1:25:49», i.e. 1 hour, 25 minutes and 49 seconds. Press successively numerical buttons «1», «2», «5», «4», «9» on the remote control and then press the button “OK”.

When entering the first digit, i.e. “1”, the time counter is reset and the digit entered appears in its low-order position (see Fig. below). The content playing is suspended until the entry is completed (OK button pressed).

Each successive digit is entered in the low order position of the time counter shifting all its contents to the left. If we press the button “2” now the result will be as follows:

Then we enter the digit «5»:

Finally having pressed the buttons «4» and «9» we receive the following result:

It should be taken into account that the time counter is not a cyclic one. When the counter is completely filled it will be reset by the next digit, which will be entered in the low order position, thus allowing beginning the process again.

To complete the positioning, press «OK» button (Enter). The content will resume from the new position.

If higher digits are not present in the time being set, it is not necessary to enter zeros. For example, to set the position to the value «0:00:37» it is enough to press the buttons «3», «7» and «OK» (Enter).

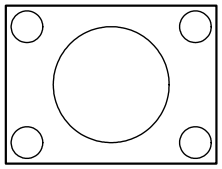
Video format conversion (Aspect Ratio)

The purpose of the video format conversion is to ensure correct presentation of video image when the ratios of the video content size and the video output do not coincide. For example, video content is viewed in the PAL system (aspect ratio 4:3), while the device video output is set to the mode 720p (aspect ratio 16:9).

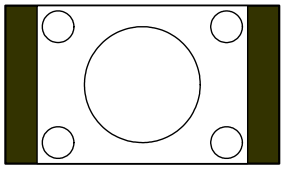
The yellow button on the remote control serves for the video format conversion. The video format conversion function operates only when video content is playing back.

The following modes of format conversion are used in MAG-200 device:

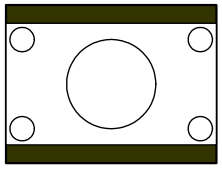
1. **«Fit on»**. In this mode video is proportionally scaled to the size of video output. If the formats of video content and video output coincide, the image occupies the whole screen completely without limitations and distortion. If the formats of video content and video output do not coincide, black horizontal or vertical fields are added..



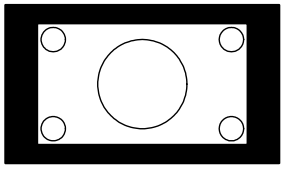
«Fit on» mode
TV screen format – 4:3
video output – PAL (4:3)
video content – 4:3



«Fit on» mode
TV screen format – 16:9
video output – PAL (4:3)
video content – 4:3



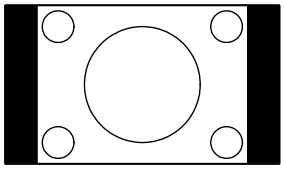
«Fit on» mode
TV screen format – 4:3
video output – PAL (4:3)
video content – 16:9



«Fit on» mode
TV screen format – 16:9
video output – PAL (4:3)
video content – 16:9

Depends on the model and current mode of your TV set

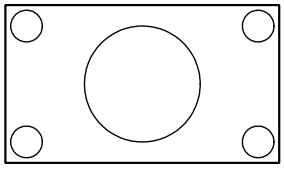
«Fit on» mode
TV screen format – 4:3
video output – HD (16:9)
video content – 4:3



«Fit on» mode
TV screen format – 16:9
video output – HD (16:9)
video content – 4:3

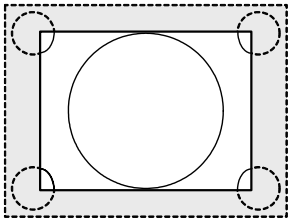
Depends on the model and current mode of your TV set

«Fit on» mode
TV screen format – 4:3
video output – HD (16:9)
video content – 16:9

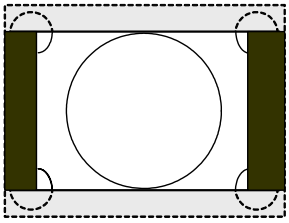


«Fit on» mode
TV screen format – 16:9
video output – HD (16:9)
video content – 16:9

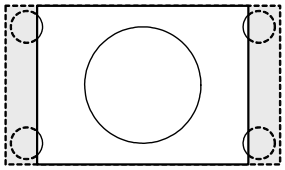
2. **«Zoom»**. In this mode video is proportionally enlarged along both coordinates by a definite factor relative to the size set by the video output mode. This results in cutting the picture, i.e. the edges of the picture extend beyond the visible zone of the screen (as shown below by grey color and dotted line).



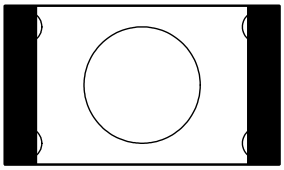
«Zoom» mode
TV screen format – 4:3
video output – PAL (4:3)
video content – 4:3



«Zoom» mode
TV screen format – 16:9
video output – PAL (4:3)
video content – 4:3



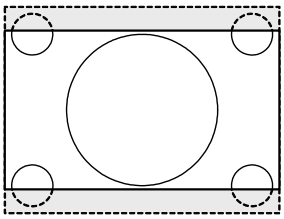
«Zoom» mode
TV screen format – 4:3
video output – PAL (4:3)
video content – 16:9



«Zoom» mode
TV screen format – 16:9
video output – PAL (4:3)
video content – 16:9

Depends on the model and current mode of your TV set

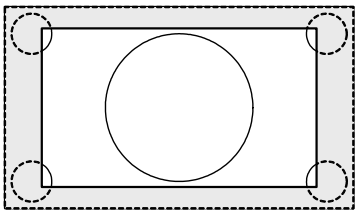
«Zoom» mode
TV screen format – 4:3
video output – HD (16:9)
video content – 4:3



«Zoom» mode
TV screen format – 16:9
video output – HD (16:9)
video content – 4:3

Depends on the model and current mode of your TV set

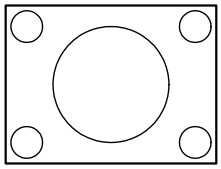
«Zoom» mode
TV screen format – 4:3
video output – HD (16:9)
video content – 16:9



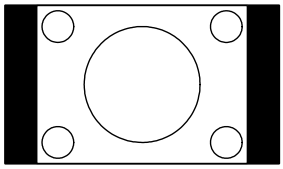
«Zoom» mode
TV screen format – 16:9
video output – HD (16:9)
video content – 16:9

3. **«Optimal»**. This mode is intermediate between the “Zoom” and “Fit on” modes, which means that video is in proportion but at the same time it is scaled in such manner that vertical fields can be cut off, while horizontal ones can be added and vice versa depending on the correspondence between video content and video output formats.

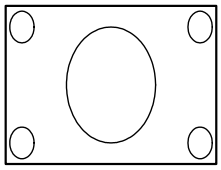
4. **«Stretch»**. If the video content and video output formats do not coincide, this mode stretches the video without observing proportions to the whole screen irrespectively of the content and video output formats. In this case the image becomes distorted. If the video content and video output formats coincide the image is not changed.



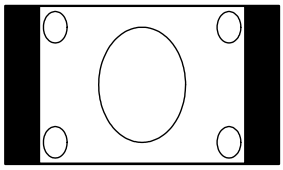
«Stretch» = «Fit on» mode
TV screen format – 4:3
video output – PAL (4:3)
video content – 4:3



«Stretch» = «Fit on» mode
TV screen format – 16:9
video output – PAL (4:3)
video content – 4:3



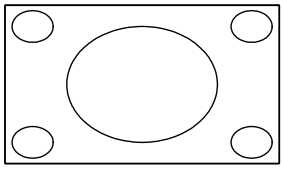
«Stretch» mode
TV screen format – 4:3
video output – PAL (4:3)
video content – 16:9



«Stretch» mode
TV screen format – 16:9
video output – PAL (4:3)
video content – 16:9

Depends on the model and current mode of your TV set

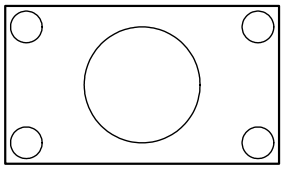
«Stretch» mode
TV screen format – 4:3
video output – HD (16:9)
video content – 4:3



«Stretch» mode
TV screen format – 16:9
video output – HD (16:9)
video content – 4:3

Depends on the model and current mode of your TV set

«Stretch» mode
TV screen format – 4:3
video output – HD (16:9)
video content – 16:9



«Stretch» = «Fit on» mode
TV screen format – 16:9
video output – HD (16:9)
video content – 16:9

Upgrade of the device software

Variants of the device basic software upgrade

There are several variants of upgrading the basic software:

1. upgrade using cyclic multicast groups;
2. upgrade using the nfs-image of the root file system;
3. upgrade from the USB-storage;
4. upgrade using fixed multicast groups

The fourth variant is the simplest of all above-mentioned variants. It is described in detail further in the text.

The first three variants are shortly described as to their realization and specifics. More detailed information and description of utilities used in these variants can be found at the address http://iptv.infomir.com.ua/en/ip_stb.

1. Upgrade using cyclic multicast groups

This variant provides software upgrade for a large number of devices simultaneously.

The server side is configured for broadcasting two multicast groups, the first of which broadcasts Bootstrap, and the second – the image prepared by the manufacturer or communication operator. DHCP server is configured in such manner that it can recognize different stages of the device loading by various `vendor-class-identifier` and return the data required for the process of software upgrade at each stage of loading.

The device is transferred to the mode of loading from «DHCP». This can be achieved either from the bootstrap loader menu or on the command of communication operator including via JavaScript API.

Then the device will load and start Bootstrap, which receives the image of the basic software and saves it in the flash-memory of the device. After flashing (writing data to flash-memory) is completed the device is restarted in the mode of loading from «NAND».

2. Upgrade from USB-storage

This upgrading method is quite simple but it cannot be used if there is a probability that the basic software does not function correctly.

The directory containing necessary utilities and images is created in the USB-storage. The USB-storage is connected to the device. Using ssh-client one enters the device and runs utilities, which help to upgrade the basic software.

3. Upgrade using the nfs-Image of the root file system

The following preparations should be done on the server side:

- tftp–server which gives the core;
- nfs-server with prepared root file system;
- dhcp-server which gives the address of the core and the root file system on request.

The device is put into loading from «DHCP» mode, and the software is loaded. Then the same actions are performed as described in the variant of «Upgrade from USB-storage». In

this variant new images and utilities can be placed in a separate directory of the root file system.

4. Upgrade using fixed multicast groups

In this variant the utility `mcast` (Linux) or `mcast.exe` (Windows) is used for organizing the process of upgrading. This utility provides broadcasting of two multicast groups simultaneously. The *Bootstrap* is broadcast in the first group at the address `224.50.0.50:9000`. The *imageupdate* prepared by the manufacturer or communication operator is broadcast in the second group at the address `224.50.0.51:9001`. The «MC Upgrade» function is started in the bootstrap loader menu, which initiates receiving *Bootstrap* from the group `224.50.0.50:9000`. After loading, *Bootstrap* in its turn receives the main image of *imageupdate* from the address `224.50.0.51:9001`. After reception is completed the image received is being checked for correctness. Providing everything is correct the image is being written into the flash-memory of the device.

Thus, if Windows is used, the whole process is performed practically automatically. It is enough to load the files *mcast.exe*, *Bootstrap* and *imageupdate* to the computer acting as the server, activate mcast.exe utility and having selected the item of the bootstrap loader menu «Upgrade Tools» > «MC Upgrade» initiate the automatic upgrade procedure on the device.

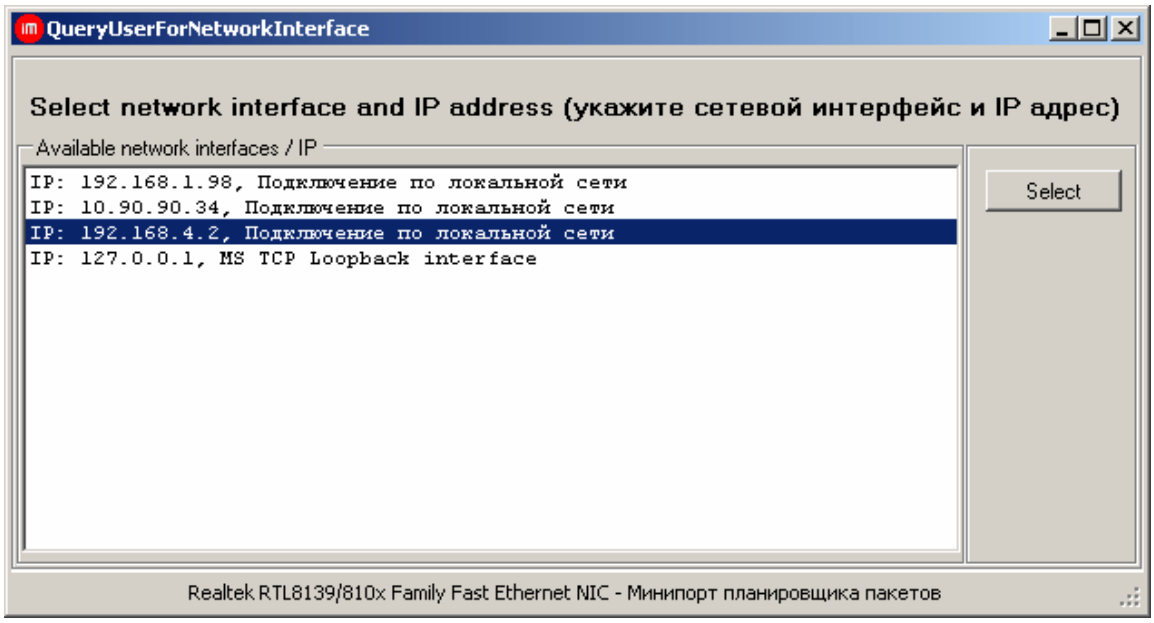
Notes.

- To operate *mcast.exe* utility install Microsoft .Net Framework Version 2.0 Redistributable Package on the computer (see «Requirements to operating system»).
- The mcast.exe utility as well as the latest version of the basic software update image from the device manufacturer can be loaded at the manufacturer site http://iptv.infomir.com.ua/fw/upgrade/. To load the necessary file click the left button of the mouse and enter the path for saving in the interactive window. It is preferable to save all the files: *Bootstrap*, *imageupdate* and *mcast.exe* in the same directory.

Description of mcast.exe utility

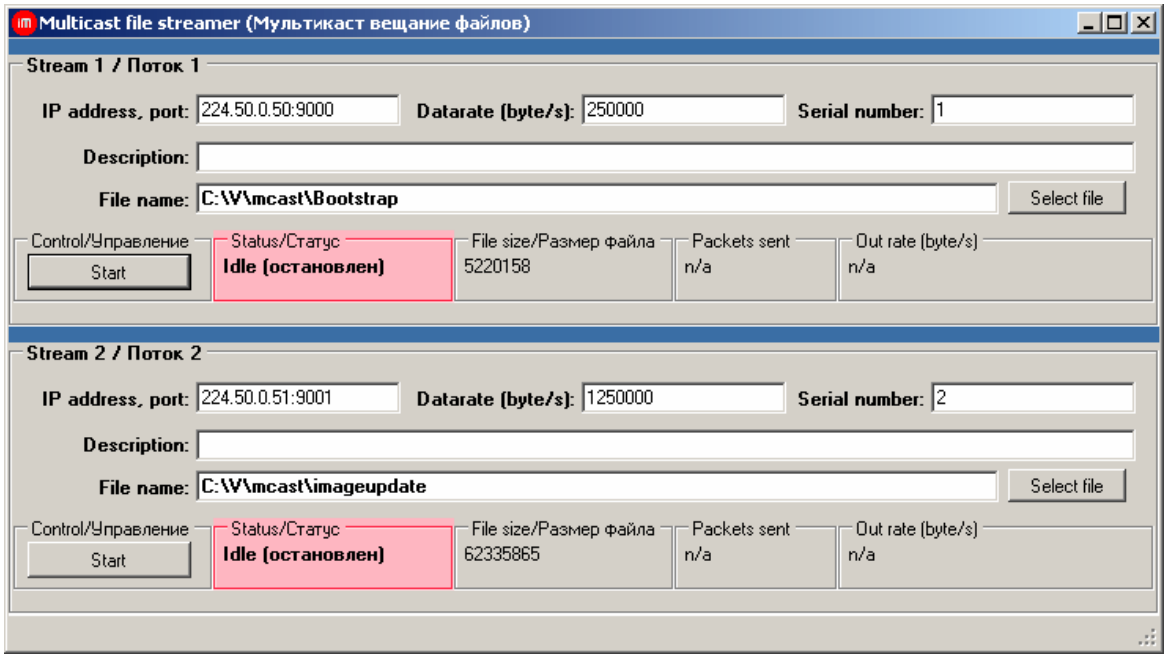
This utility allows simultaneous multicast broadcasting of up to two files.

After starting the application the modal dialogue of IP-address and network interface is opened.



When broadcasting multicast traffic it is important to make a correct choice of the network interface (Ethernet card) and IP address from which the messages will be sent. Be careful when choosing these data. Detailed information on the chosen interface, including the name of the Ethernet card, is displayed in the bottom line of the window.

After the network interface and IP address is chosen the user will enter the main screen of the application.



This form provides the user with possibility of setting necessary parameters and activating the broadcast procedure for two independent multicast streams.

After starting, the application automatically scans the working directory (the folder from which the application was started or one defined to be working for the application) and in case of detecting the files with the names *Bootstrap* and *imageupdate* automatically fills in the required fields of the form.

The settings include:

- «IP address»
- Stream «port» with a colon after the IP-address
- Broadcasting «Datarate» of the stream in bytes per second
- «Serial number»
- «Description» of the file being broadcast
- Full pathname («File name»)

Note. The dialogue of choosing the file is opened by a double click of the mouse on the field «File name» or when press the button «Select file».

The stream is controlled using the button «Start»/«Stop».

If you exit from the application all the streams being broadcast will stop.

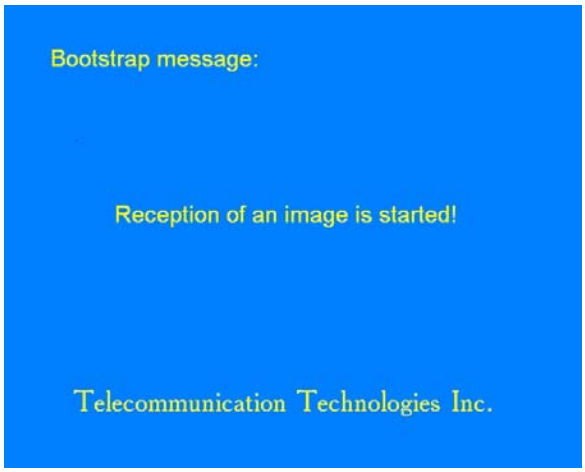
The procedure of changing firmware for MAG200

1. Prepare all the files required. Proceed as follows
   - Visit http://iptv.infomir.com.ua/fw/upgrade/
   - Load the files Bootstrap, imageupdate and mcast.exe to the same folder
2. Start mcast.exe. The Windows may ask you to install Microsoft .Net Framework Version 2.0 Redistributable Package first. Install this application (see «Requirements to operating system») and then run mcast.exe again.
3. After starting mcast.exe select network interface through which the files *Bootstrap* and *imageupdate* will be broadcast.
4. If the files *Bootstrap* and *imageupdate* are stored in the same folder with *mcast.exe*, you can go to the step 5. Otherwise, you will have to specify the path to these files in the main form of the application. The path to the file Bootstrap is set in the field «File name» of the section «Stream 1». Use the button «Select file» or enter the path manually. Similarly set the path to the file *imageupdate* in the section «Stream 2». The values of other settings can retain default values.
5. Start broadcasting both streams by press the button «Start» in both sections.
6. Enter bootstrap loader menu of the device. Proceed as follows:
   - Turn off the device using the switch on its rear panel.
   - Press and keep the button «menu» on the remote control or the button «On/Off» on the front panel.
   - Turn on the device and continue keeping the «menu» button until the bootstrap loader menu appears on the screen (within 2–3 seconds).
   - After the menu appears on the screen release the button.
7. Select menu item «Upgrade Tools» («▸» button) and then «MC Upgrade» («▸» again). If everything was performed correctly the device goes to the mode of basic software automatic upgrade.

Basic software upgrade stages on the device

- Starting the device in «DHCP» mode.
- Bootstrap loading from a multicast group or fttp.
- Checking Bootstrap digital signature.
- Starting Bootstrap. Further process of loading the software image by the Bootstrap is accompanied with displaying corresponding messages on the TV screen. Initial screen after starting Bootstrap is:

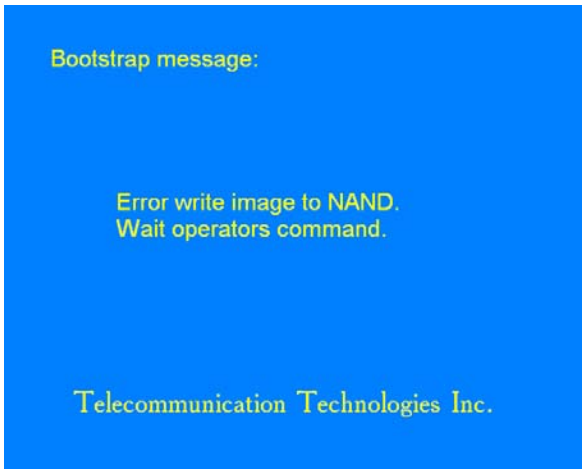
- Starting of the image reception by the Bootstrap:



- Checking the digital signature of the image received.
- If the check of the digital signature was successfully completed, Bootstrap begins writing the image into the NAND flash memory:

- If the image was successfully written to the NAND, the following screen is displayed:

If writing to the NAND was not successful the following message is displayed:



Requirements to operating system

Any version of the Windows operating system supporting .NET Framework of version 2 and higher : Windows XP, Windows Vista, Windows 7 and others load Microsoft .NET Framework Version 2.0 Redistributable Package

from the Internet address:

http://www.microsoft.com/downloads/details.aspx?FamilyID=0856eacb-4362-4b0d-8edd-aab15c5e04f5&displayLang=en

Troubleshooting

If any problem connected with your device should arise, check whether it is described in this list. If so, try to implement the measures suggested. If neither method helps you to solve the problem contact your operator of multimedia service or refer to the manufacturer.

The red LED on the front panel is not on

Trouble	Measures to be taken
The device is turned off	Turn the power supply switch on the rear panel to the position “On”
No voltage in the mains or the voltage does not correspond to the rated value	Use an operable socket with the voltage ~100-240V / 50-60Hz
The power supply cable of the device out of order	Refer to the service center or the manufacturing factory
Internal failure	Refer to the manufacturing factory

The red LED is on but there is no image on the TV screen

Trouble	Measures
TV is not connected to the device or is switched off	Connect TV to the device (see «MAG-200 connection to TV set») and switch it on
Device is connected to the TV incorrectly	Check the correctness of connection between the device and TV set according to one of the recommended schemes (see «MAG-200 connection to TV set»)
Electrical connection is correct, but required video input (source) is not selected on the TV	TV sets usually have several video inputs. To activate appropriate video input use the corresponding menu of your TV set.
The «AV» mode is not activated on the TV. The TV set does not receive the signal from the external source.	Switch the source of the signal on your TV from television reception to “AV”
The device began loading an operator portal from the local network but the portal does not load	• Check the local network connection • Refer to the technical support service of your media-service operator • Use loading from within the device. See «Loading from internal flash-memory of the device (“NAND”)»

«Данный видео выход не работает в HD режиме...» («This video output does not operate in HD mode...») appears on the TV screen

Trouble	Measures
The «TV System» option in the bootstrap loader settings contains one of HD modes, although the video output, which is currently used (SCART, composite CVBS or S-Video) does not support HD mode.	Use video output which supports HD-modes, i.e. component Y-Pr-Pb or HDMI, or set SD-mode in the bootstrap loader menu (for example, «576i PAL»)

Video is present on the screen, but sound is absent

Trouble	Measure
Audio channel from the device is incorrectly linked to the TV	Check the connection of audio channel (see «MAG-200 connection to TV set»)
The audio cable is defective or electric contact is faulty	Try to connect audio using another cable or another connecting scheme (see «MAG-200 connection to TV set»). Check the connection firmness.
Volume level on the TV and/or STB is set below the threshold of hearing	Check the volume level on your TV and/or MAG-200

Basic software cannot be loaded

Messages «No link detected», «DHCP Retry#» и «DHCP Error» appear on the screen

Trouble	Measures
The «Boot Mode» option in the bootstrap loader menu is set to «DHCP», but Ethernet cable («patch-cord») is not linked to the connector «LAN» of the device	If you intend your device to be loaded from the local network, check the connection of the Ethernet cable. The connector RJ-45 must be inserted firmly (up to specific click). If a patch-cord is not available set the option «Boot Mode» in the bootstrap loader menu to «NAND»
The Ethernet cable is not activated or faulty	If the LEDs (green and yellow) are not lit in the «LAN» connector, refer to the technical support service of your network operator
Other troubles	Refer to the technical support service of your network operator

Refer to the technical support service of your operator if one of the following messages appears on the TV screen:

– «Error loading image from nand»
– «Active partition not valid»
– «Wrong image»
– «Wrong digital signature»

Specification

Note

The device can be manufactured in different variants, which may differ by the type of connectors and capabilities of playing various formats of media data.

The device can operate in Standard Definition (SD) mode 576i and High Definition (HD) modes 576p, 720p, 1080i

Different video outputs support the following modes:

Video output	PAL (576i)	576p-50/60	720p-50/60	1080i-50/60
CVBS/SCART	+			
S-Video	+			
Component out/SCART – YPrPb	+	+	+	+
Component out/SCART – RGB	+			
HDMI	+	+	+	+

Ethernet port characteristics:

- Fully compatible with IEEE 802.3 standard
- Support of 10Base-T and 100 Base-TX interfaces
- Automatic polarity detection
- 10/100 Mbit/sec data rate, automatic adjustment
- Full duplex or half duplex, automatic detection
- Maximum level of breakdown voltage – no less than 1500V AC

USB 2.0 port supports full and low speed and takes devices with consumption of current up to 500 мА.

Dimensions of the device:

а) height – 66 mm;

б) frontal width – 300 mm;

в) length – 237 mm;

Mean-time-between-failures: at least 15 000 hours

Average resource: at least 10 years

Power supply of the TV device

AC supply mains, voltage 100-240V, frequency 50 or 60Hz. Power consumption in the active mode – 12W. Average power consumption – 7W. The absence of forced air-cooling system ensures noiseless operation of the device.

Appendices

Supported content formats

Supported audio/video codecs

IPTV MAG-200 device can play audio and video compressed by the following codecs:

Codec	Limitations
Video	
MPEG2	Main Profile@High Level
H264	Main and High Profile@level 4.1
MPEG4P2 (DivX4,5 и XviD)	Only SD (Standard Definition)
VC-1	Advanced Profile@Level 3
WMV9	Main Profile@High Level
Audio	
mpeg2-audio	MPEG1 and MPEG2 audio Layer I and II
mp3	
AC-3	

Supported content formats (containers)

IPTV MAG-200 service supports the following formats

Containers	Supported codecs
MPEG-TS (file, rtp, udp, rtsp)	MPEG2, MPEG4P2, h264,VC-1, mpeg2-audio, mp3*, AC-3
MPEG-PS (VOB)	MPEG2, mpeg2-audio, AC-3, mp3*
avi	MPEG2, MPEG4P2, h264,VC-1,WMV9, mpeg2-audio, mp3, AC-3
mkv	MPEG2, MPEG4P2, h264,VC-1,WMV9, mpeg2-audio, mp3, AC-3
mov	MPEG4P2, h264, mp3, AC-3
mp4	MPEG4P2, h264, mp3, AC-3
wmv	VC-1,WMV9, mp3, AC-3
ac3	AC-3
mp3	mp3

Media server settings (UPnP)

IPTV MAG-200 allows playing content from UPnP media server. The «Home media server (UPnP)» can be used as such server on the computer under MS Windows operating system.

Installation and setting “Home media server”

To install and setup the server perform the following steps:

1. Download the installation of the server from the home page http://www.homemediaserver.ru/page10.php
2. Install the server with the default settings.
3. After the installation add exclusion for this server in the firewall.
4. Restart the computer.
5. It is recommended to set the following options in the server settings:
    a. Set fixed port in the menu “Settings/server”.
    b. In the menu “Settings/Device” reset the option “Always perform transcoding if subtitles are detected”. Set the option “Russian names of main folders” to “Translit”.
    c. Add the extension «mkv» to the line “Films” in the menu “Settings/Device/Built-in support of files”.
    d. Set the following options in the bookmark “Scanning” in the menu “Settings/Media-resources”:
        - Always use file name as the name of the media resource
        - Delete information of the media resource if the file of the media resource is not found
        - Read characteristics of new files when scanning
6. Add directory with media content through the menu “Settings/Media-resources”, press the “Scan” button and restart the server.

After that all the media data, which are open at the server will appear in the folder «av» when viewing media content.

Format of the file with the list of TV channels

Default list of TV channels can be prepared in any text editor. It is a regular text file in the following format:

```
[channels]
ChannelName:Solution URL,
ChannelName:Solution URL,
 ....................
ChannelName:Solution URL
```

The section begins with the header *[channels].* Square brackets are obligatory.

The header is followed by the list of lines. Each line describes one channel. The line being not last must end with the character «**,**» (comma).

The last line in the list must not end with the comma.

Each line consists of three main parts (fields) — channel name (*ChannelName*), the channel launching parameter (Solution) and the server address (URL).

Channel name field can consist of any character excluding the colon ("**:**").

Solution is a special word (see "Channel launching parameter («Solution»)") separated from the channel name with the character «**:**» (colon).

URL is separated from the solution with a space and has a standard format:

```
<network_protocol>://<IP_address>:<port>
```

Example of the file:

```
[channels]
Watches:rtp udp://224.10.0.125:1234,
Winn Dixie:rtp udp://224.10.0.126:1234,
mPhase_ac3.mpg:rtp udp://224.10.0.127:1234
```

Comments:

```
[channels]              – section header
Watches                 – channel name
:                       – delimiter
rtp                     – solution
<space>                 – delimiter
udp://224.10.0.125:1234 – server URL
,                       – sign of the not last line
```