testing procedure

IPTV-high-definition set-top boxes

MAG-200

Content

The list of equipment required for testing set-top boxes

For inspection MAG-200 set-top box you need the following equipment:

- PAL TV system and support for HDTV modes:
  - 576i;
  - 576p-50;
  - 720p-50;
  - 1080i-50.
- Cable «S-Video». Standard cable, ending a 4-pin connector Mini-DIN.
- "3hRCA" cable. Standard 3x-wired cable, terminated RCA connectors yellow (video), red (right stereo channel, «R») and white (the left stereo channel, «L») color.
- "2hRCA" cable. Standard 2x-wire cable terminating connectors RCA red (right stereo channel, «R») and white (the left stereo channel, «L») color.
- Cable «HDMI - HDMI».
- «SCART» cable.
- Music center to decode the AC3 (Dolby Digital) on the S-PDIF cable.
- «S-PDIF» cable. Standard coaxial cable for transmitting a digital audio signal, terminating connector RCA.
- Standard computer keyboard (USB).
- A standard computer mouse (USB).
- Access to the Internet via a network cable, terminated RJ-45 connector.

The terminology used herein

Image Format - the ratio between the width and height of the image on the TV screen. For example, the format "4: 3".

CVBS - composite video output on the console. Appropriate video input on the TV is an RCA connector yellow.

Check the physical interfaces consoles

General remarks

- In auditing it is assumed that in the initial state, the power cable set-top box connected to the mains and switch on its rear panel is turned off.

- It is not recommended to use multiple video outputs on the set-top box. When you change the video output disable unused video output cable from the console.

- Some cables are required for the inspection, are not included in the package prefix «MAG-200" and must be purchased separately.

- there is a need to enter the menu set-top box loader to carry out some checks. To access the boot menu should immediately after power press and hold "  "On the front panel to set-top boxes menu appears on the TV screen. It is important to note that the TV in this case must be activated by the appropriate video input. To save changes, exit the menu, by selecting the item «Exit & Save».

- When testing a particular video output prefixes, the TV should be set active (current) corresponding to the video input. To do this, use the appropriate Service Tools (menu) of the available television.

- When checking the video output consoles successful check result can be regarded as monitoring the TV screen stable color image, for example an initial screen with «TeleTec» company logo.

- The results of all checks written in the protocol, a sample form which is annexed to this document.

LAN validation

Check «LAN» connector indirectly exercised at all stages related to downloading audio and video content over the Internet. In case of failure content connector will not boot.

Checking USB

Check the keyboard connection

testing procedure

one) Connect the keyboard via the connector «USB» consoles.

2) Connect the set top box according to one of the video output.

3) Turn on the console and wait until it is loaded.

four) Go to the service menu, set-top boxes of «Services» button on the remote remote control.

five) Pressing the "up" cursor keys and the "down" on the keyboard make sure that the active line of service menu accordingly moves up and down.

6) Enter the test results in the protocol.

Check the mouse connection

testing procedure

one) Connect a mouse to the «USB» connector console.

2) Connect the set top box according to one of the video output.

3) Turn on the console and wait until it is loaded.

four) Go to the service menu, set-top boxes of «Services» button on the remote remote control.

five) By moving the mouse, make sure it appears on the screen as a mouse black arrow. Additionally, you can be sure that when you move the mouse cursor on the service menu, the active menu bar to adequately respond.

6) Enter the test results in the protocol.

Check the video output «S-Video»

testing procedure

one) Connect the console to the TV through a cable «S-Video».

2) Set the TV to the appropriate video input is active.

3) In the menu, set-top boxes loader set the «TV System» is set to «PAL (576i) ». Exit the menu with saving changes.

four) Watch TV image obtained on the screen for loading consoles.

five) Enter the test results in the protocol.

Checking the composite output («CVBS»)

testing procedure

one) Connect the console to the TV via cable 3xRCA, using
Only one of the wires terminating RCA type yellow.

2) Set the TV to the composite video input active.

3) In the menu, set-top boxes loader set the «TV System» is set to «PAL (576i) ». Exit the menu with saving changes.

four) Watch TV image obtained on the screen for loading consoles.

five) Enter the test results in the protocol.

Check the component video output («YPrPb»)

To perform this test requires that the current component video consoles was «YPrPb». To do this, prefix the bootloader menu, set the «Component Out» to a value «Y-Pr-Pb». Connect the component video output cable 3xRCA «YPrPb» consoles

c

the corresponding video input of the TV.

Set the TV to the current component video «YPrPb».

Checking mode 576i (PAL)

testing procedure

one) The consoles boot menu set the «TV System» in value «PAL (576i)». Exit the menu with saving changes.

2) Watch TV image obtained on the screen for loading consoles.

3) Enter the test results in the protocol.

Checking mode 576p-50

testing procedure

one) The consoles boot menu set the «TV System» is set to «576p-50". Exit the menu with saving changes.

2) Watch TV image obtained on the screen for loading consoles.

3) Enter the test results in the protocol.

Checking mode 720p-50

testing procedure

one) The consoles boot menu set the «TV System» is set to «720p-50". Exit the menu with saving changes.

2) Watch TV image obtained on the screen for loading consoles.

3) Enter the test results in the protocol.

Checking mode 1080i-50

testing procedure

one) The consoles boot menu set the «TV System» in value «1080i-50." Exit the menu with saving changes.

2) Watch TV image obtained on the screen for loading consoles.

3) Enter the test results in the protocol.

Checking the component video output («RGB»)

To perform this test requires that the parameter «TV System» menu consoles loader was set to «PAL (576i)». Parameter «Component Out» must be set to «RGB» value.

testing procedure

one) Connect the console to the TV via a SCART cable.

2) Set the TV to the appropriate video input is active.

3) Turn on the console.

four) The service menu consoles go in the form of "Demo API».

five) Start video content with sound, using
This list of server addresses and click «Play».

6) Ensure you have an image of sustainable and high-quality stereo sound.

7) SCART cable disconnect.

eight) Enter the test results in the protocol.

Check HDMI video output

To carry out the following checks need to connect the video «HDMI» consoles c corresponding video input of the TV with an HDMI cable.

Checking mode 576i (PAL)

testing procedure

one) The consoles boot menu set the «TV System» in value «PAL (576i)». Exit the menu with saving changes.

2) Wait loading boxes, run the service menu and go to form «API Demo".

3) Start video content with sound, using This list of server addresses and click «Play».

four) Ensure you have an image of sustainable and high-quality digital stereo sound.

five) Enter the test results in the protocol.

Checking mode 576p-50

testing procedure

one) The consoles boot menu set the «TV System» is set to «576p-50". Exit the menu with saving changes.

2) Wait loading boxes, run the service menu and go to form «API Demo".

3) Start video content with sound, using This list of server addresses and click «Play».

four) Ensure you have an image of sustainable and high-quality digital stereo sound.

five) Enter the test results in the protocol.

Checking mode 720p-50

testing procedure

one) The consoles boot menu set the «TV System» is set to «720p-50". Exit the menu with saving changes.

2) Wait loading boxes, run the service menu and go to form «API Demo".

3) Start video content with sound, using
This list of server addresses and click «Play».

four) Ensure you have an image of sustainable and high-quality digital stereo
sound.

five) Enter the test results in the protocol.

Checking mode 1080i-50

testing procedure

one) The consoles boot menu set the «TV System» in value
«1080i-50." Exit the menu with saving changes.

2) Wait loading boxes, run the service menu and go to form
«API Demo".

3) Start video content with sound, using
This list of server addresses and click «Play».

four) Ensure you have an image of sustainable and high-quality digital stereo
sound.

five) Enter the test results in the protocol.

Check the analog stereo audio output

testing procedure

one) 2hRCA RCA cable connectors connect the accessory «R» (right channel output
Stereo sound), and «L» (left channel stereo sound output) to the corresponding inputs on the television.

2) Start a video or audio content. You can use the form
"Demonstration API» service menu.

3) Make sure that the sound is no distortion on both channels.

four) Enter the test results in the protocol.

Checking the digital stereo output «S-PDIF»

testing procedure

one) Connect the component video output cable 3xRCA «YPrPb» consoles c
the corresponding video input of the TV.

2) In the TV to the appropriate video input active.

3) 2hRCA connect cable connectors on the console «R» (right channel output
Stereo sound), and «L» (left channel stereo sound output) to corresponding analog audio inputs on the television.

four) Through the S-PDIF cable is connected to «S-PDIF» consoles musical
center with the opportunity to decode AC3 (Dolby Digital).

five) Turn on the console. In the boot loader menu to set the parameter «Component Out» in
value «Y-Pr-Pb»

6) View form «API Demo".

7) Set «SetupSPdif» function parameter is set to "0". press
«SetupSPdif».

eight) Start content. It should be observed as follows:

- The TV receives an analog stereo sound;
- The sound is not supplied stereo.

9) Stop content playback button «Stop».

ten) Set «SetupSPdif» function parameter is set to "1". press
«SetupSPdif».

eleven) Start content. It should be observed as follows:

- The TV receives an analog stereo sound;
- The music center receives a digital 2-channel sound. At the appropriate indication, such as «PCM» should appear in the display the music center.

12) Stop content playback button «Stop».

13) Set «SetupSPdif» function parameter is set to "2". press
«SetupSPdif».

14) Start content. It should be observed as follows:

- The TV receives an analog stereo sound;
- The music center receives the compressed digital audio in AC3 format. The display music system having AC3 decoder corresponding indication, e.g. «Dolby Digital» should appear.

15) Enter the test results in the protocol.

Checking JavaScript API programming interface

one. To carry out the following checks must download the service menu
top box and select "Demo API» («API Demo»).

2. Shape "Demonstration API» is intended to demonstrate that it functions
software interface with the prefix. Names of functions corresponds to the inscription on the buttons. Function parameters are entered into the input field located immediately before the corresponding button. To start you need to press the button with the appropriate name.

Note.

Switching function of the selected window on top of other «SetTopWin» for convenience displayed on the blue button on the remote prefix remote control. This parameter determines the function of the window, which should be brought to the front. The initial value is "0", that is when you first press the button on top of the graphics window is displayed with a form of "Demonstration of the API". Each press of the blue button increases the value by 1. That is, each time you press the button the following window will be displayed on top of the other.

3. For ease of use of the "Demo API» can be connected
USB-keyboard.

four. A detailed description of the programming interface functions can be found in document
«JavaScript API Specification for IPTV-management consoles MAG-100 and MAG-200."

Setting Alpha

function " **SetAlphaLevel »** It allows you to set the transparency of the video window. function " **SetWinAlphaLevel »** It allows you to specify the degree of transparency of the graphic window.

testing procedure

one) View form «API Demo".

2) Start video content, using a list of addresses of servers and key «Play». You should see the video window to play video content.

3) Press on the remote control blue button. At the same time on the screen a graphical window with a form of "Demo API» should appear.

four) Set the «SetAlphaLevel» function is set to 0h70 and click «SetAlphaLevel».

five) Switch back to the video window again by clicking on the blue button remote. at This appears on the screen the video window should have a semi-transparent image, which should be viewed through the form «API Demo".

6) Set the «SetAlphaLevel» function is set to 0xFF, and then click SetAlphaLevel (turn off transparency).

7) Make sure that the video window was completely opaque.

eight) Switch to a graphical window on the blue button.

9) Set the «SetWinAlphaLevel» function is set to 0h70 and press button «SetWinAlphaLevel».

ten) Make sure that the graphics window was translucent, and through it you can watch playable content in the video window.

eleven) Set the «SetWinAlphaLevel» function is set to 0xFF and press SetWinAlphaLevel button (to turn off transparency).

12) Make sure that the graphics window again become completely opaque.

13) Enter the test results in the protocol.

Mode Control ChromaKey

Method (button) " **SetChromaKey »** It allows you to set the color and the mask to set the transparency of the colors in the current window. method " **SetMode** "Turns on and off the preset mode.

testing procedure

one) Make sure that the circle to the left of «StandBy» in the current window has Red color.

2) In the first input field before pressing «SetChromaKey "(option key) to enter the number 0xFF0000. This sets the transparency for the red color.

3) In the second input field before pressing «SetChromaKey "(parameter mask) enter number 0xFFFFFF.

four) Press «SetChromaKey ".

five) Enter in the field in front of «SetMode» button is 1.

6) Press «SetMode».

7) Make sure that the red circle to the left of «StandBy» in this window He became transparent.

eight) Enter in the field in front of «SetMode» button to 0.

9) Press «SetMode».

ten) Make sure that the transparent circle to the left of «StandBy» again became red.

eleven) Enter the test results in the protocol.

Positioning and scaling of the video window

functions " **setViewPort »** and " **SetPIG »** allow you to specify the size of the video window, smaller than a full TV screen (for a given resolution), and specify the position of the video window on the screen relative to the upper-left corner of the screen.

Check «SetViewPort» function

one) View form «API Demo".

2) Start video content, using a list of addresses of servers and key «Play». You should see the video window to play video content.

3) Go to the graphics window with the form of "Demonstration API», clicking on the remote remote control blue button.

four) Set the following parameters «SetViewPort» function:

- Parameter 1 - The window width in pixels (default 320).
- Parameter 2 - The height of the window in pixels (default 240).
- Parameter 3 - displacement of windows horizontally from the left edge of the screen (default is 72).
- Parameter 4 - offset window vertically from the top of the screen (default is 57).

five) Press «SetViewPort»

6) Switch back to the video window, by clicking on the blue button remote. Wherein on top form "Demo API» should appear smaller video window than the full-sized screen. If you use the default values of the video window takes up about a quarter of the screen and arranged with small indents from the top left corner of the screen.

7) Enter the test results in the protocol.

Check «SetPIG» function

one) View form «API Demo".

2) Start video content, using a list of addresses of servers and key «Play». You should see the video window to play video content.

3) Go to the graphics window with the form of "Demonstration API», clicking on the remote remote control blue button.

four) Set the following parameters «SetPIG» function:

- Parameter 1 to 0 (the output of the scaled video window).
- Parameter 2 - The scale of the video window (default 128).

- Parameter 3 - displacement of windows horizontally from the left edge of the screen (default is 23).

- Parameter 4 - offset window vertically from the top of the screen (default is 32.

five) Press «SetPIG»

6) Switch back to the video window, by clicking on the blue button remote. Wherein
on top form "Demo API» should appear smaller video window than the full-sized screen. If you use the default values of the video window takes up about a quarter of the screen and arranged with small indents from the top left corner of the screen.

7) Enter the test results in the protocol.

Convert image formats (SetAspect)

function " **SetAspect »** It allows you to convert the format of the video stream in the format of the TV screen, depending on the mode selected video output consoles. The function has four conversion modes:

- "As it is"
- «Letter Box»
- «Pan & Scan»
- "Combined"

In Table 1, "Description image format conversion mode" (see. Below) schematically illustrate various embodiments of the image on the TV screen, obtained by applying different conversion modes, depending on the video stream format ("flow") and the mode of video output («TV ").

testing procedure

Notes.

- The verification is used below Table 2, "Check format conversion mode".
- Inspection is carried out on a TV that supports the picture format of 16: 9.

one) The consoles boot menu set the «TV System» in value
the corresponding column "Mode" in Table 2. Exit menu with saving changes.

2) Wait loading boxes and enter the form of a "Demonstration API» service
menu.

3) Set «SetAspect» function parameter to 0 and click «SetAspect».

four) Start the video content corresponding to the format (4: 3 or 16: 9) using
This list of server addresses and click «Play». Make sure that the image appears on the screen corresponds to the form given in Table 2 "Picture" column.

five) Jump out the window with a form of "Demo API», clicking on the remote
Control the blue button.

6) To check the relevant conversion mode set the parameter
function «SetAspect» in value from the corresponding column of Table 2. Press the «SetAspect».

7) Switch back to the video window, by clicking on the blue button remote.

eight) Make sure that the picture format has changed in accordance with the description,
in Table 2 in the "Image" column and "Comments."

9) Enter the test results in the protocol.

Table 1. Description of image formats conversion modes № Feed

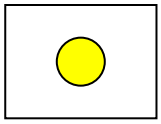
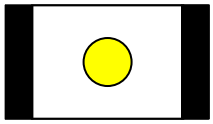
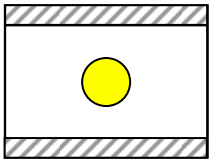
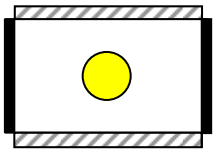
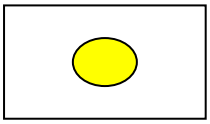
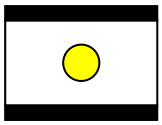
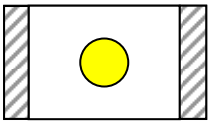
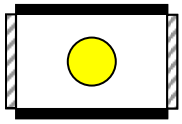
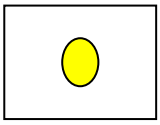
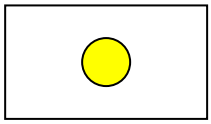
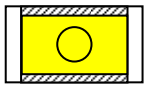
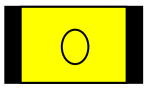
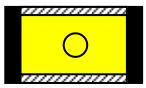
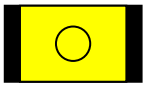
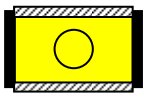
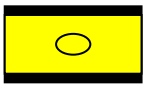
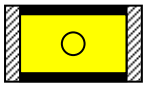
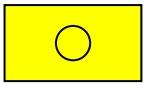
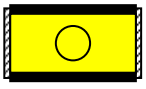
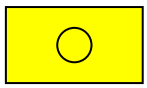
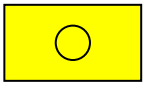
		TV	conversion mode	Picture
one	4: 3	4: 3 (576i)	In any mode	
2		16: 9 (720i, 1080i)	**«Letter Box» mode.** The screen remains unused (black area). Geometric distortion is no picture.	
3			**«Pan & Scan» mode.** Part of the flow of information is outside the screen (hatched area). Geometric distortion is no picture.	
four			**The "combined" mode.** At the same time, and part of the flow is outside the screen, and the screen remains unused. Geometric distortion is no picture.	
five			**"As there are" mode.** Image is stretched horizontally.	
6	16: 9	4: 3 (576i)	**«Letter Box» mode.** The screen remains unused (black area). Geometric distortion is no picture.	
7			**«Pan & Scan» mode.** Part of the flow of information is outside the screen (hatched area). Geometric distortion is no picture.	
eight			**The "combined" mode.** At the same time, and part of the flow is outside the screen, and the screen remains unused. Geometric distortion is no picture.	
9			**"As there are" mode.** The image is stretched vertically.	
ten		16: 9 (720i, 1080i)	In any mode	

Table 2. Testing modes reformatting № flow mode image SetAspect

					Comments
1 2 3 4	576i	4: 3	0x00 0x10 0x20 0x30		No changes
five		16: 9	0x00		**"As it is".** Image horizontally compressed
6			0x10		**«LetterBox».** The image is compressed vertically. Top and bottom lurks graphics window. No distortion.
7			0x20		**«Pan & Scan».** Image is stretched horizontally. No distortion.
eight			0x30		**"Combined".** The image is compressed vertically and expands horizontally. No distortion.
9	576p: 50	4: 3	0x00	Sm.p.1	Sm.p.1
ten			0x10	Sm.p.2	Sm.p.2
eleven			0x20	Sm.p.3	Sm.p.3
12			0x30	see section 4	see section 4
13		16: 9	0x00	see section 5	see section 5
14			0x10	see section 6	see section 6
15			0x20	see section 7	see section 7
sixteen			0x30	see section 8	see section 8
17	720p: 50	4: 3	0x00		**"As it is".** The image compressed vertically
18			0x10		**«LetterBox».** The image is compressed horizontally. Left and right lurks graphics window. No distortion.
nineteen			0x20		**«Pan & Scan».** The image is stretched vertically. No distortion.
20			0x30		**"Combined".** The image is compressed both horizontally and vertically stretched. No distortion.
21 22 23 24		16: 9	0x00 0x10 0x20 0x30		No changes
25	1080p: 50	4: 3	0x00	Sm.p.17	Sm.p.17
26			0x10	Sm.p.18	Sm.p.18
27			0x20	Sm.p.19	Sm.p.19
28			0x30	Sm.p.20	Sm.p.20

29 30 31 32		16: 9	0x00 0x10 0x20 0x30		No changes

Note.

Graphical window (form "Demo API») Video window (video

image) Area without an image of the screen

Check codecs

Top box MAG-200 supports mpeg2-video codecs, mpeg2-audio, h264 and AC3. Checking is made codec performance in the presence of the corresponding transport stream. For example, to check the codec mpeg2-video and mpeg2-audio you need to run a transport stream containing mpeg2-video and mpeg2-audio content. You can use a form of "Demonstration API» to launch content for playback.

In normal operation, the codec should be observed:

- stable color image on the TV screen;
- quality sound without any distortion in the TV speaker system. test results are recorded

in the minutes.

Checking server support video

It serves the function «SetupRTSP» To view video content from RTSP-server. For more information about the parameters of this function and their use, see. Document «JavaScript API Specification for IPTV-management consoles 100 and MAG-MAG-200".

Methods of test work with consoles «BitBand» server

one) View form «API Demo".

2) Start function «SetupRTSP» with the following parameters:

- Parameter 1 («type»): for "BitBand" server set to "1".
- Parameter 2 («flags»): set the value of "0h29"[*] i.e:
  - included maintaining connection mode («keep-alive»);
  - inclusive definition flux closure;
  - for video transmission using UDP transport.

3) Enter the string to start the video content RTSP-server.

Example. Suppose RTSP-server has the following data:

IP-address:	10.20.30.40
Port:	554
File name:	1.mpg

In this case the line to start the video content will be as follows:

rtsp rtsp: // 10.20.30.40:554/1.mpg

four) Press the button «Play». In the video window should appear on the screen to be played video content with audio (depending on the received content).

five) Enter the test results in the protocol.

Methods of test work with consoles «Kasenna» server

6) View form «API Demo".

7) Start function «SetupRTSP» with the following parameters:

- Parameter 1 («type»): for "Kasenna" server set to "2".
- Parameter 2 («flags»): set the value of "0h29"[*] i.e:
  - included maintaining connection mode («keep-alive»);
  - inclusive definition flux closure;
  - for video transmission using UDP transport.

eight) Enter the string to start the video content RTSP-server.

[*] This value corresponds to a typical video server settings. In each case, when setting this value should proceed from the specific video server settings.

Example. Suppose RTSP-server has the following data:

IP-address: 10.20.30.40

Port: 554

File name: 1.mpg

In this case the line to start the video content will be as follows:

rtsp rtsp: // 10.20.30.40:554/1.mpg

9) Press the button «Play». In the video window should appear on the screen to be played video content with audio (depending on the received content).

ten) Enter the test results in the protocol.

application

EXAMPLE verification protocol prefix «MAG-200"

Date:
reviewer:

number	What is checked	Result	Comments
	Check the physical interfaces		
	one USB Keyboard 2 USB mouse 3 video		
	«S-Video» 4 video «CVBS» 5 video «YPrPb» /		
	576i 6 video «YPrPb» / 576p-50 7 video «YPrPb» /		
	720p-50 8 video «YPrPb» / 1080i-50 9 video		
	«RGB» (SCART) 10 analog stereo (SCART) 11 video		
	«HDMI» / 576i 12 video «HDMI» / 576p-50 13 video		
	«HDMI» / 720p-50 14 video «HDMI» / 1080i-50 15 analog		
	stereo audio L / R 16 Digital stereo sound		
	«S-PDIF»		
	Checking software interface functions		
	17 «Alpha» 18 «ChromaKey» 19 «SetViewPort» 20 «SetPIG»		
	21 «SetAspect» / 576i / 4: March 22 «SetAspect» /		
	576i / 16: September 23 «SetAspect» / 720i-50/4:		
	March 24 «SetAspect» / 720i-50/16: September		
	25 «SetAspect» / 1080i-50/4: March 26 «SetAspect»		
	/ 1080i-50/16: 9		
	Check codecs		
	27 mpeg2 codec 28 mpeg2-audio		
	codec 29 h264 codec 30 AC3		
	codec		
	Check support RTSP-server		
	31 «Kasenna» server 32 «BitBand»		
	server		
	33		