



Technical manual
(preliminary)

3G HD/SD SDI Master Control Switcher RING-22



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Introduction

RING - 22 is a professional multi - format digital video switcher with a wide range of applications. The design of the RING-22 switcher allows installation of the additional modules expanding its functionality. The RING 22 main unit is mountable on the 19 inch rack and the control keyboard panel can be placed on a flat surface.

The RING 22 has easy-to-use effects, such as Chroma / Luma Key, DSK, PIP, logo insertion, still picture stores and 2 on board video players (SD Card). Different transitions effects, including “Stinger”. Quick start - about 4 sec.

1. Features

Video inputs:		
RING22 Mini: 10 inputs - basic set:		
8 3G HD/SD SDI*	8 BNC connectors	Main board
2 HDMI *	2 DVI-D connectors	
1 HDMI	1 DVI-D connector, titles from PC	see below “ External titles”
1 CVBS	1 BNC connector - external synchronization input	CVBS Black Burst PAL or 3 Level Sync
RING22 Midi: 16 inputs - one input board is installed (+6 inputs)		
8 3G HD/SD SDI*	8 BNC connectors	Main board
6 HD/SD SDI* (or up to 6 CVBS)	6 BNC connectors	6 adjustable SDI or CVBS inputs
2 HDMI *	2 DVI-D connectors	
1 HDMI	1 DVI-D connector for titles from PC	see below “ External titles”
1 CVBS	1 BNC connector - external synchronization input	CVBS Black Burst PAL or 3 Level Sync
RING22 MAXI: 22 inputs - two input boards are installed (+ 12 inputs)		
8 3G HD/SD SDI*	8 BNC connectors	Main board
12 HD/SD SDI* (or up to 12 CVBS)	12 BNC connectors	12 adjustable SDI or CVBS inputs
2 HDMI *	2 DVI-D connectors	
1 HDMI	1 DVI-D connector, titles from PC	see below “ External titles”
1 CVBS	1 BNC connector - external synchronization input	CVBS Black Burst PAL or 3 Level Sync
Video outputs **		
5 HD/SD SDI*	5 BNC connectors *;	
1 HDMI *	1 DVI-D connector*	Multiviewer output. 1080 HD or 4K

* with embedded audio.

** Each of the Switcher outputs can be set to: Program, Preview, Multiview, or any of the inputs. The Program output can be assigned as "Logo Free" or "Logo + Titles Free".

Analog Audio Inputs:		
2 stereo.	2 XLR connectors (5 pins)	
Analog Audio Outputs:		
1 stereo	1 XLR connector (5 pins)	
Supported formats and standards		
Inputs:	HD SDI - 1080p 50;	
	HD SDI - 1080p 25;	
	HD SDI - 1080i 50;	
	HD SDI - 720p 50;	
	SD SDI- 576i 50 (format 4/3 or 16/9)	
	CVBS- 576i 50 (format 4/3 or 16/9)	
Outputs:	HD SDI- 1080p 50	
	HD SDI- 1080i 50	
	SD SDI- 576i 50 (format 4/3 or 16/9)	
Video Processing:	10-bits, Color representation 4:2:2	
Audio Processing:	20 or 24 bits. 48 kHz	

Each input has its own frame synchronizer	Not only video signals, but also the embedded audio is synchronized. Besides, the Switcher has an input of external synchronization. In signal of external synchronization of our HD Switcher it can be used not only special 3 - level signal (3 Level Sync), but also CVBS Black burst PAL
Video players on SD-card	Two built-in video players with a high quality of VC-3 (DNxHD) from SD cards. The players work as independent sources and have separate buttons on the Control Panel . The quantity and the size of video files is limited by the card's capacity - about 60 minutes of video on the 64 Gb SD card.
External titles.	There is two options: 1) "Fill and Key" two component tiles (any two inputs); 2) Hardware-software program "TitleMaster" - titles from HDMI output of the PC video card
GPI	Mini Jack Connector
TALLY	Wired - via the connector D-Sub15F.
Built-in Multiviewer	The DVI-D output. Two mode - 4K or 1080i 50 resolution

	<p>The Multiviewer provides visual control of all video inputs sources and Program and Preview. Levels of audio sources (analog and digital video embedded). On screen menu for the quick settings of the most important parameters..</p> <p>Multiview contains the current time clock, current transition effect and other service information.</p> <p>It is possible to use not only professional monitors, but also inexpensive TV Sets and monitors which support video resolution 4K or 1080i 50.</p>
Still pictures (Slides, background)	24 still pictures for basic configuration and 24 still pictures on each extra input board. Still pictures can be used instead of any input. There is a possibility of the preliminary choice from the library which is stored in non-volatile memory.
Logos	Two logos independently overlaid to the Program output, with possibility of quick choice from 8, one of which is animated.
The Clock	Digital HH : MM : SS on Multiviewer.
	Digital HH : MM overlaid on Program output
Quick Start	<p>Quick start — about 4 seconds.</p> <p>In the event of a short-term power loss, the Switcher not only returns quickly to the operating mode, but also returns to the state at the moment of shutdown.</p>
Power	The switcher requires the stabilized 12 V power supply 7 A. PSU is included in the package. There are two power connectors (XLR 4pin) on the back of the Switcher. Both connectors are equal and intended to provide hot swappable supply in case of failure of the one of power supply unit. The Extra power supply unit can be purchased by separate order.
Addition options:	<p>«Encoder H264» -.</p> <p>“Reserved Power supply unit” - connecting in parallel to main Power unit.</p> <p>«Single Cable Cameras System» transmitting up to 4 video+ control + Intercom+ Power supply via Local Ethernet network.</p> <p>“Replay System” -</p>
The Ring-22 Control + Setting from PC	The “RING-22 Switcher Control Panel” program
	There is possibility of simultaneous management of the Switcher from the hardware Control Panel and from the PC – from the program simulator, “Switcher Control Panel Ring 22”.
Key mapping	
The built-in temperature sensor with indication of overheating of the Switcher on the Multiviewer.	
The built-in BLACK and Color BARS generators with an audio source signal (1KHz, 0dB) which can be switched on from the video Switcher Control Panel.	

Remote updating hardware and program providing on Ethernet.	
The case of the main unit is manufactured of metal and equipped with almost silent fans.	
The Control Panel is manufactured in the metal case, equipped with professional buttons with illumination (4 levels), the digital T-Bar. It is connected to a Switcher via RS232 or Ethernet interface	
Sizes and weight	Main Unit- 440x 220x 88mm (2U), ~5 kg. Control Panel -440x 220x44 mm, ~2.4 kg.
Free of charge from DV-Lab:	<ul style="list-style-type: none"> - Fast switching (~4 sec.); - SD Card on 16GB - with a starting set of effects and slides; - Software : <ul style="list-style-type: none"> “RING 22 Switcher Control Panel”; “DVLab Switcher Utilities ”; ”Title Master”; ”SD Card Manager HD”; “Playout HMDI”. ”Control Panel Config”

2. Video Switcher design

Structurally the video Switcher is executed for professional application — separately the block of the Main unit and the Control Panel unit which connect among themselves with one cable. It allows to rack-mount a video Switcher that, in turn, provides the stable thermal mode and simplifies technical maintenance.

In the main unit the hardware of processing of video and audio signals is placed, and the Control Panel forming commands for remote control of the Switcher is connected to the Main unit by a cable.

The main unit size — RACK 2U, with a possibility of installation in a standard rack 19". To this Main unit are connected all signal, managing and feeding cables.



On the front panel there is a switch of power with indication and the slot for a SD card

On the back panel (at the picture is Midi option). — all connectors of inputs, outputs, control and a power supply.

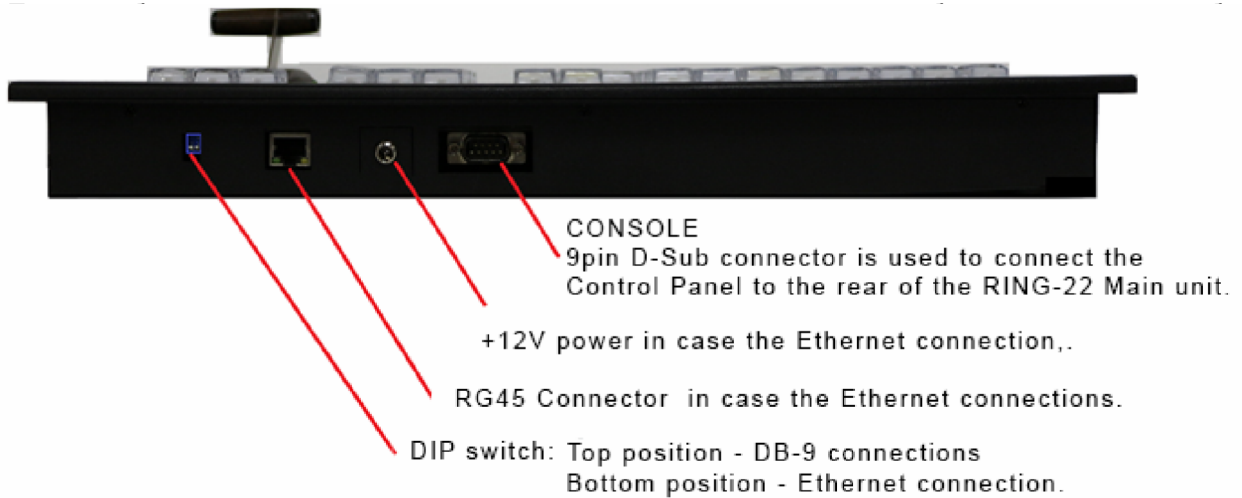


The remote Control Panel is connected to the main unit by one cable with DB9F connectors up to 20 meters long. A power supply to the Control Panel and signals of indication and control arrives on the same cable

The Control Panel can be connected to the main unit via Ethernet. In this case it is necessary to give in additions power supply (+12 V).

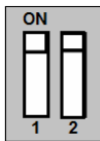
It is possible the common control of the switcher via PC and Control panel simultaneously. Video or audio signals to the Control Panel are not connected.

3. Connection of the remote Control Panel



3.1 Connection of the Control Panel to the Main unit

For work in this mode it is necessary to set DIP switch on the back panel of the Control Panel in the top position.

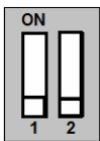


The control panel is connected directly to the main unit by a cable from the set of delivery (DB9F connectors). Cable length can be up to 20 m.

3.2 Connection of the Control Panel by local network

If it is necessary to increase distance between the Control Panel and the main unit, the panel can be connected by local area network. For this purpose it is necessary:

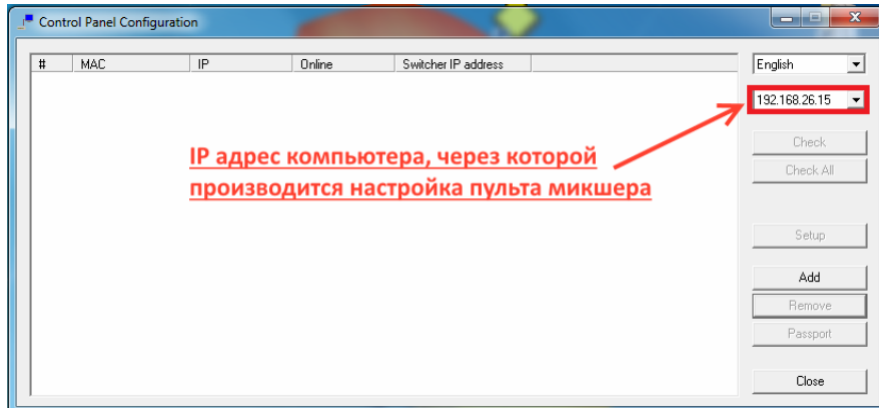
- 1) Set DIP switches on the back panel of the Control Panel to the bottom position:



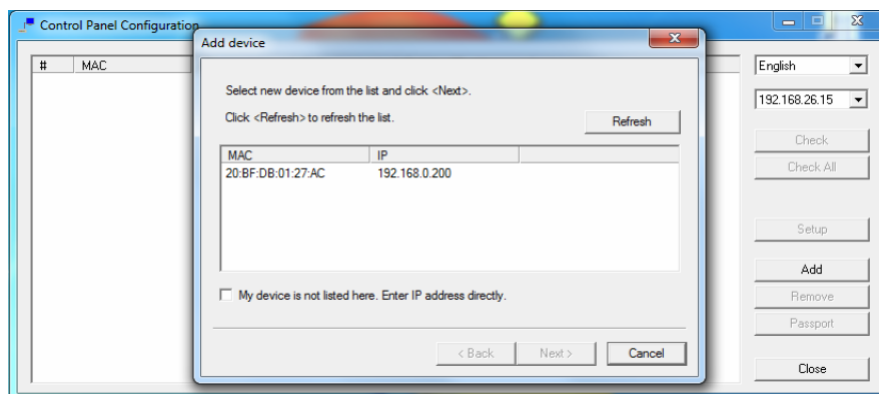
- 2) Using the RJ 45 connector to connect the Control Panel by standard Ethernet cable to a local area network or directly to the computer.
- 3) To connect Power unit (+12V) to the corresponding connector on the back panel of the Control Panel.
- 4) For connecting Control Panel with the Switcher it's needed to install and start the "Control Panel Config" program on the PC, the free utility which can be downloaded at the link:

<http://dv-lab.com/files/files3/ControlPanelConfig.zip>

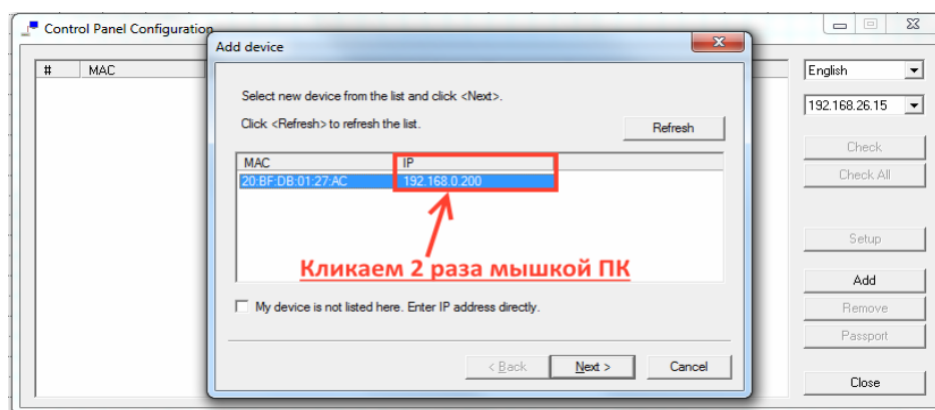
5) In the opened window of the program to be convinced that the specified IP address corresponds to the IP address of the PC through which setup of the Control Panel of a Switcher is made, in our example it is 192.168.26.15.



6. In the window of the program we click the "Add" button, then in the opened new window of the program the MAC address and the IP address (by default) of the Control Panel will appear.

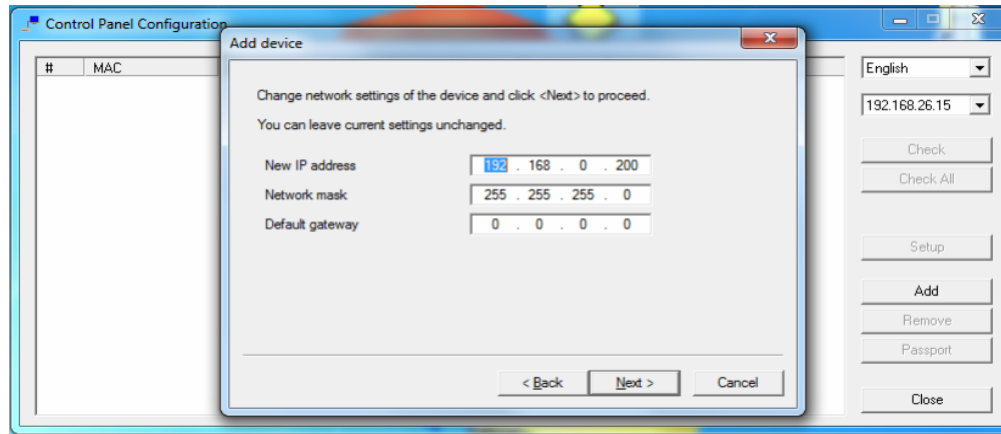


7. We double-click in the field "IP" of the Switcher.

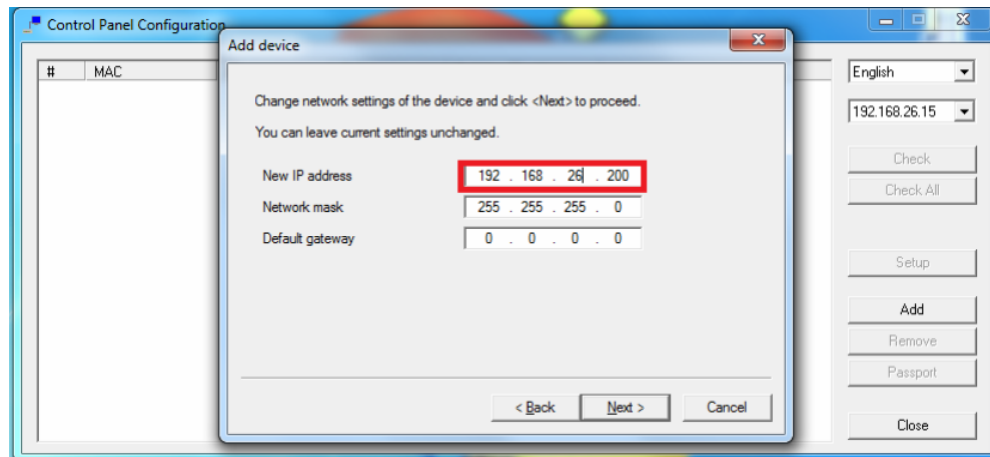


The window of setup parameters of network of the Control Panel will open. Parameters of network, if necessary, can be changed in accordance with parameters of a local area network to which the Control Panel is connected.

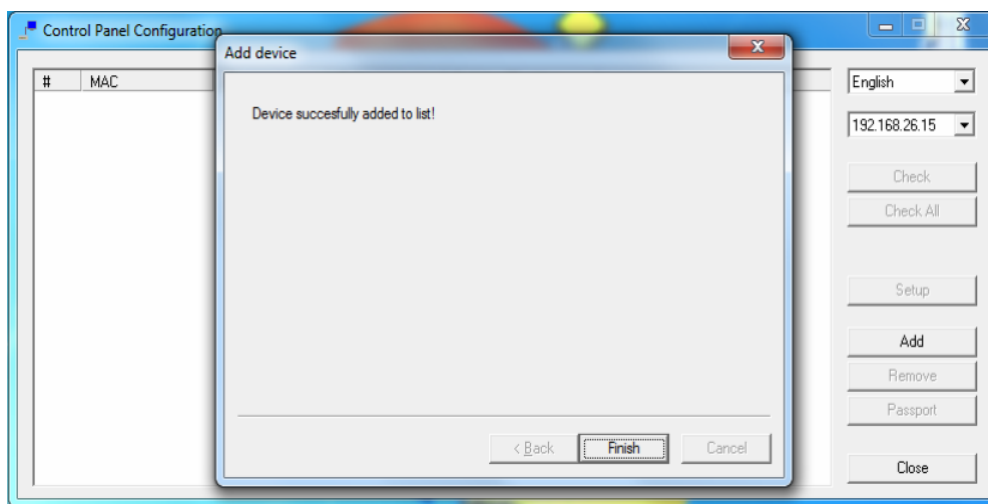
Important The Control Panel, Switcher and the PC from which control is carried out have to be in one subnet.



In our example, the IP address of Control Panel is 192.168.0.200, and the PC IP address from which is carried out setup of the panel, – 192.168.26.15, therefore it is necessary to change the Control Panel IP address to 192.168.26.200.



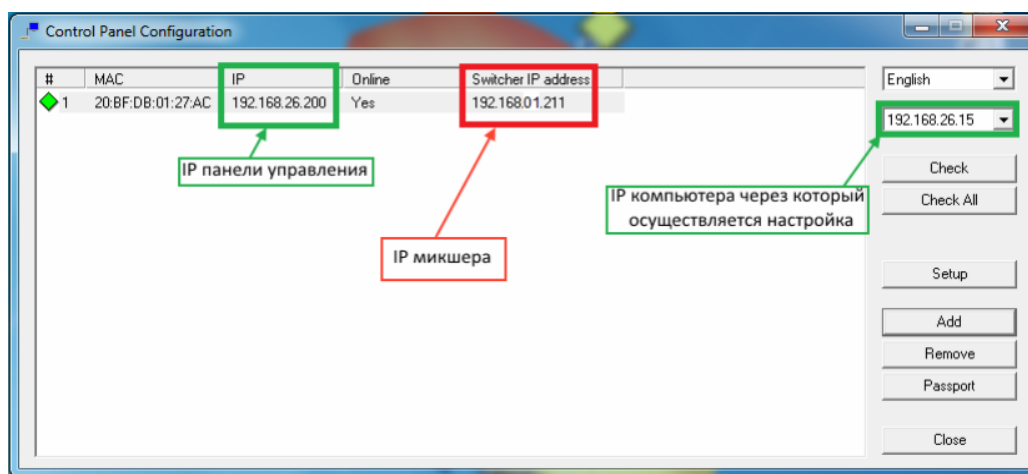
8. We click the Next button. The “Add device” window with the inscription "Device successfully added to list" will open.



Click "Finish" – window "Add device" will close.

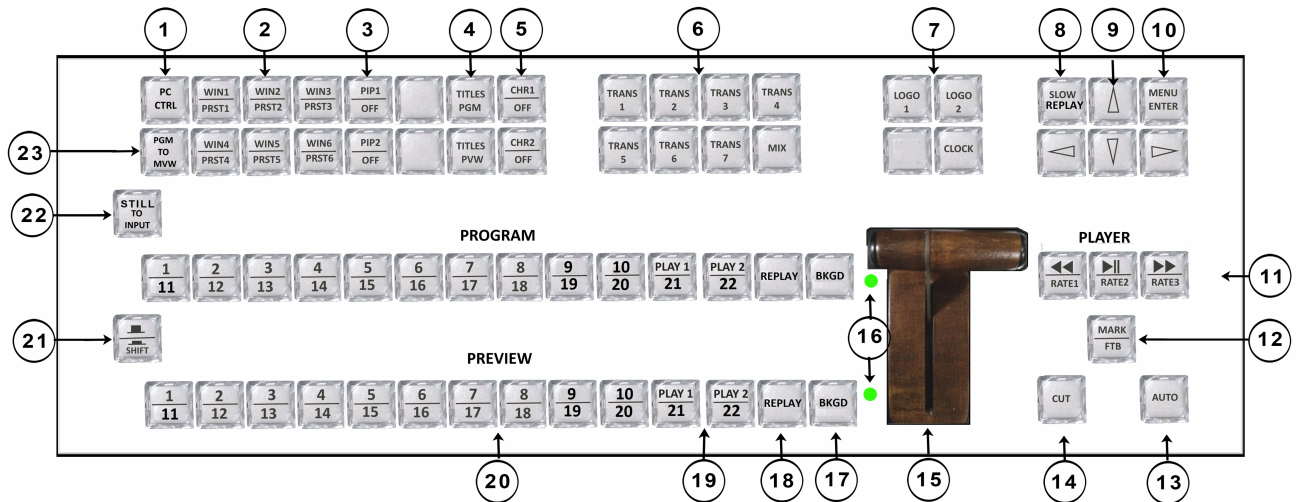
In the window of the "Control Panel Configuration" program it is possible to see parameters of the added Control Panel, a video Switcher and the PC through which is carried out setup. The IP addresses of the Control Panel, a video Switcher and the PC should be in one subnet.

In our example IP of Control Panel -192.168.26.200 and PC - 192.168.26.15 in one subnet, IP of video Switcher-192.168.01.211 does not correspond to their subnet and the Switcher will not see a Control Panel unit.



Respectively it is necessary to change the video Switcher IP address for 192.168.26.15. For this purpose we click with the cursor of the mouse 2 times in the field of "Switcher IP address" and in the opened window we change IP address parameters. After closing the window, the Switcher will connect to the control panel

3.3 Description of the Control Panel unit



Notes:

1. In the description the word "press" means action "To press and release quickly the button". Action "To press and hold" specified in each case separately.
2. The "SHIFT" button is a modifier which is used for expansion of buttons functionality on the Control Panel. If to press and hold this button, then functions of all other buttons of the Control Panel with horizontal underline, change the appointment according to an inscription below the line. Above this line, function of the button work without any conditions.

1. PC Control



The swicher PC control mode.

The possibility of simultaneous control of a video Switcher both from the Control Panel, and from the PC, including settings and a configuration.

In this mode "PC Ctrl" tag appears on the Multi-viewer.

2. WIN 1-6 ----- PRST 1-6



PiP (picture in picture) effects control. (See p. 49)

The WIN1-WIN6 buttons carry out switching on and off of windows of preset PIP and also expeditious change of sources in windows of preset of PIP.

The PRST1-PRST6 buttons by joint pressing with the "SHIFT" button make the choice of the PIP preset which needs to be included

3. PiP 1-2 ----- OFF



"PIP1/OFF", "PIP2/OFF", switching on/off of the PIP1(2) mode on a bottom layer source.

Switching off the PIP1(2) mode on a source on bottom layer is made in advance pressed and holding "SHIFT" button.

4.
Titles PGM

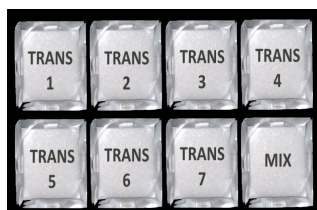
Titles PVW



5.
CHR 1-2
----- OFF



6.
TRANS 1-7,
MIX



7.
LOGO 1
LOGO2
CLOCK

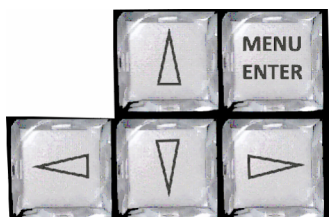


8.
SLOW
REPLAY



9.
CURSOR

10.
MENU
ENTER



Overlay TITLES

For operational management of overlay of titles of any type, the "Titles Preview" button – switching on overlaying the titles on "Preview" output and "Titles Program" button - switching on overlaying the titles on "Program" output, are used.

Mode CHROMA.

The CHR 1/OFF * and CHR 2/OFF * buttons used for the choosing of sources "Actor" and "Background", and at the pressed and holding "Shift" button – for switching on/off of the Chroma 1 (2) mode.

Choice of a special effect

The special effect button "MIX" and 7 "TRANS" buttons to which by means of the "Switcher Control Panel" or "DSC Config" programs the user himself can appoint the necessary effect of transition.

LOGO1, LOGO2 u CLOCK.

Buttons «LOGO1», «LOGO2» switching on/off and quick choice of logos.

Button "CLOCK" - switching on/off digital clock on "Program" output.

Button «SLOW REPLAY»- switching the slowed-down playing of replay system.

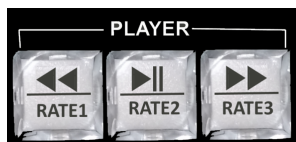
Management of the screen menu

For opening of the screen menu it is necessary to press "MENU ENTER". On the multiviewer the list of parameters, available to setup, will be displayed. Using arrow buttons it is possible to move on menu items and to change parameters.

For storing the changes it is necessary to press "ENTER". If to leave the menu without pressing of "ENTER" - the changed parameters will not be written down.

For an exit from the menu it is necessary to press any button on the Control Panel except buttons in a line "Preview".

**11.
PLAYER**



Buttons of management of a players and speed of switching of effects:

«Return for the beginning»,
«Play/Pause»,
«Choice of the playlist».

In a combination with the pressed "SHIFT" button, the speed of effects of transition is chosen: "RATE 1", "RATE 2" and "RATE 3".

**12.
MARK

FTB**



MARK / FTB (Fade to Black).

Pressing this button does a plot mark in the system of replay.

By pressing together with previously pressed and holding "SHIFT" button, includes transition to the black field - FTB (Fade to Black).

**13.
AUTO**



AUTO,

Pressing this button switches the signal setting on the line PVW to the main output with that speed and with that effect which at the time of issuing the command is turned on the block of special effects.

**14.
CUT**



CUT.

Pressing this button switches the signal setting on the line PVW to the main output without any effects, almost instantly.

**15.
T-Bar**



T-BAR.

The manipulator allows manually make the transition from the signal setting on the line PVW to a "Program" output. The type of transition completely coincides with the "AUTO" command and is defined by effect setting on the block of effects.

In the menu it is possible to select logic of operation of the T-BAR handle of a video Switcher: in both sides (each pass forward, or backward causes switching of channels) or in one side — switching is carried out only by the movement of the handle forward, back — "blank movement".

Switching of channels comes to the end only if the handle is finished till the stop (indication — two LED lighting to the left of the handle).

If returning the T-bar back without having finished at the stop — switching to other channel does not occur.

Finishing LED indicators

Display situation the T-bar handle is in final position

16.



17.
BKGD



For the BKGD (Background) button there is an opportunity to appoint a signal of the color field (color can be adjusted from the computer), or BARS signal (test signal of SMPTE color bars) or BLACK signal (the black field).

BKGD signals also functions as a source (there is a button, but has no window), and have the soundtrack – for Black it is the absence of a sound (MUTE), for BARS signal it is the "tone of 1 kHz" intended for testing and control the level of channels. It is possible to switch on/off tone of 1 kHz to BARS in the "Menu of settings of the Switcher.

18.
REPLAY



REPLAY

Button for switching on replay function

19.
PLAY 1 (2)



PLAYER 1, PLAYER 2

Two built-in players are full videos sources, functions as inputs, have the buttons on the Control Panel and the windows on the multiviewer.

20.
**PREVIEW
PROGRAM**

Lines PROGRAM and PREVIEW

Both lines have an identical set of buttons. "PROGRAM" is direct setting the program to the output and to the multiviewer PGM window:

PREVIEW - the choice of a source on the "Preview" window of multiviewer and on "Preview" output (if that is appointed to one of output).

**21
SHIFT**



Button “SHIFT”

It is used for expansion of functionality of the button. (see note 2).

It is active only in pressed and holding.

**22.
STILL to
INPUT**



Button “STILL TO INPUT”-

The button of quick setting the still picture instead of an input, so called technological still picture.

**23.
PGM to MVW**



«PGM to MVW» - outputting to Multiviewer the full-size image of the “Program” output.

4. Assignment of connectors on the back panel of the Main unit

4.



Video inputs:

RING22 MINI:	- 8 3G HD/SD SDI*	8 BNC connectors
	- 2 HDMI *	2 DVI-D connectors
	- 1 HDMI *	1 DVI-D connector, титры от PC
	- 1 CVBS	1 BNC connector - input for external synchronization (PAL black signal or the 3-level signal of synchronization).
RING22 MIDI:	- 14 3G HD/SD SDI*	14 BNC connectors
	- 2 HDMI *	2 DVI-D connectors
	- 1 HDMI *	1 DVI-D connector, titles from PC
	- 1 CVBS	1 BNC connector - input for external synchronization
RING22 MAXI	- 20 3G HD/SD SDI*	20 BNC connectors
	- 2 HDMI *	2 DVI-D connectors
	- 1 HDMI *	1 DVI-D connector, titles from PC
	- 1 CVBS	1 BNC connector - input for external synchronization

Video outputs **:

- 5 HD/SD SDI*	5 BNC connectors *
- 1 HDMI*	1 DVI-D connector *.

* With support of the enclosed sound.

** On any outputs of the Switcher it is possible to set the "Program", the "Preview", Multiviewer, or any other inputs.

The program can be "Logo Free", "Logo + Titles Free".

Analog Audio Inputs: 2 stereo. 2 connectors XLR (5 pins).

Analog Audio Outputs: 1 stereo. 1 connector XLR (5 pins).

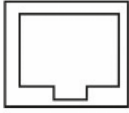
Regardless of option of control of inputs, they always contain embedded audio if available.

To signals on “Preview” or “Program” there corresponds to the soundtrack.



Inputs DVI-D:
Outputs DVI-D:

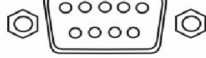
ETHERNET



ETHERNET: The RG45 connector to connect with the PC. Through it the procedure of software updating of a video Switcher, record of logos, a design of a multiviewer, setup and a configuration of a video Switcher, installation of system time from the PC, operational management from the virtual panel is made. For the purposes of broadcasting automation, perhaps remote managements from the computer via the Ethernet interface.

The list of commands and ideology of management is provided for third-party programmers on demand.

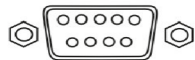
CONSOLE



CONSOLE

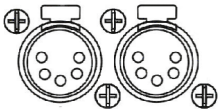
Connector DB-9M for connection Control Panel to Main unit.

TALLY



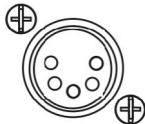
TALLY

Connector DB-15F (10 switchers)



Inputs of an analog audio

4 inputs of an analog audio (2 XLR connectors 5 pin) which can be configured as 4 Mono of an input or 2 Stereo of an input.

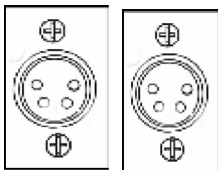


Outputs of an analog audio

2 outputs of an analog audio (1 XLR connector 5 pin)



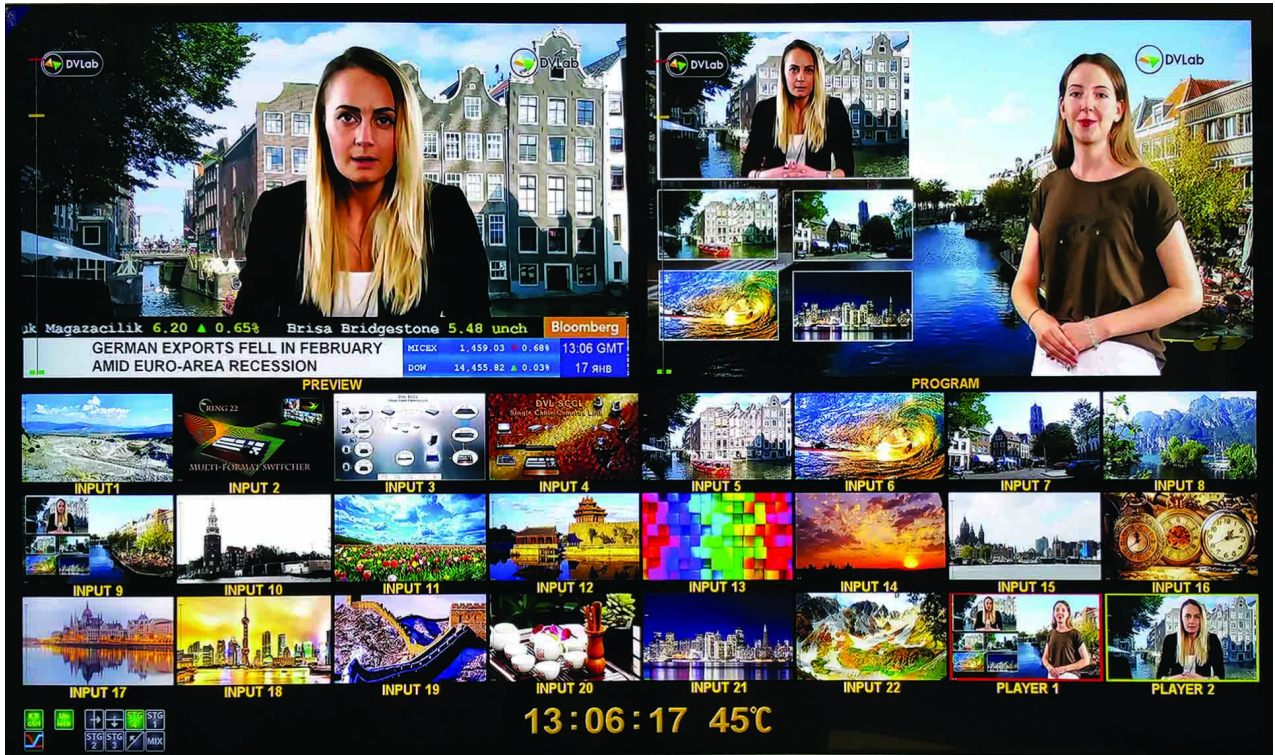
Ground terminal *GND* (Ground)



Two connectors of power connection of + 12 V.

Connectors are equal — for the purpose of reservation perhaps simultaneous connection of two external power sources.

5. Multiviewer.



Multiviewer signal can be sent to any of video Switcher output. Respectively for Multiviewer display it is possible to use the monitor or the TV having an input of DVI-D or SDI supporting resolution 4K or 1920X1080i of pixels at 50 Hz.

When choosing the computer monitor nevertheless it is necessary to check for correct work in mode 4K and/or 1920x1080i 50Hz, it is also necessary to pay attention to a possibility of operation of the monitor in the mode of full display of the screen (PGM to MVW).

The screen contains 24 reduced images of input video signals, and Preview and Program screens. Each of windows has the inscription corresponding for an input. The user can independently change labels under windows of input of the sources, using the "DSC Config" utility which is included in the delivery package for the Switcher.

The multiviewer allows to estimate current state of a video Switcher:

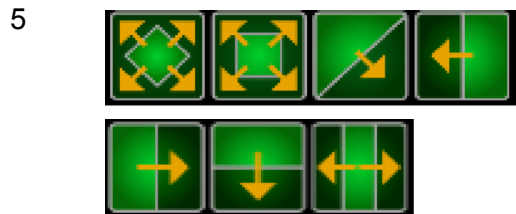
what signals are switched on Preview, Program, what additional signals are putting on an output signal, what signal is ready to delivery to Air, information of audio levels.

Auxiliary information – the current special effect, maintaining from a signal of external synchronization, the current time, the overheating indicator is output to the Multiviewer.

Under each window of an input and also "Preview" and "Program", audio indicators are displayed. These indicators, strictly speaking, **are not measuring devices**, however allow on a test signal rather precisely to expose nominal level according to the EBU Technical Recommendation R68-2000 standard ("Adjusting level in the equipment of production of digital audio and in digital audio recorders").

5.1 Service information on the multiviewer

- 1 Names of channels for windows of inputs and the inscriptions PGM (Program) of PVW (Preview) for windows of outputs
- 2 Indication of the inputs chosen on PGM and on PVW — on PGM signal source window perimeter is red frame, and yellow frame — for the PVW window
- 3 . The screen menu is output over all windows by MENU button on the Control Panel
- 4 Indicators of level of signals of a soundtrack.



Transition WIPE

Type of the current special effect - eight pictures are displayed to the corresponding eight buttons on the Control Panel,

which is used for the quick choice of effects of transition between channels:

Seven adjusted buttons for effects of shutter (WIPE), the animated transitions, "stinger" and one button of the choice effect "MIX". The current effect is marked with illumination.



Transition MIX.

If on the Control Panel the mode of transition MIX is chosen — this picture is highlighted.



Type of audio transition

Indication of type of sound mixing at the program exit like V or type X:

Is chosen in the menu and it is displayed on a multiviewer in the form of two crossed X lines — transition with simultaneous withdrawal of one signal and input of another. Sound support of both channels for the period of transition mixes up, at the same time the level of the current channel smoothly decreases, and the new channel increases.



«V»- switching is implemented with smooth full removal of one signal with the subsequent smooth input of another. To the middle of transition the soundtrack of the current channel smoothly goes to 0, and in the second half of transition the soundtrack of the new channel gradually accrues

9



Work with the personal computer

Information on control of the Switcher: PC CONTROL or CONSOLE CONTROL. The inscription "PC ctrl" appears in case the video Switcher is connected to PC and the PC Control button is pressed.

In this mode simultaneous work of a Switcher both with the Control Panel, and with the program of "the virtual panel".

If the PC Control button is not pressed (does not shine), the video Switcher is in control mode only from the Control Panel. At the Multiviewer there is an inscription "Kb ctrl". Alternate blinking of these inscriptions signals that the control signal is absent.

:



10



OSD CLOCK- The hours displayed on multiviewer and showing the current time.

Indication of HH:MM:SS. Installation of the exact time is made from the PC. It is possible to set automatic synchronization if the Switcher is constantly connected to the PC and the program of management of a Switcher is started.

11



Indications of the sensor of temperature.

There is an opportunity to establish a threshold of emergence of the indicator of temperature.

6. The software delivered in a set.

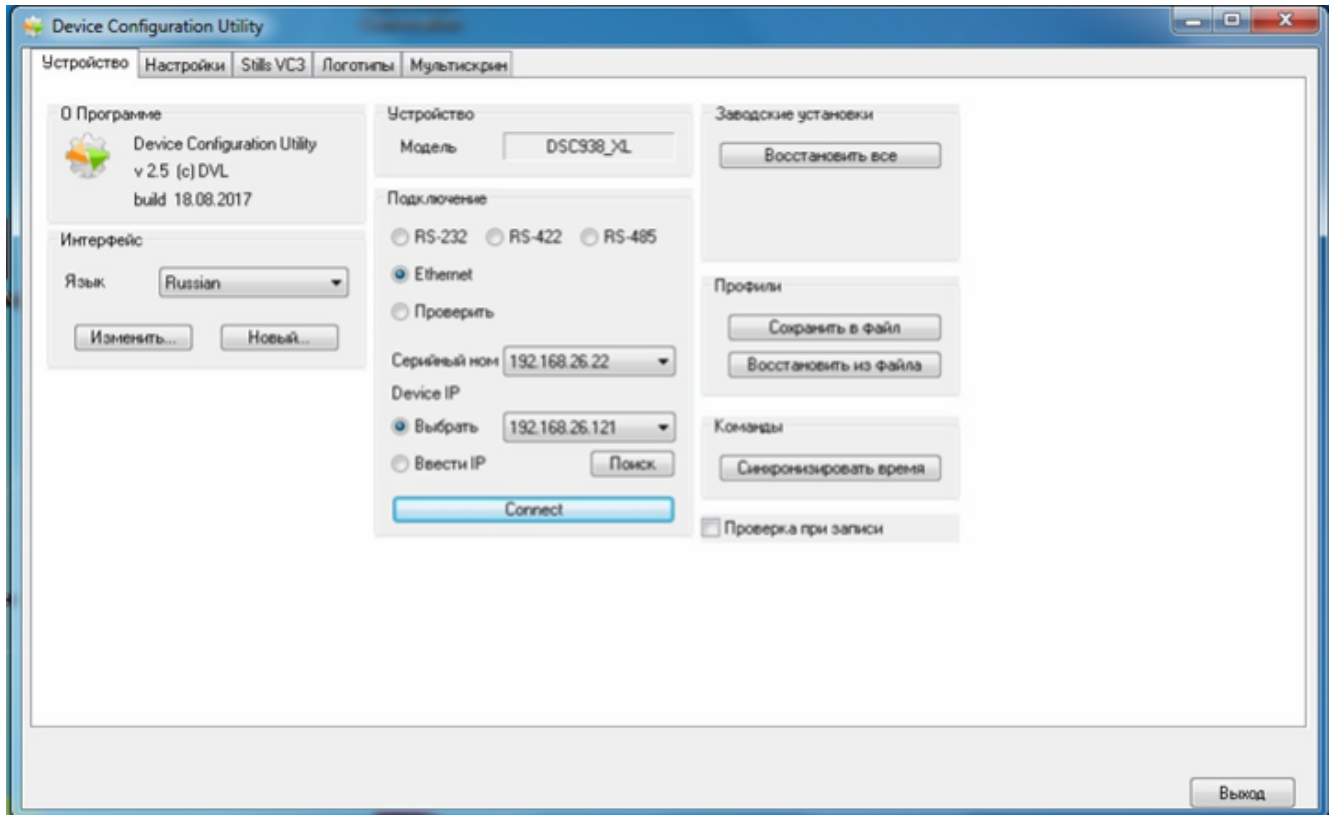
All programs are delivered together with video Switchers and are free.

Also programs and descriptions to them can be downloaded from the website of the producer at the following link

<http://dv-lab.com/ru/tehpodderzhka>

6.1 Program of control of the system “DSCConfig”

It is applied to control of parameters, record of logos and slides and design of a Multiviewer.



6.2 Program «RING-22 Switcher Control»

The important role in work with a Switcher is carried out by the Program of management, deliverable at the set. This program provides full functioning with a Switcher in absence of the hardware Control Panel. Provides setup of parameters of signals of all functions of a Switcher, including forming of difficult combinations of effects, sources. Has built-in Switcher of a sound tract.

The program has the simplest and evident interface, as much as possible simplifies difficult settings, provides saving of an unlimited number of user preferences

The “RING-22 Switcher Control” program includes the panel Simulator (The Virtual Panel):

Allows to operate all functions of "the iron" Control Panel.

Serves for an illustration of the possibility of control of the device from the PC in the systems of automation of Air transmission.

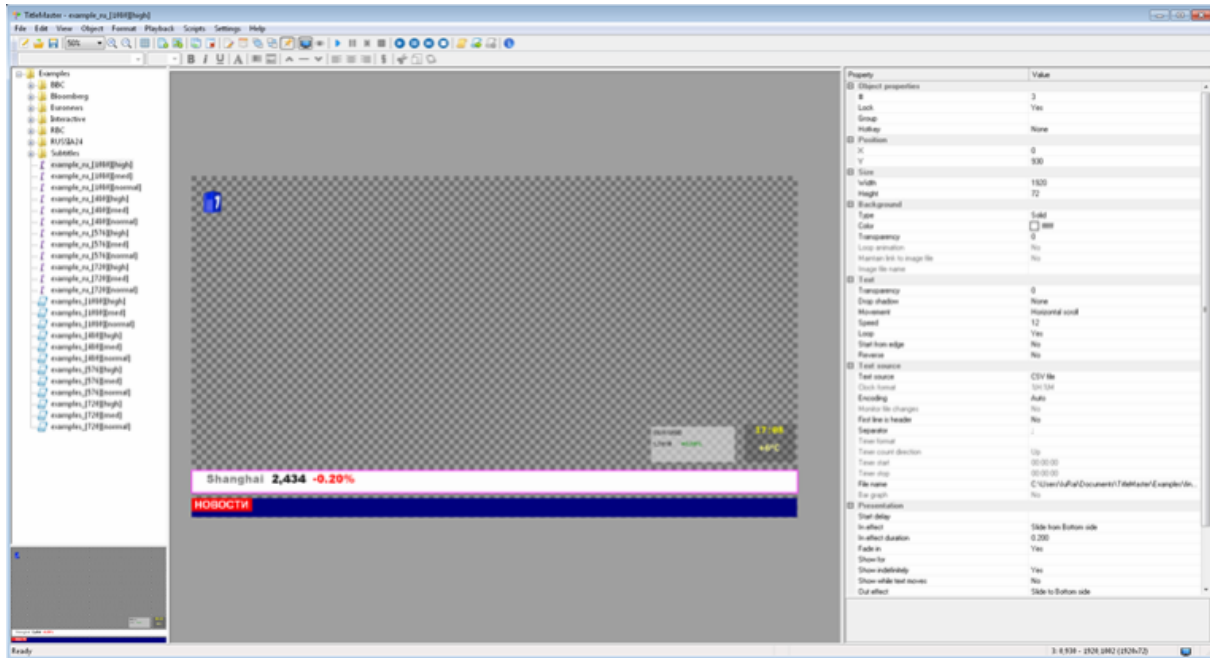
Also the “**Playout HDMI**” program which allows to play video files from the playlist, is built in “RING-22 Switcher Control”.



“RING-22 Switcher Control” also provides settings of the Switcher on inputs and outputs, arrangement of logos, hours, the PiP windows at the “Program” output.

6.3 Program «TitleMaster».

Allows, together with the computer, using for this purpose the DVI-D input of video Switcher, to resolve problems of design and titration of Air output.

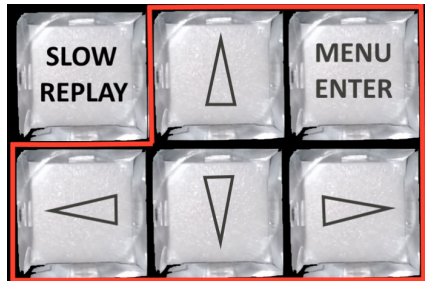


7. The adjustments which are executed from the menu (OSD)

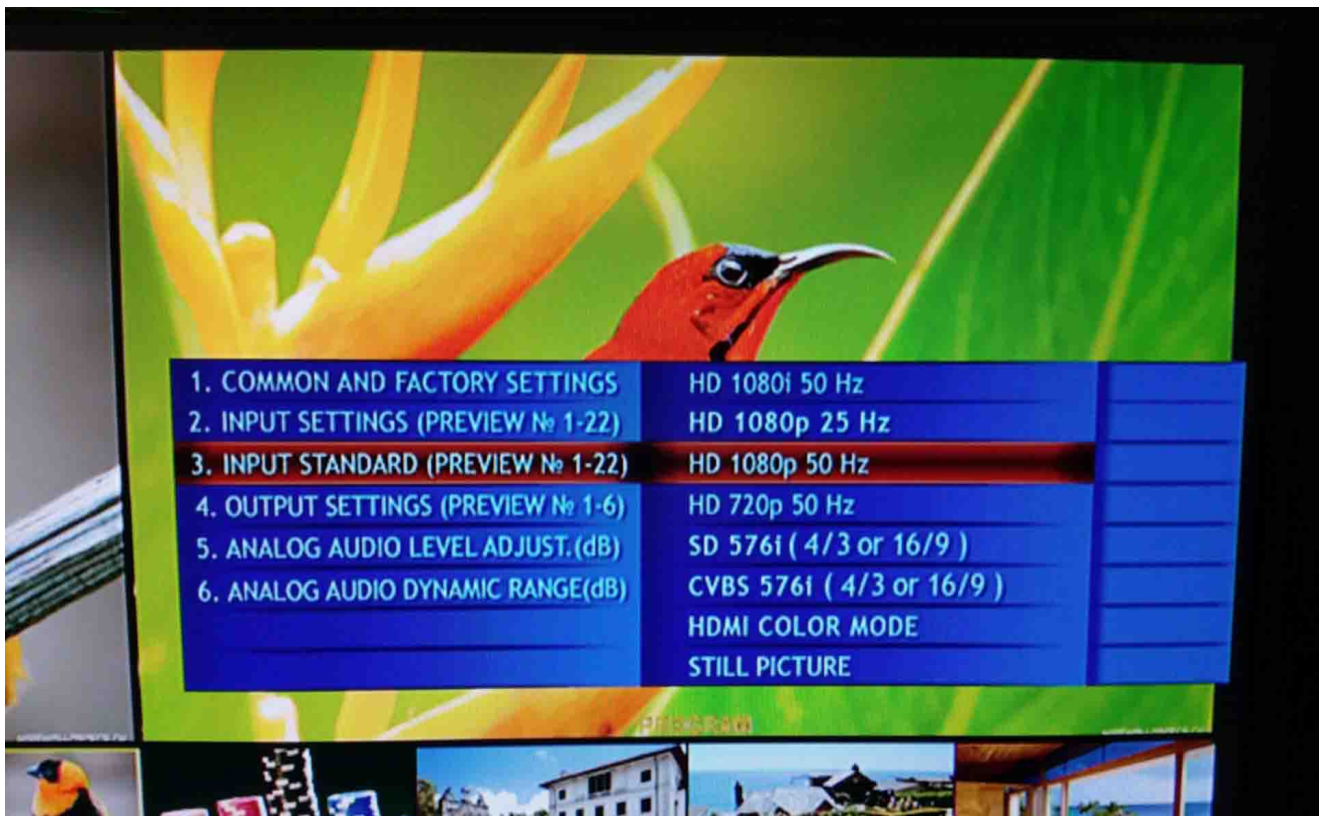
The quick switching necessary for work on air executed out from the DU panel.

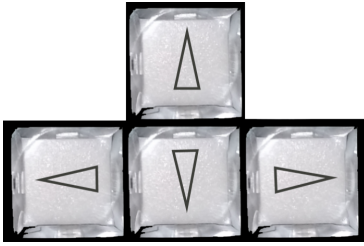
Adjustments and settings which can be required during the daily work of a video Switcher, but, as a rule, not on the Air, are carried out in the Menu on Multiviewer (OSD - On Screen Display).

Seldom used or difficult settings which can confuse the inexperienced user are carried out only from the computer,



For an input in the menu it is necessary to click "MENU/ENTER", at the same time on Multiviewer the picture of the menu settings of a video Switcher will appear:





Buttons with arrows,

allow to move according to the menu and also to choose necessary parameters of a video Switcher.



Button "Enter" - confirmation of the choice of parameter

For an exit from the Menu it is possible to press any button on the Control Panel, except buttons on the line "Preview" and buttons of the block of the Menu.

Line "Preview" buttons with the opened "Menu", allow to choose an input and output which settings need to be configured.

In the Menu of a multiviewer it is possible to carry out the following settings :

1. Choice of an operating mode of the T-Bar : The mode "Two way" - the working course of the handle both forward and backward or "One Way" - the working course only forward, movement of the handle back — idle running.
2. Choice of the source of Audio, for Video source.
3. Settings of inputs:
 - Video format;
 - Contrast;
 - Brightness;
 - Level of a sound tracking ;
 - Associating of an audio signal to video source;
 - Dynamic range AUDIO;
 - Group of the enclosed soundtrack (EMBEDDED AUDIO GROUP),
 - Pair of enclosed soundtrack (EMBEDDED AUDIO PAIR).
4. Settings on all outputs:
 - Video format,
 - Choice of a source of video signal,
 - Dynamic range AUDIO,
 - Group of the enclosed soundtrack of (EMBEDDED AUDIO GROUP),
 - Pair of enclosed soundtrack of (EMBEDDED AUDIO PAIR)
6. Return to the factory settings installations- "Factory Set".

8. Connection of the Switcher to the PC

For connection to the PC the UTP cable with RJ45 connectors is used.

Connection is carried out to the ETHERNET connector on the back panel of a video Switcher



Turning an operation mode from the PC is carried out by the "PC CTRL" button. In this case access to the Switcher is possible both from the Control Panel, and from the PC at the same time.

At the multiviewer there is always information of the current operation mode:

– **PC CONTROL**  or **CONSOLE CONTROL**  .

Detection of the Control Panel, PC or pushbutton station is carried out automatically and the corresponding text is displayed.

If any of external devices unknown, the specified texts are displayed in turn, thereby showing process of search of the active device.

Connection to the PC is required in the following cases:

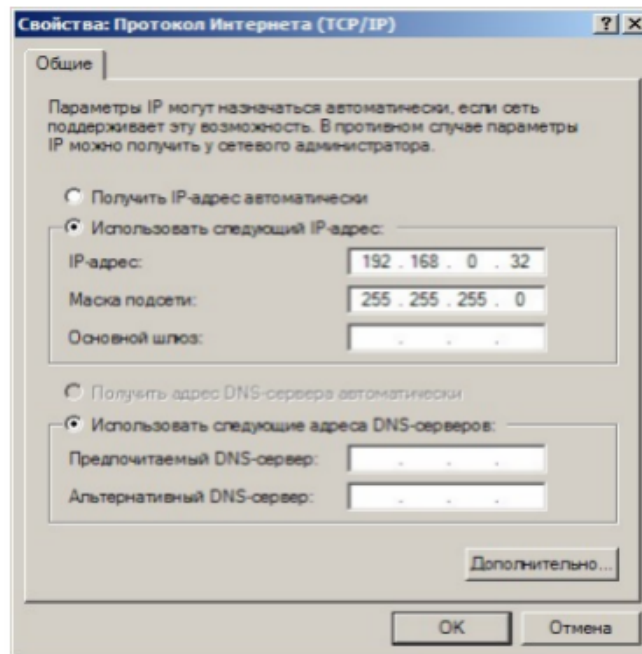
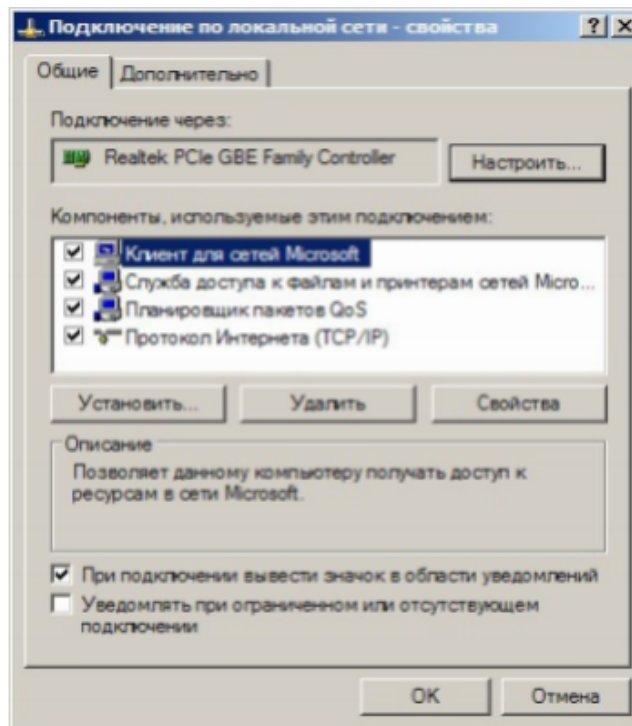
1. Setup of parameters - the program "Device Configuration".
2. Record of logos – the program "DSCConfig".
3. Management - the Program" DSC REMOTE CONTROL" or other (for example, are provided for development on demand).

For connection of a video Switcher to the PC it is necessary to perform the following operations:

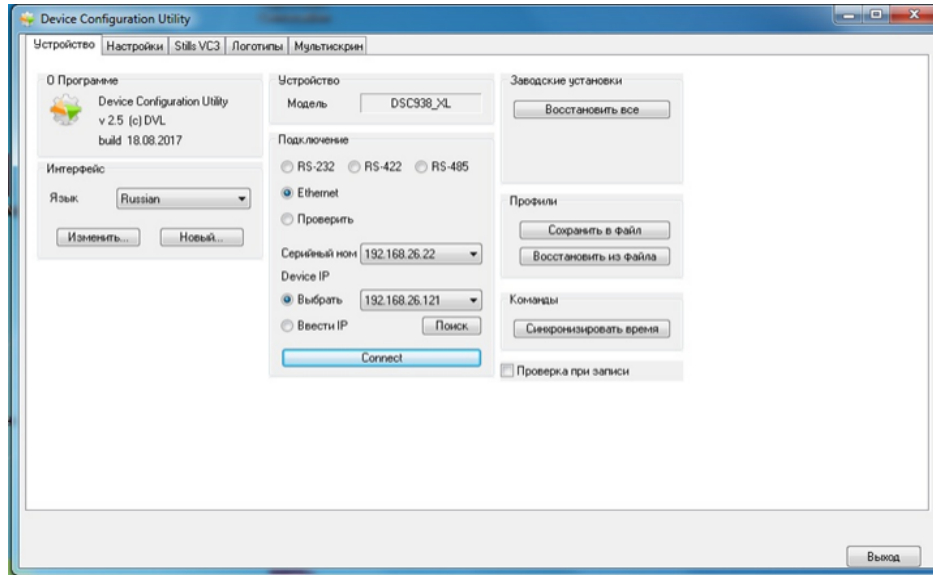
1. Switch on video Switcher.
2. To press on the "Control Panel" the button «PC CONTROL».
3. Connect the video Switcher Ethernet connector to the network connector of the PC through UTP cable directly or through HUB.
4. Define the IP address to which the video Switcher is connected:

In the Windows "START-UP" panel to select:

Connection / Connection on a local area network / property/ the Internet protocol of TCP/IP/property - IP address 192.168.0.32. – (it is for example)



- The work group, in this example 0, the PC address in it – 32.
5. Start the "DSCConfig" program on the PC.



6. Set in connection parameters — Ethernet.
7. Choose the "Select" window.
8. Click the "Search" button and the program will find devices in this network.
If there are more than 1, then it is possible to browse all list, by clicked an arrow below "Select" windows.
9. Select the address corresponding to the address of the video Switcher which needs to be configured.

However, it is possible, that the work group in the address of a video Switcher does not match with group of the PC (in our example group 26), or the address of video Switcher is already occupied with other device.

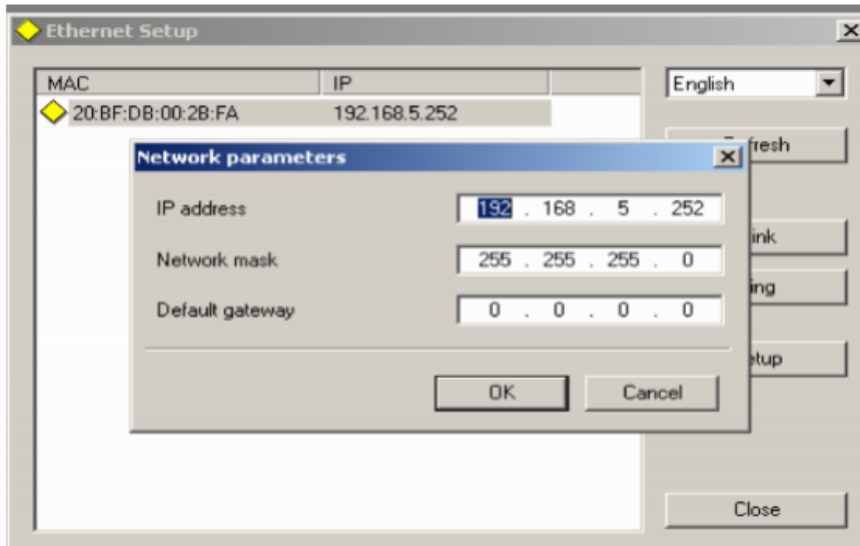
In this case it is necessary to use the "Ethernet Setup" utility included in the installation of "DSCConfig" and to change group and number in the video Switcher address (the click on a line with the address in a window of the utility, will open the corresponding window).

For example the connection IP address PC(to which video Switcher is connected)

192.168.5.32.

in this case the device IP address in the 'DSCConfig' program should be

192.168.5. XX - where XX — any numbers which are not occupied in this network, for example it is 192.168.5.252



Click button "check".

10. If connection is successfully - in the "Model" window will appear the name of the video Switcher – "RING-22"

9. Configuration and setup of a video Switcher by program "DSCConfig".

1. the "DSCConfig" program allows the configuration of the device and upload all of the necessary graphic objects f;

2. Video and soundtrack is regulated absolutely separately. Pay attention that the associating of a soundtrack is made not to channels, but to buttons. For example: The IN1 button selects video input 1, but the soundtrack to this video to an input can be any of the sound signals which came on to video Switcher, as on digital (the embedded sound to SDI and DVI-D), and on analog inputs.

3. Programming of the image of logos and font of hours

The font of clock is drawn within character location of the logo (256x192 pixels) divided into sections (16x24) for each of digits.

For an output of clocks to the Air and on a multiviewer separate fonts are used. Change of font of clock on a multiviewer is unavailable to the user (only recovery of all design of the Multiviewer at once)

4. Texts for multiviewer windows.

Change of the name of an input causes rewriting of a part of a design of the Multiviewer. For texts the system Windows fonts, with the choice of the size and color of a font are used.

In the program it is possible to make the following tunings.

1. Choice of an operation mode of the video Switcher HD-SD.
2. Setting channels for transmission of the sound to the SDI output.
3. Soundtrack associating to buttons of the choice of an input.
5. Device upgrade
6. Logos and still pictures upload.
7. Outputs setup:

- a) Program output (PGM).
- b) Preview output (PVW).
- c) Program output without logos (Logo Free).
- d) Program output without titles and logos (Titles Free).
- e) A signal from any input of the video Switcher.

All settings can be saved in the user's profile and in case of need it is possible to replace all settings for, in advance prepared, very quickly.

10. Control of internal temperature of the Switcher.

It is known that all electronic devices, and first of all with processors inside, during the work emit a quantity of heat. For normal functioning of a system it needs to be taken away, providing optimum temperature condition. This task considerably becomes complicated with Summer heat, when standard cooling systems can not handle it any more, especially in cases, if cooling systems failed.

The result of overheating can be both a full refusal of a Switcher out of operation, and the permanent instability of a system, which is expressed in emergence of strange errors, pending and sudden reloading. Not to allow so unpleasant effects, it is necessary to keep temperature of components of a Switcher under control.

Heat extraction task is not only for the producer of the equipment, but also technicians of studio. As producer, we counted optimum construction of the case and used almost silent, but powerful fans. And for the aid to technicians we provided the temperature sensor which is installed in the case of a Switcher and which allows to trace Switcher's working temperature, also there is indicator of the current working temperature of a Switcher.

Normal working temperature of a Switcher is up to 64 C.

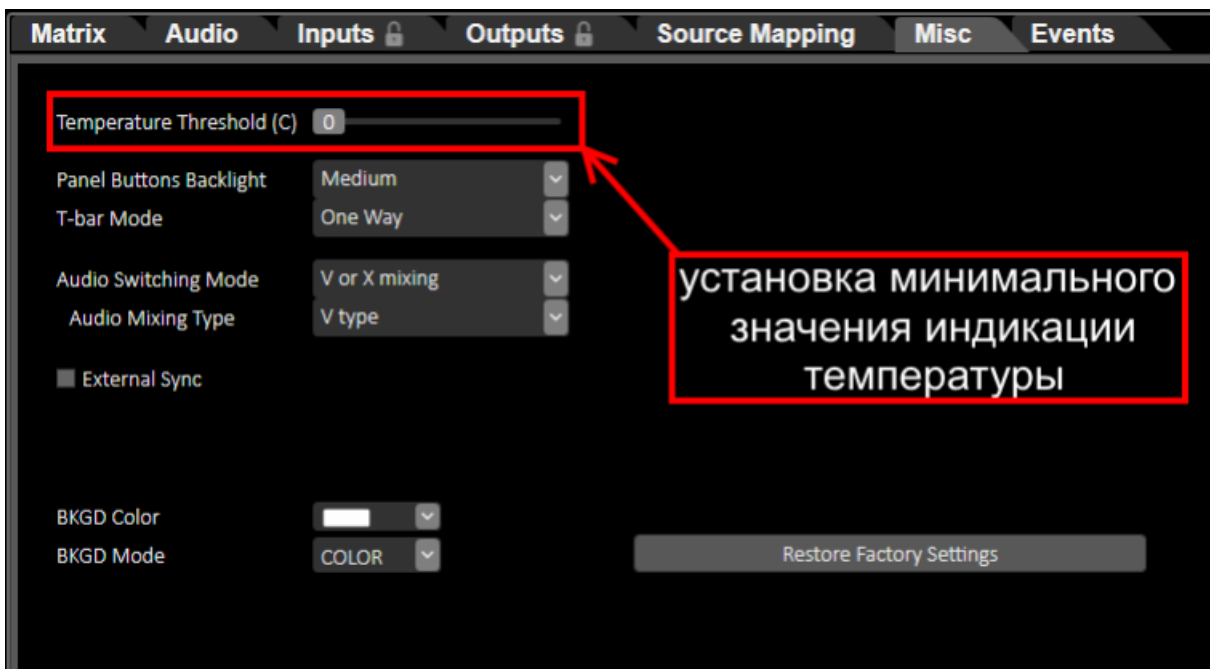
If the current working temperature of a Switcher exceeds 64 C, then on the Multiviewer indication of the current temperature will appear in C, at the same time the C icon will be displayed in red color.

If the working temperature of a Switcher increases, digits on the temperature indicator on the Multiviewer will change according to its value.

In this case the user who works with the Control Panel of the Switcher should pay attention of technicians, for clarification of the reason of overheating of a Switcher and its elimination.

If the working temperature of a Switcher falls lower than 65 C, then indication of the current temperature of a Switcher will automatically be switched off.

If the technicians want to make secure and see indication of the current working temperature of a Switcher on a Multiviewer earlier than it will reach 65 C, then it can itself, using the program of management of a Switcher with the PC, set value of temperature of a Switcher at which the indicator of the current working temperature of a Switcher on a multiviewer automatically will turn on.



The minimum value which can be set independently in program is 0 C. At the same time indication of value of temperature and the C icon on the multiviewer will

be displayed in yellow color

50 °C

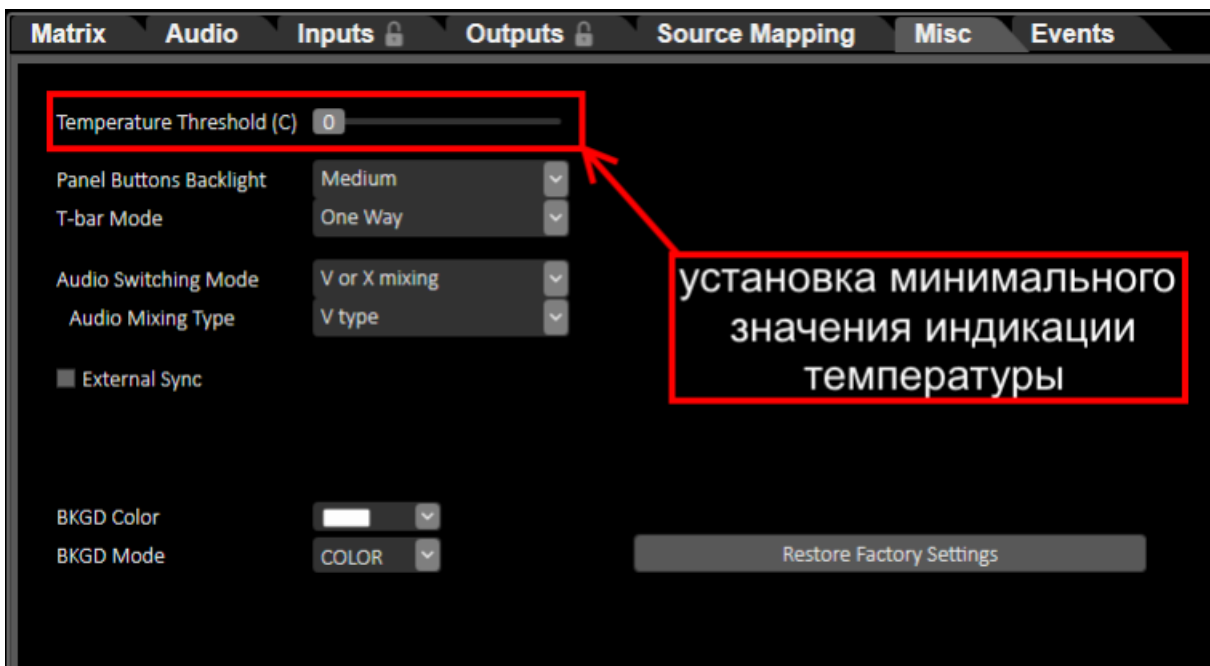


Fig. Installation of the minimum value of indication of temperature.

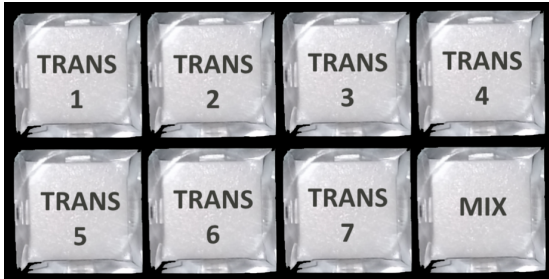


If in the process of work, the current temperature of a Switcher reaches 65 C and above, then indication of the C icon will exchange from yellow to red.

It will mean that temperature of a Switcher exceeded the normal working temperature of a Switcher and it is necessary to define the reason of overheating and to eliminate it.

Also, pay attention, that the Switcher making "logs", in other words all cases of exceeding of normal temperature condition of a Switcher will be fixed and, at if it will be necessary, the producer will be able to read this information to define the cause of Switcher's defect.

11. Transitions-Effects.



Buttons of special effects of transitions

RING-22 has 7 programmable by user "TRANS" buttons (Transition) to which it is possible to assign from the PC effects of transitions of "WIPE", "STING" and button 'MIX' (effect of "Dissolve" - "Dissolution").

Transitions can be executed manually by using the T-Bar handle or automatically by using of the CUT and AUTO buttons.

In the "RING-22 Switcher Control" program it is possible to assign the effect of transition to each of 7 "TRANS" buttons, it is also possible to configure color and width of border for all effects of transitions.

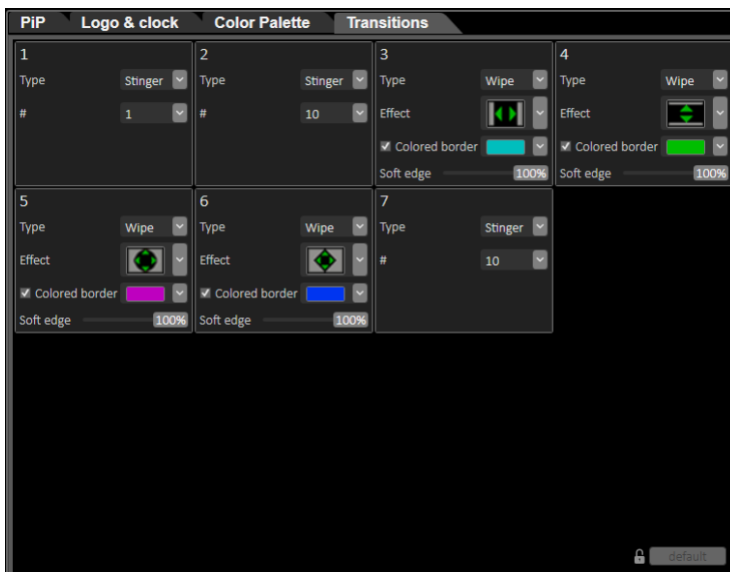
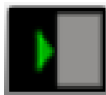
























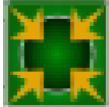








Fig. Panel for control of Transition special effect

View of “WIPE” effect	Icon of “WIPE” effect On Multiviewer	Description of “WIPE” effect
		Vertical Shutter from Left to Right
		Horizontal Shutter from Top to Bottom
		Vertical Shutter from the Center to Left and Right
		Horizontal Shutter from the Center to Top and Bottom
		Shutter “Circle” from the Center to Outside
		Shutter “Rhomb” from the Center to Outside
View of “WIPE” effect	Icon of “WIPE” effect On Multiviewer	Description of “WIPE” effect
		Shutter “Square” from the Center to Outside
		Diagonal Shutter from the Left Upper corner to the Right Lower corner
		Vertical Shutter from Right to Left
		Horizontal Shutter from Bottom to Top
		Vertical Shutter from Left and Right to Center
		Horizontal Shutter from Top and Bottom to Center

		Shutter "Circle" from Outer to the Center
		Shutter "Rhomb" from the Outer to the Center
		Shutter " Square" from The outer to Center
		Diagonal Shutter from the Bottom Right Corner To the left Top Corner

12. Logos

The Switcher has an opportunity to mix in the output signal simultaneously, up to two color images, the maximum sizes is 256x128, and 128x256 (horizontal and vertical) pixels.

These images can be logos of the channel, or special tags (Live, "Repetition", etc.), further in the text we will call them logos: Logo1 and Logo2



Buttons of switching on/off of logos visible on the Control Panel

Total number of images which can be stored in the device – 7 static and 1 dynamic. Replacement of images of the logos, which are switched on by the Logo 1 and Logo 2 buttons, to the images which are stored in memory of the device is carried out directly from the Control Panel.

The images of logos included into the video output signal of the device are stored in a non-volatile memory and recording in it from the PC by the specialized "DSCConfig" program, which is included in the delivery package.

Creation of logos

Creation of a logo can be made by any graphics editor, with the subsequent converting of the drawing in a format of DSC devices, by specialized "DSCConfig" program, which is included in the delivery package.

Operational replacement of logos from the Control Panel unit

- Press and Hold button "LOGO1" ("LOGO2") on the Control Panel. As a result:
 - the logo in "Program" will be switched off,
 - the current logo will be displayed on "Preview"
 - all buttons of the panel, except 8 buttons (1-8) on the line "Preview" will go out. One of these buttons will blink, specifying the number of the logo selected at that moment
 - Continuing to hold the "Logo1" button ("Logo2") and clicking in turn buttons 1-8 it is possible to try all available options of logos - they will be displayed in the Preview window.

Stopped on the necessary logo, it had to release the "LOGO1"/"LOGO2" button, as a result the system will pass into an operating mode with the new selected logo.

Switching on/off a logo at the "Program" exit - by short clicking of the Logo1 or Logo 2 buttons.

13. SLIDES

In "RING-22" there is an opportunity, for each input to be replaced with a slide. Slides - still images which can be used as a signal source — a caption screen or a technological signal, when checking the system for absence of external sources. Slides recorded in a non-volatile memory of the device from the PC on Ethernet using of the "DSCConfig" program.

As a slide any image of the JPEG, BMP, PNG, TGA format of 1920x1080 pixels, 24 bits in size can be used.

The slide has all properties of an input - is entered on PVW and PGM and is given On Air by the "CUT"/"Auto" buttons, or by T-Bar.

Switching on/off slides.

Technological slides turned on as follows:



1. Press and Hold the «STILL TO INPUT» button.
2. Continuing to hold the "STILL TO INPUT" button, to click the button of the necessary input at the line "Preview". As a result:

Meanwhile the choice will be confirmed on Multiviewer where in a window of the selected channel the written image will be shown.

3. To switch off technological slides, it is necessary to repeat the actions described in item p.1-p.2.

Selecting the picture for technological slides

Pictures (only 24) for technological slides are loaded into a non-volatile memory of a video Switcher with the PC by using of the "DSCConfig" program (in more detail in the section "**Record of Slides and Logos in Memory of the Device**").

1. Click the button with necessary input, with the included technological slide, on the line "Preview";
2. For choosing of a necessary slide, the player control buttons are used.



("rewind" of slides to the left) and ("rewind" of slides to the right), which "rewind" the slides written previously in a non-volatile memory of a video Switcher.

Record of slides and logos in memory of the device

For record of slides and logos in memory of the device, the LAN connector which is on the back panel, is used.

The PC is connected to this connector.

On the PC it is necessary to install the "DSCConfig" program which is a part of delivery. Write process is described in documentation on the program.

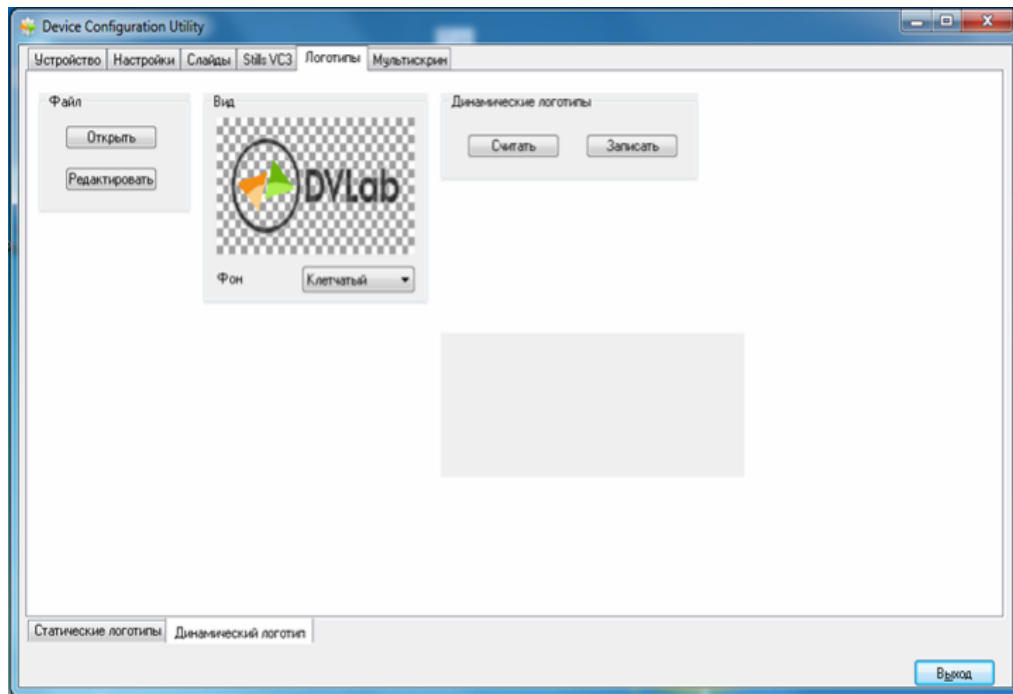


Fig. Record of logos by using of the "DSCConfig" program.

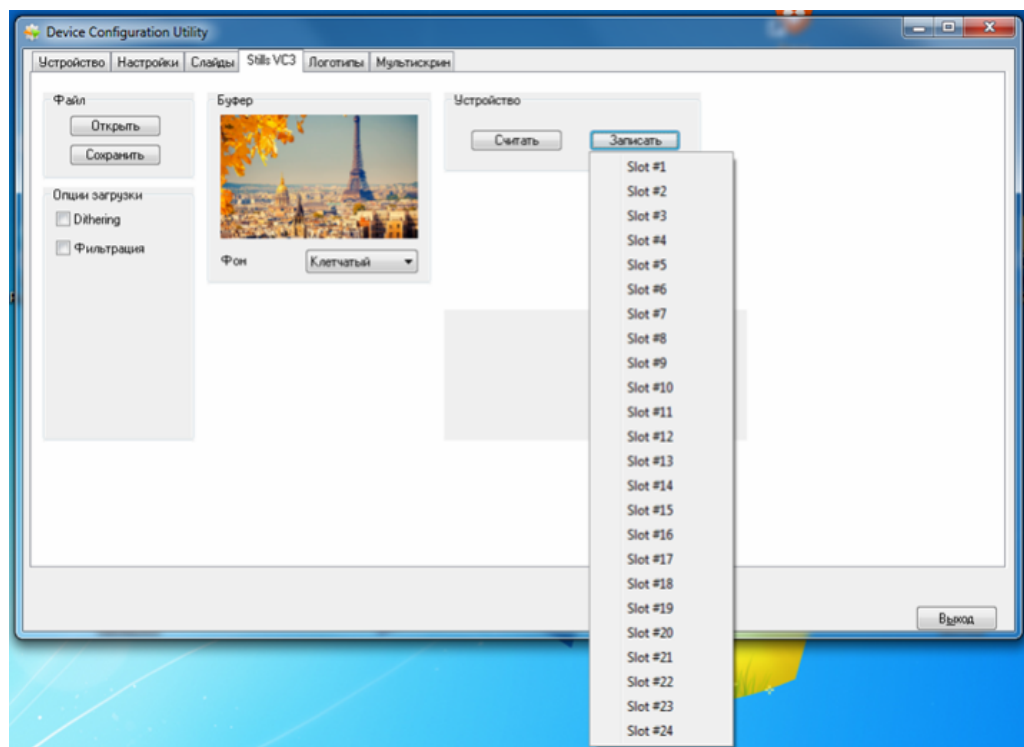


Fig. Record of slides by using of the "DSCConfig" program.

Important! Record of slides and logos cannot be made during broadcasting.

14. The player of media files on the SD card.

In a video Switcher RING-22 the player of media files on the SD card is implemented. For record on the card the format of VC3 files is used.

VC3 - DNxHD ([Digital Nonlinear Extensible High Definition](#)) — **format with losses compression of video of high definition.**

Record of files on the card is carried out by the "SD Card Manager HD" program which are in the delivery set to a video Switcher.

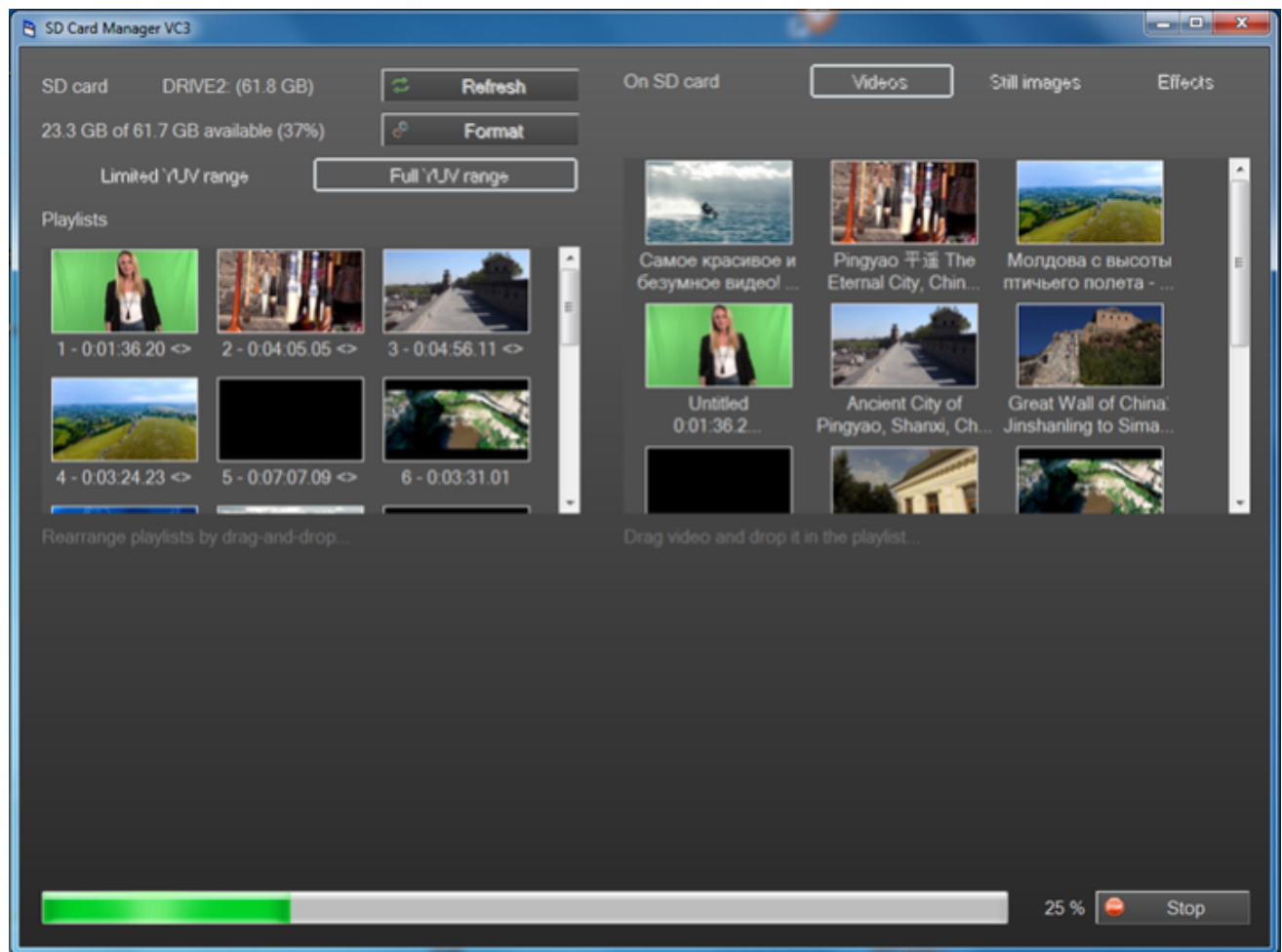


Fig. Program «SD Card Manager HD»

Practically any format of media files is suitable for record for the SD card. The program itself will transform and writes on the card the file in the necessary format.

On the card it is possible to write files and to create playlists (up to 16 playlists).

The video Switcher allows to replay files by two flows simultaneously. For this purpose on the card it is possible to create some playlists whom it is possible to select two and they will be played at the same time, or in turn.

For control of the reproduced files each player has on a multiviewer the window "Play1" and "Play2", and on Control Panel the buttons "Play1" and "Play2".

Control can be done only of that player which is set on "Preview" at present!

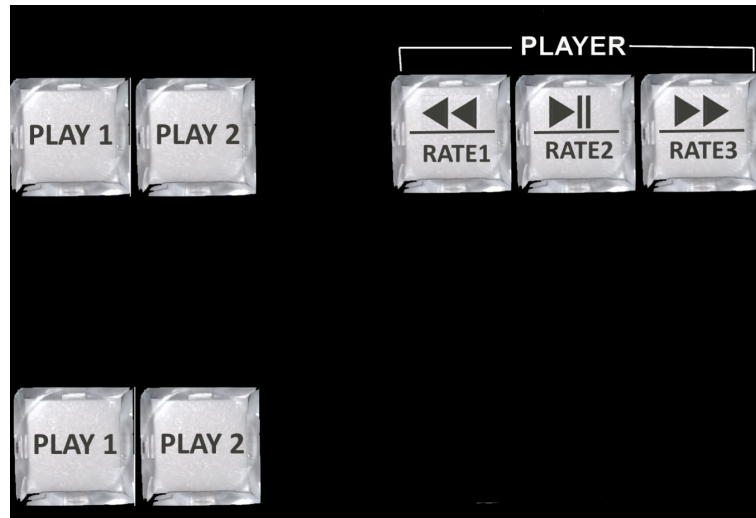


Fig. Control buttons of players.

Management of the built-in players:

- 1) Set the necessary player on "Preview"
- 2) Click "Player1" on the line "Preview" - in the "Preview" window the first frame of the current plot appears.
- 3) *Control of the playing can be done by standard buttons: "Start / Pause", "Return for the beginning" and "Choice of the playlist".*



«Return for the beginning»



«Start / Pause»



«Choice of the playlist»

- 4) The "Choice of the Playlist" button to select the playlist, necessary for playing, looking at the first frame of the plot, which will appear in the "Preview" window by each clicking at the button of choice. Playlists are selected around by each clicking of this button (if there are only two, then just one playlist replaces another)



5) Return for the beginning will be, when clicking that button, if the plot is not on the first frame. If the plot on the first frame, then clicking of the same button leads to transition to the first frame of the previous plot. It is necessary that the director could select the beginning of a plot in order, not necessarily from the first frame.



6) Clicking that button, it is possible to check playing, repeated clicking this button stops playing of a plot. In such a way it is possible not only to control a plot, but also to adjust the beginning of playing.

At signal output in the "Program", playing begins any way (CUT or AUTO) automatically from the frame which sets on "Preview". The single plots (not looped) that are finished, automatically goes on "Preview"

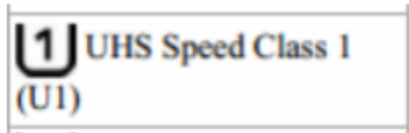
. Similarly for management of the Player 2.

Attention!!!

For record it is possible to use SD cards only of UHS (Ultra High Speed) — the high-speed data exchange protocol.

Other cards will not work!

For cards of the UHS standard the high-speed class is marked by number in letter U



For an example:



Record on the card is made with a speed of 120 Mbit/sec.

It is possible to use cards 16,32,64,128, 256 GB.

15. CHROMA KEY (Electronic PiP projection).

The Electronic Pip projection (PiP) is method of getting the combined television picture at which a part of one image (background picture) which in terms of television is often called "back" is replaced with other image (foreground picture).

The main image is photographed on a special background. Then color of this background is removed from a signal, and to the place of a background the second image (a background which is like behind the "actor"), is inserted.

It should be noted that the quality of the received combined image depends on from the number of the factors, which are not connected with the PiP hardware. First of all, from good and correct lighting. The second most important factor is qualities of a background which should be monochrome, evenly colored and lit. It is necessary to monitor that at clothes of "actor" there was no color of a background. The fact, that in this mode the "glaring", brilliant, fine- grain details, etc. should not be used is also important. Theoretically, color of the background used in PiP can be any, the main thing that it did not match color of what is used by "actor" in the foreground. It is considered to be that the best result turns out on a green or blue background.

General statements.

The video Switcher supports up to two independent signals of "Chroma Key" at the same time.

Signals of "Chroma" functionally completely correspond to any of sources.

- 1 Can be seated on "Preview";
2. Can be switched through "Auto", "Cut" or T-Bar in "Program";
3. Can be mixed as among themselves, and with any other sources.

For work with "Chroma" on the Control Panel there are 2 buttons



The "CHR1/OFF" and "CHR2/OFF" buttons serve for switching on/off of the "Chroma 1" (2) mode and for selecting the sources of "Background".

Both channels "Chroma" are identical, therefore we will consider system operation on the example of "Chroma 1"

Switching on the "CHROMA1" mode can be made as follows:

1. Make sure that "CHROMA1" mode is switched off. At the turned on "CHROMA" mode the "CHR1/OFF" button lights in green color. If "CHROMA1" mode is turned on, then it should be switched off:
 - 1.2 Press and hold the "SHIFT" button, the "Chroma1" button will begin to blink.
 - 1.3 Click "CHR1/OFF" with the pressed and holding "Shift" button the "Chroma1" button will go out.



Example of illumination of buttons of the "CROMA" mode

2. On the line "PREVIEW" of the Control Panel we select the source containing a foreground picture (as a rule, on a green background, further call it "Announcer"). For example 9- this image appears in the Preview window, and the 9 button on the line "Preview" will begin to shine



3. We press and hold "CHR1" - all buttons of the Control Panel will go out, except the buttons on the line "Preview", and button 9 will shine red, indicating that this source is selected as "Announcer".

4. Holding the "CHR1" button, we select on the line "Preview" a source with the image of a background (further "Background") on which there has to be put on signal "Announcer", for example "Player 1" - the button of the selected source will begin to blink in green color.

5. At button release of "CHR1/OFF", in a window of source "9" on which there is "Announcer" it is possible to see already created "Chroma" signal.



6. Switching off "Chroma1" mode take place when clicking the buttons "CHR1 OFF".

"CHROMA2" switched on/off just like "Chroma1", only instead of the "CHR1/OFF" button the "CHR2/OFF" button is used

After doing "Factory setting" command, the Choma1 (2) mode is switched off, "Actor" is not selected.

16. Overlaying TITLES

Overlaying of TITLES for the output signals of a video Switcher (PGM and PVW), it is possible by using of the hardware-software "Title Master" module (the DVI-D input) or "Linear Key" (Fill and Key).

For work with the "Title Master" program (the free program from "DV Lab") "Titles IN" DVI-D an input of a video Switcher and the PC with HDMI an output on the video card is used.

For delivering of titles by using of "Linear Key" (Fill and Key) it is possible to select one of the following pairs of SDI of inputs of the Switcher: (IN1Fill) - (IN2Key), (IN3Fill) - (IN4Key), (IN7Fill) - (IN8Key), (IN9Fill)-IN10 (Key), IN13(Fill) - IN14(Key) and IN15(Fill) - IN 16 (Key).

For operational management of overlaying of titles of any type, the "Titles PGM" and "Titles PVW", buttons are used.



"Titles PVW" (switching on/off of overlaying of titles on the "Preview" output)



and «Titles PGM» (switching on/off of overlaying titles on the "Program" output).

The image of titles is not followed by a soundtrack even if it is available in an original signal. It is possible simultaneous overlaying of the PiP preset (up to 6 windows) and Titles on video output signal of video Switcher.

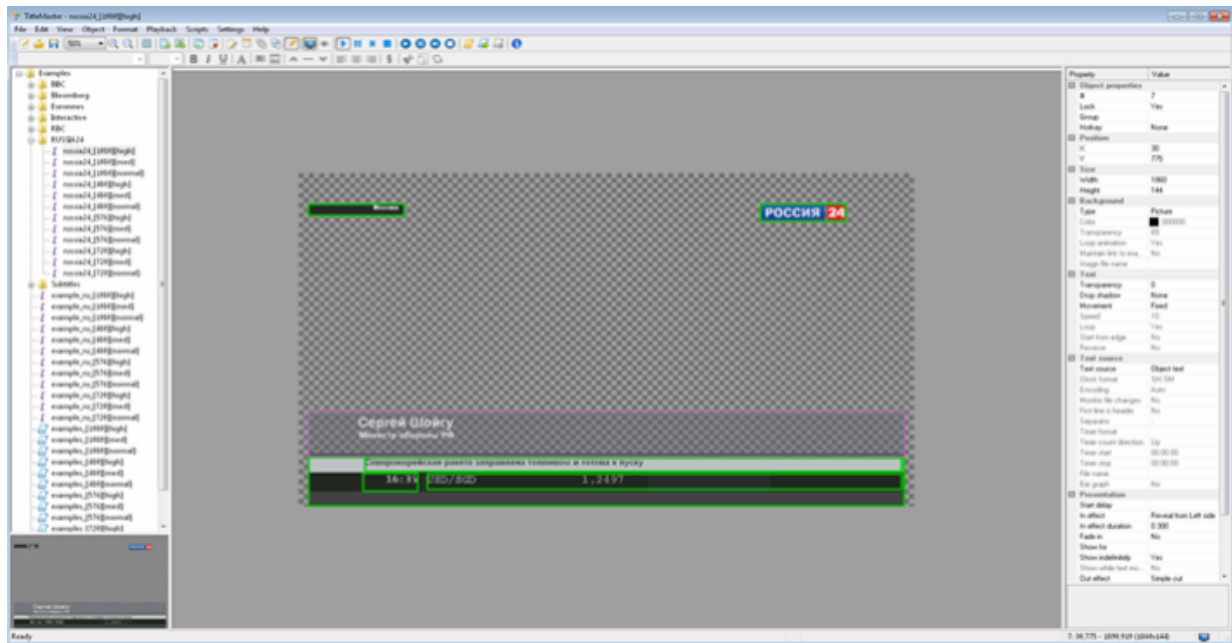
16.1 Work with the hardware-software "Title Master" module

Turning on the mode of titles through "Titles IN" DVI-D a video Switcher input.

1. Make sure that the mode of titles of "Linear Key" (Fill and Key) on any pair of inputs - (IN1Fill) - (IN2Key), (IN3Fill) - (IN4Key), (IN7Fill) - (IN8Key), (IN9Fill)-IN10 (Key), IN13(Fill) - IN14(Key) or IN15(Fill) - IN 16 (Key) is not switched on.

If the Linear Key mode (Fill and Key) is switched on, then it should be switched off.

2. Connect a cable with HDMI to an output of the video card PC, on which it is set the "TitleMaster" program to "Titles IN" DVI-D of video Switcher input;
2. Start the "TitleMaster" program on the PC.



Program "TitleMaster".

The complex is intended for design of video transmission and includes the PC with the installed "TitleMaster" program and "RING-22" video Switcher. The complex allows to display text information "creeping line" or "drum" (the quantity of "creeping lines" is not limited), logos including dynamic (the quantity and the sizes are not limited), to play video (the size can be any) with a sound, different substrates and various pictures for design of the channel, with transparency.

System requirements to the complex

Windows XP, Windows Vista или Windows 7. CPU no less than 2,5GHz, RAM 1GB, DirectX 9.0 version June 2010 or newest.

The video card with two outputs (the second output – with connector DVI-D), with support of DirectX 9, textures up to 2048x2048 in size. Any not too old video card ATI/AMD or Nvidia with a memory size from 500 MB and more. Or built-in graphics of Intel HD.

It is possible to import files: 16 BMP. TGA (with the alpha channel if it is). PNG (with the alpha channel if it is). JPG GIF (with transparency if it is).

For animation it is possible to use:

The animated GIF (time of demonstration of each frame undertakes from the file).

AVI (with the alpha channel if it is, time of demonstration of each frame is set by file frame rate).

TXT – the text file in which every line sets the picture file name for the next frame (it is allowed to specify a full path) and, through a semicolon, time of demonstration of a frame in ms. If time is not specified, for a frame 20 ms undertake.

For video it is possible to use those formats which are played in a system through standard “Media Player”.

TEXT – the text, allows different fonts, the sizes, outlines, change of color of letters and a background.

Transparency of the text it is possible to change from 0 to 100%.

The text can be motionless, running line or a “drum” with the set of speed of scrolling. In case of the mobile text, after scrolling, the text can either stop, or go in cycles.

The number of a frames with the mobile text - is not limited

The program allows to load files in ANSI/OEM encodings (for example: Win-1251), UNICODE and UTF-8.

The encoding of the file is defined automatically, or is selected manually.

For the moving text, all CSV file, for motionless – one current line, is used.

More detail is in the separate description, which can be downloaded from the website of the producer at the following link: <http://dv-lab.com/ru/tehpodderzhka>

16.2 Turning on the mode of titles “Linear Key” (Fill and Key).

1. Connect a cables from SDI outputs of the video card of PC on which the program for titration is installed, to SDI inputs of video Switcher

SDI output of the video card with a signal of "Fill" and SDI output of the video card with a signal of "Key" to SDI inputs for signals of "Fill" and "Key" (to select one of couples of inputs - (IN1Fill) - (IN2Key), (IN3Fill) - (IN4Key), (IN7Fill) - (IN8Key), (IN9Fill)-IN10 (Key), IN13(Fill) - IN14(Key) or IN15(Fill) - IN 16 (Key);

2. Press and hold the TITLES PVW button — all buttons, except buttons 1-2.3-4.7-8.9-10.13-14.15 - 16 on the line PREVIEW will go out;

Buttons of sources will lights the following flowers:

Buttons for signal sources of "Fill" - green color;

Buttons for signal sources of "Key" - red color;

3. Click one of buttons of sources "Fill" 1,3,7,9,13,15 - it will begin to blink, specifying that the mode of titles is turned on.

Note. Turning on the buttons of sources "Fill" 13 and 15 can be done with holding button “SHIFT”.

Note. At switching on mode of titles through "Linear Key" (Fill and Key), **the mode of titles through "Titles IN", DVI-D input will automatically be switched off.**

3. Start the program for titration on the PC.

Switching off the mode of titles of “Linear Key” (Fill and Key).

- Press and hold the "TITLES PVW" button — all buttons, except buttons 1-2.3-4.7-8.9-10.13-14.15-16 on the line PREVIEW will go out;

- Continuing to hold "TITLES PVW" – to click the blinking button – it will finish to blink.

Note. Turning off the buttons of sources "Fill" 13 and 15 can be done with holding button “SHIFT”.

Layout the Titles

1. If the mode of titles is turned on, then pressing the "TITLES PGM" or/and "TITLES PVW" buttons will laydown titles on an output signal of "Program" or/and on a signal of "Preview".

17. PiP (picture in picture)

Presets PiP, prepared on the PC in the program "RING-22 Switcher Control Panel" and remain in memory of a video Switcher. Preset PIP is the construction containing up to 6 pictures against the 7th image - the background. As a background any input can be selected (the slide instead of an input, or players of video Switcher)

Ready to use preset has all properties of an input: It is possible to see it in a background source window, respectively it has buttons for choice on the lines "Preview" and "Program". It can be mixed with other sources and etc.

Same preset PIP, but with different enclosures of windows and different backgrounds (Background), it is possible to assign to two inputs and to switch respectively between these inputs using "CUT" or "AUTO".

In all, the presets prepared for layout on the bottom layer (Background), there can be 6:

Two large windows with the maximum sizes of the full screen and 4 small windows with the maximum sizes of one quarter of a full window.

It is possible to configure the following settings of the PiP windows:

Size; Crop; Color and width of the border; Location; Signal source.

From the Control Panel of the Switcher it is possible to turn on quickly 6 PiP, which was previously prepared (6 buttons on the panel - Preset 1 – Preset 6)

Operational management of display of the PIP windows can be done from the Control Panel of the Switcher by following buttons:



«PiP1/OFF», «PiP2/OFF», switching on/off of the PiP1(2) mode on the source of background.

Switching off of the PIP1(2) mode on a source of background is made at in advance pressed and holding "SHIFT" button.



The buttons "WIN1/PRST1" - "WIN6/PRST6" (without "Shift"), can be done by switching on/off of the corresponding window in the current preset of PiP

The same buttons, but with previously pressed and holding "SHIFT" button, allow to select one of 6 preset of PiP.

Turning on special effects PiP1 и PiP2:

1. Set background source on the "Preview" screen. For this purpose on the line "Preview" press the appropriate source.
2. Press button "PiP1/OFF". - in the "Preview" window and in a small window of a source of background on Multiviewer the image of a combination of a background with preset PiP1 will appear



Изображение комбинации заднего плана с пресетом PiP в окне "Preview" и окошке источника заднего фона на Мультискрине

The same actions can be made also with "PiP2" on other source of a background.

Switching off of special effects of "PiP1" and "PiP2":

For switching off of special effect of PiP1 (or PiP2) to click "PiP1/OFF" (or "PiP2/OFF") with previously pressed and holding "SHIFT" button.

Preset PiP'S selection

1. Press and hold the SHIFT button - one of the buttons "WIN1/PRST1-WIN4/PRST6" which will show the current choice of the PiP preset will be lit.
2. To change preset PiP, it is necessary to press one of 6 buttons of "WIN/PRST". At the same time this button will light up in green color, the button of the previous PiP's preset will go out.
3. Release the "SHIFT" button.

Note: on the Control Panel only those buttons "WIN1/PRST1-WIN4/PRST6", which are used for this PiP preset (which was in advance created on the PC), will light in green color..

Setting and change of sources of images in PIP's preset windows

1. Press and hold the "WIN/PRST" button which corresponds to the window in which we want to change a source.
 - On the line "Preview", buttons of sources will be lit.
 - the blinking button - it is the current choice;
2. On the line "Preview" click the button with the necessary source.
 - the button of the selected source will begin to blink, the source in the window will switch to a new source.
3. Release the "WIN/PRST" button.

Note: If the window of the PiP preset is switched on in both special effects of PIP1 and PIP2, then at change of the source in it, the source will exchange in both special effects of PIP1 and PIP2.

Note (Important!) If to press and hold the "WIN1-WIN6" button, but after that not to press the button of a source in the line "Preview", then the video Switcher will apprehend this clicking as a command on turn on or off a window (i.e. if before clicking of the "WIN1-PIP6" button the window was active, then at release it to be switched off and vice versa).

The operational choice of the source of background for PIP special effect

1. Press and hold the "PIP1" button (or "PIP2" depending on, in what preset of PIP it is necessary to change a background);
 - On the line "Preview" buttons of sources will be lit.
 - The blinking button — the current choice;
2. On the line "Preview" to click the button with the necessary source.
 - the button of the selected source will begin to blink, the source in the window will switch to a new source.
3. Release the "PIP1"/"PIP2" button.

Order of creation of preset of PiP in the "RING 22 Switcher Control Panel" program

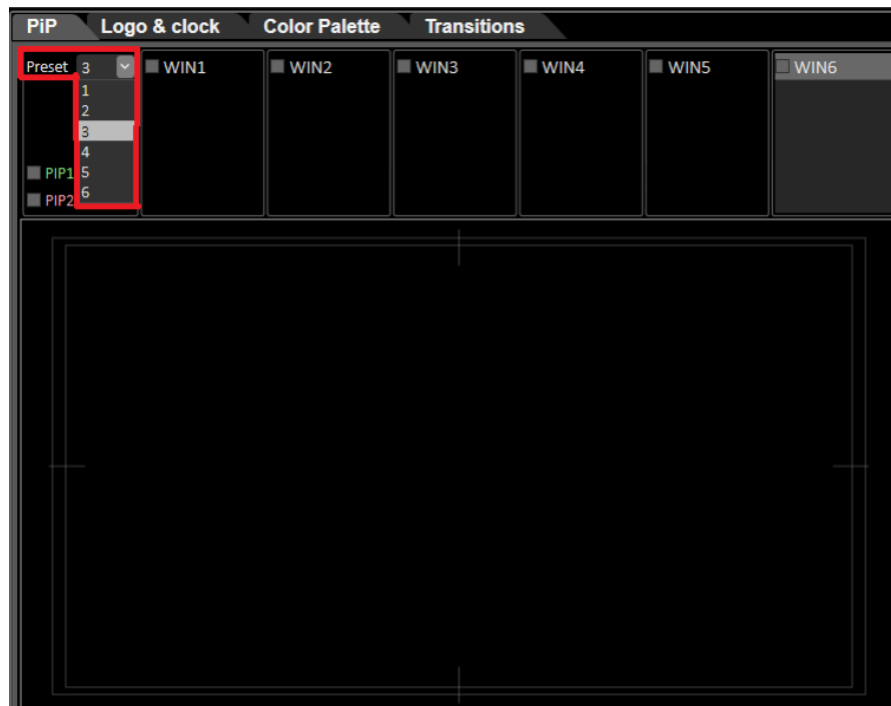


Bookmarks of setup of PiP's preset in the program "RING 22 Switcher Control Panel".

Order of creation of PiP's preset :

1. Start the program "RING 22 Switcher Control Panel" on PC ;
2. Open the "PiP" tab in the program "RING 22 Switcher Control Panel";
3. In the field of "Preset" select the number of the preset, which we want to make.

In our example it will be preset No. 3:



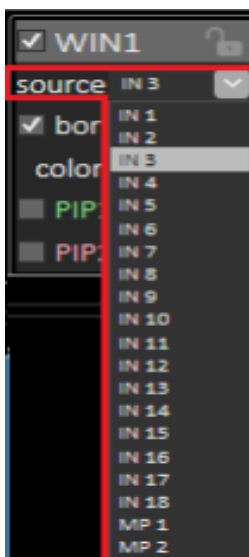
4. Select windows which will participate in a preset of PiP No. 3. In our example they will be 6.

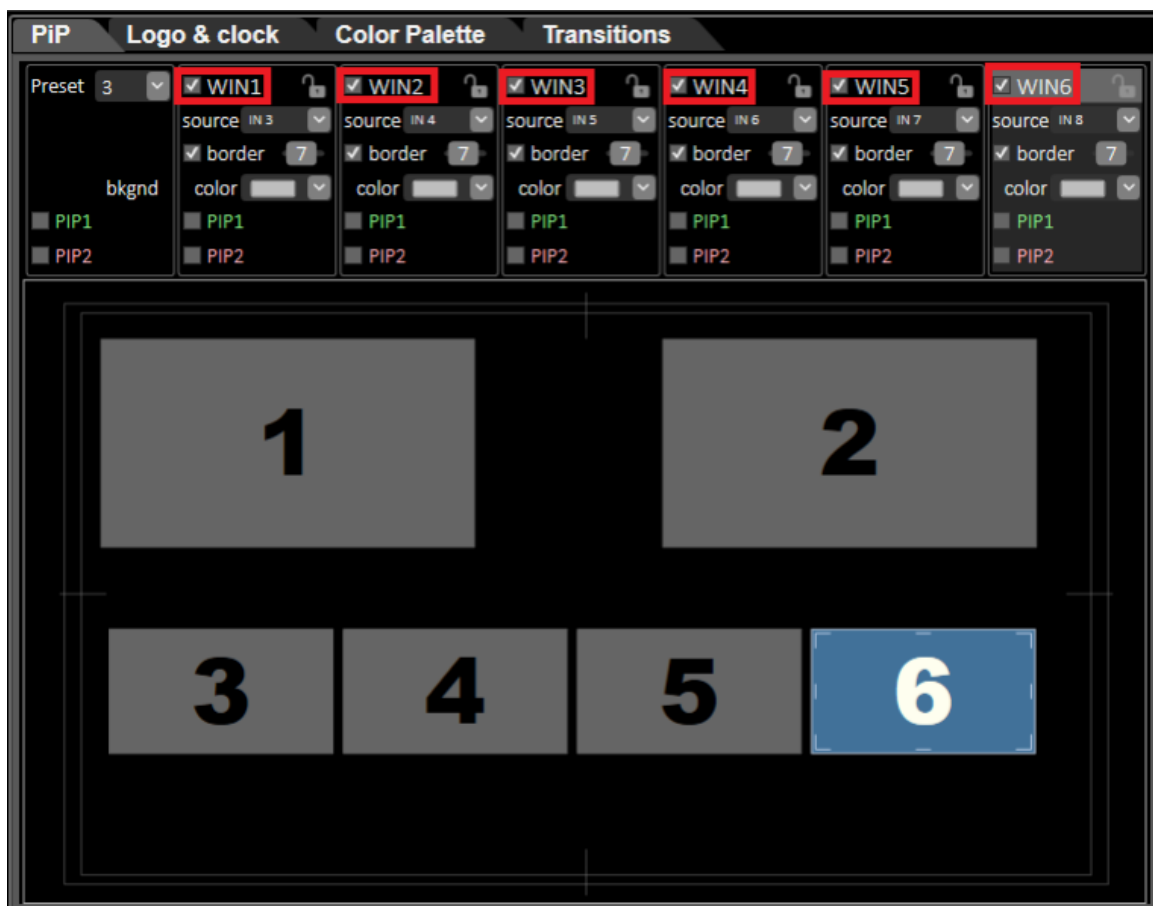
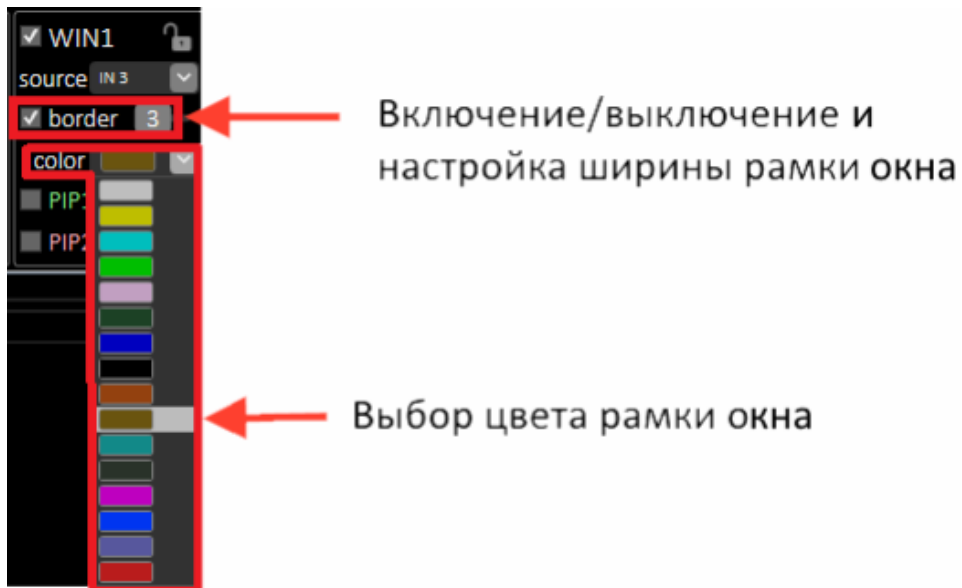
For this purpose we tick off in WIN1, WIN2, WIN3, WIN4, WIN5 and WIN6.

At the same time in WIN1, WIN2, WIN3, WIN4, WIN5 and WIN6 menu settings of sources of windows, switching on/off of a framework of windows, the choice of color of a framework of windows will appear and in what variant of special effect of PiP1 and PiP2, the window will be switched on.

Also all 6 windows in a window of setup of the PiP preset will appear.

Choice of a source in the window:





5. We select windows which will be switched on in PIP1's special effect mode, for this purpose we tick on in the PIP1's fields in those windows (WIN1-WIN6), which we want to switch on.

In our example - it will be WIN1,WIN2,WIN3 and WIN4 windows:

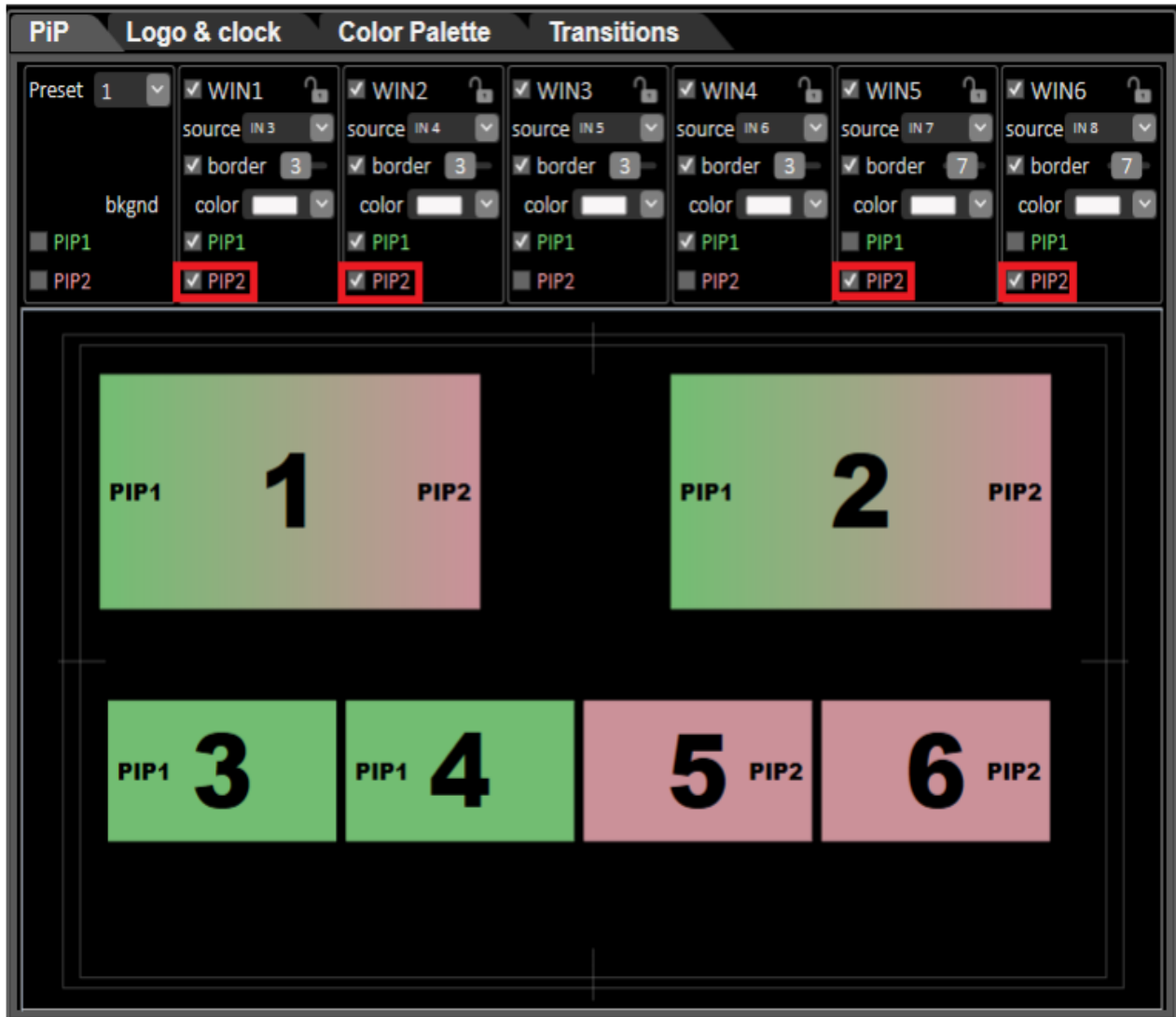


At the same time the activated windows will be displayed in green color in the "Preview" of the PIP's tab in the "RING-22 Switcher Control Panel" program.

2. We select windows which will be included in "PIP2" special effect mode.

For this purpose we tick on in the "PIP1" fields in those WIN1-WIN6 windows which we want to include.

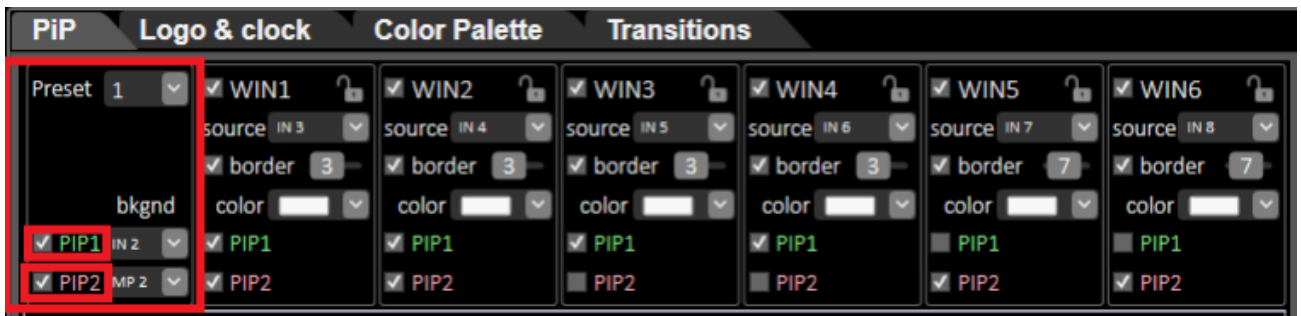
In our example - it will be WIN1, WIN2, WIN5 and WIN6 windows:



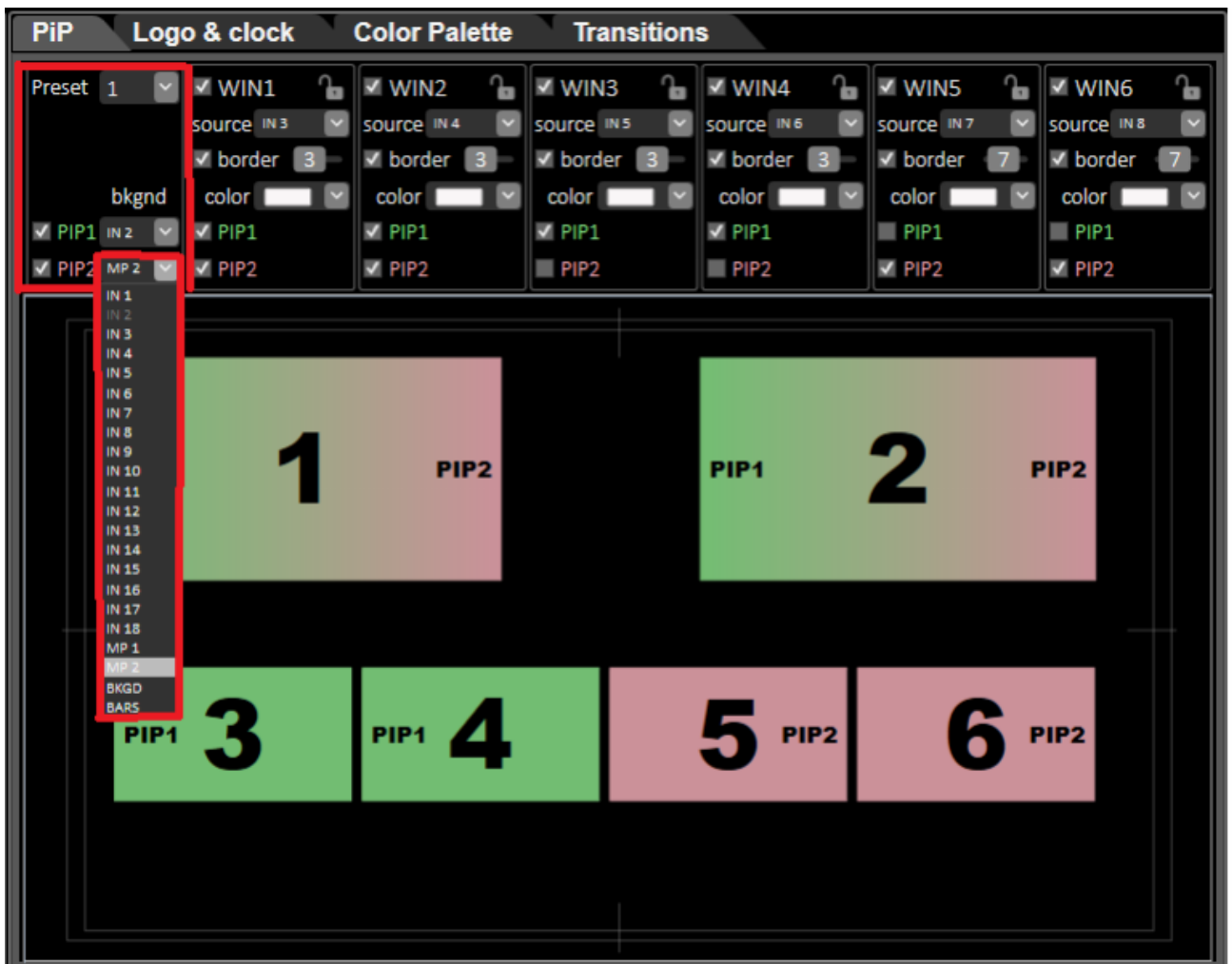
At the same time the activated windows will be displayed in pink color in the "Preview" of the PIP's tab in the "RING-22 Switcher Control Panel" program.

Note: Windows which take part in both modes of special effects of PIP1 and PIP2 will be displayed in 2 colors – one half in green color, and the second half pink.

It is possible to switch on the modes of special effects of "PIP1" and "PIP2" also in the PIP's bookmark in the "RING-22 Switcher Control Panel" program, by using ticks on. I.e. switching on/off of these ticks corresponds to switching on/off of the PIP buttons on hardware and program Control Panel of video Switcher.



In the PIP's bookmark in the "RING-22 Switcher Control Panel" program, it is possible to change a background (Background) for the modes of special effects of PIP1 and PIP2.



18. Reassignment of buttons of the Control Panel (Source Mapping)

The "Source Mapping" function allows the user to assign inputs and internal sources of video Switcher to buttons, suitable for its work.

Setup of the "Source Mapping" function is carried out by using of the program "Ring22 Switcher Control Panel" which can be downloaded at the following link:

https://dv-lab.com/product_dv/RING_22_SwitcherControl_install_190221.zip

For this purpose after installation and start of the "Ring22 Switcher Control Panel" program, it is necessary to open the bookmark "Source Mapping".

From the beginning at factory defaults, number of the button of the Control Panel correspond to the number of video input: button No.1– In1, button No.2– In2, button No.3– In3,.. button No. 2– In22.

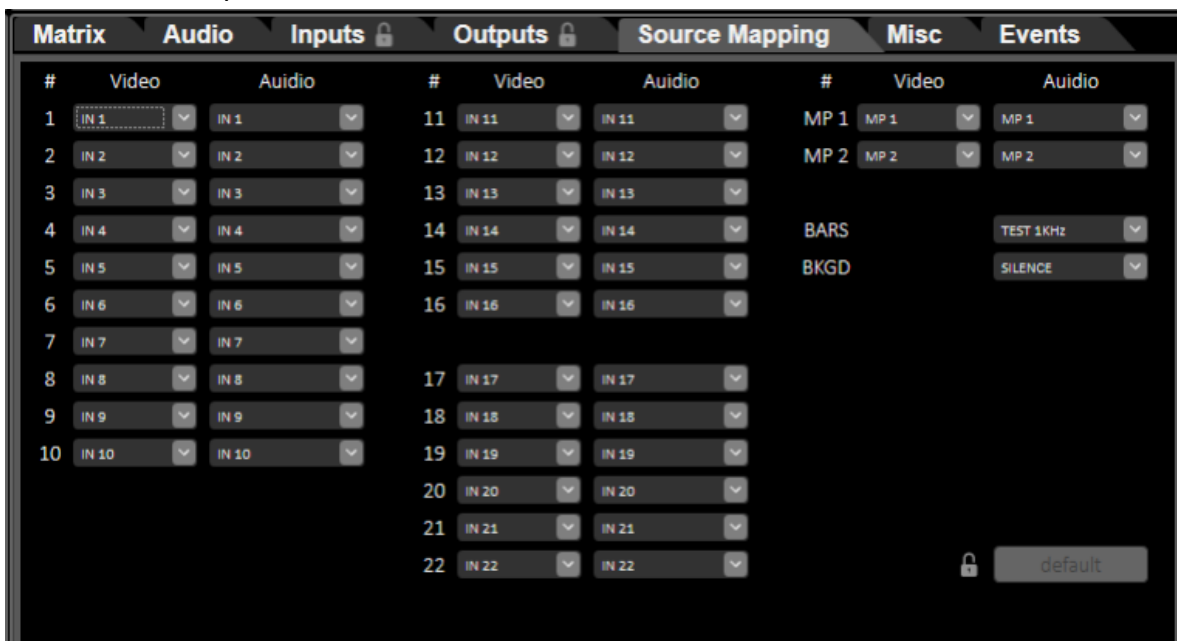


Fig. The "Source Mapping" bookmarks in the "Ring22 Switcher Control Panel" program, Configuration of video inputs and internal sources of the Switcher, assigned to the Control Panel buttons by default.

In the drawing the character "#" indicate the number of buttons and the name of internal sources of video Switcher on the Control Panel:

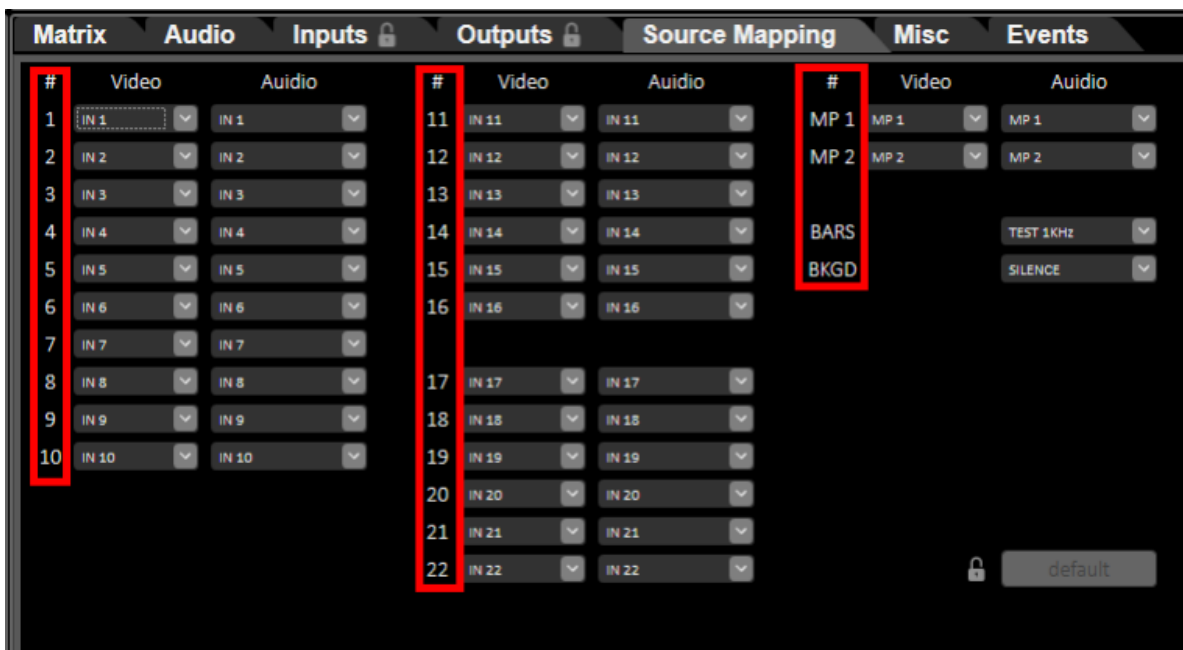


Fig. Columns "Button Number".

In the column "**Video**" it is possible to select an input or an internal source which it is necessary assign to the button:

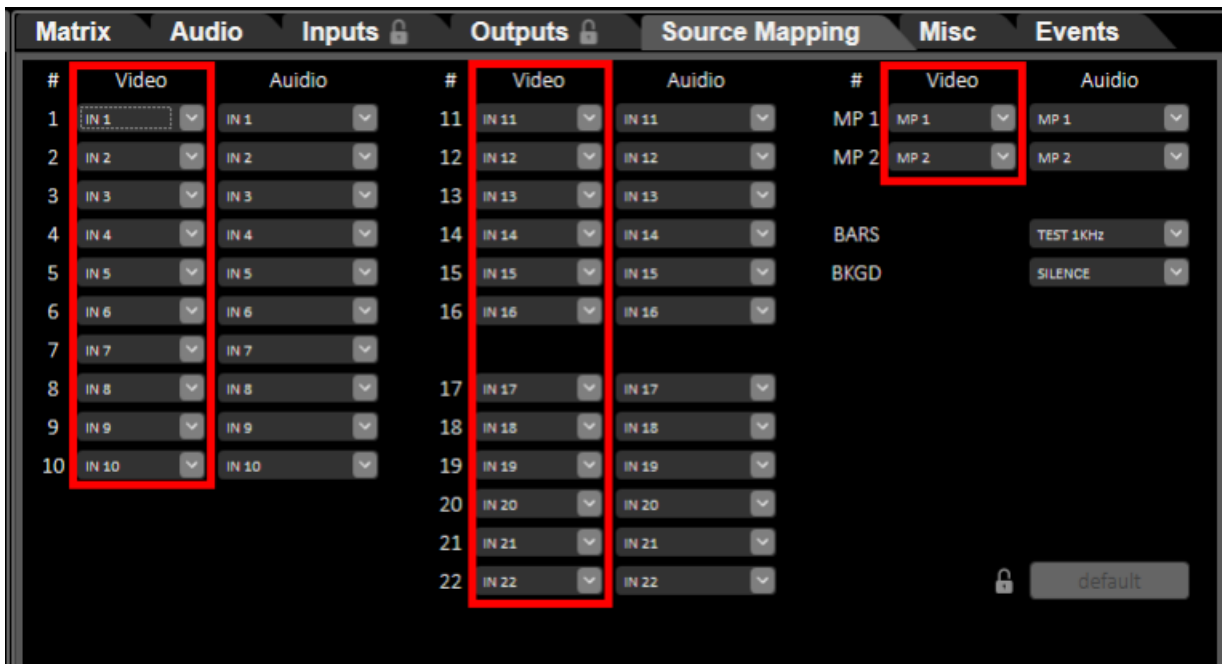


Fig. Columns «Video».

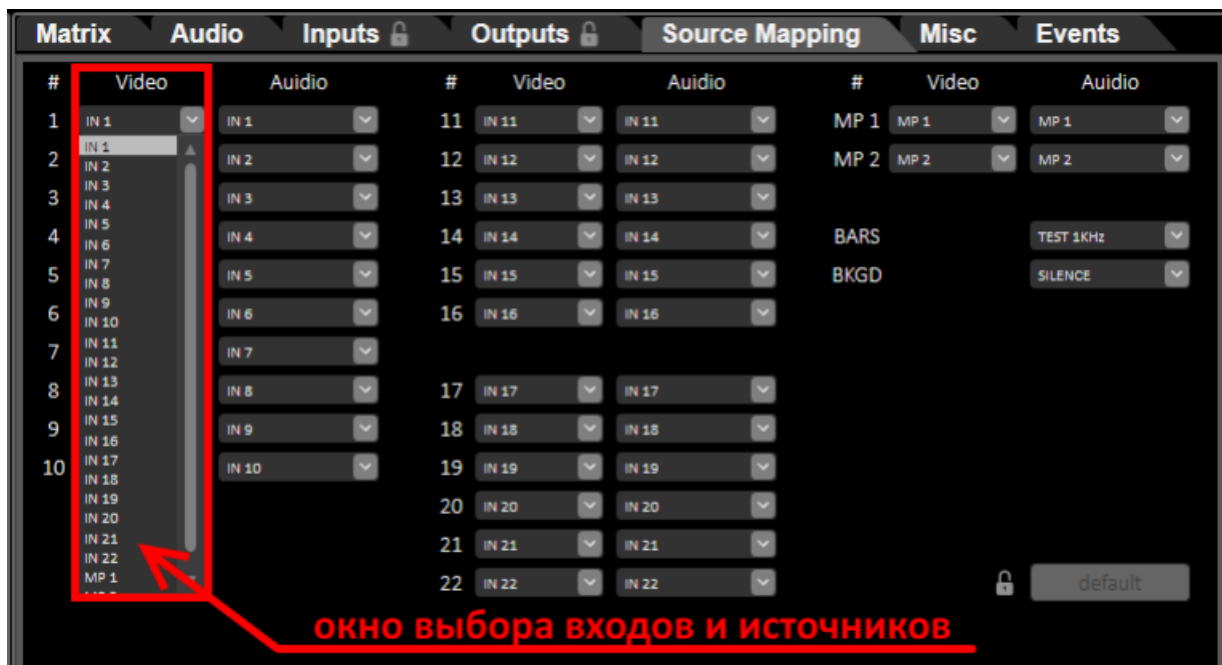


Fig. Window of the choice of inputs and sources of video.

In the column “**Audio**” it is possible to select a source of the sound which it is necessary to assign to the button.

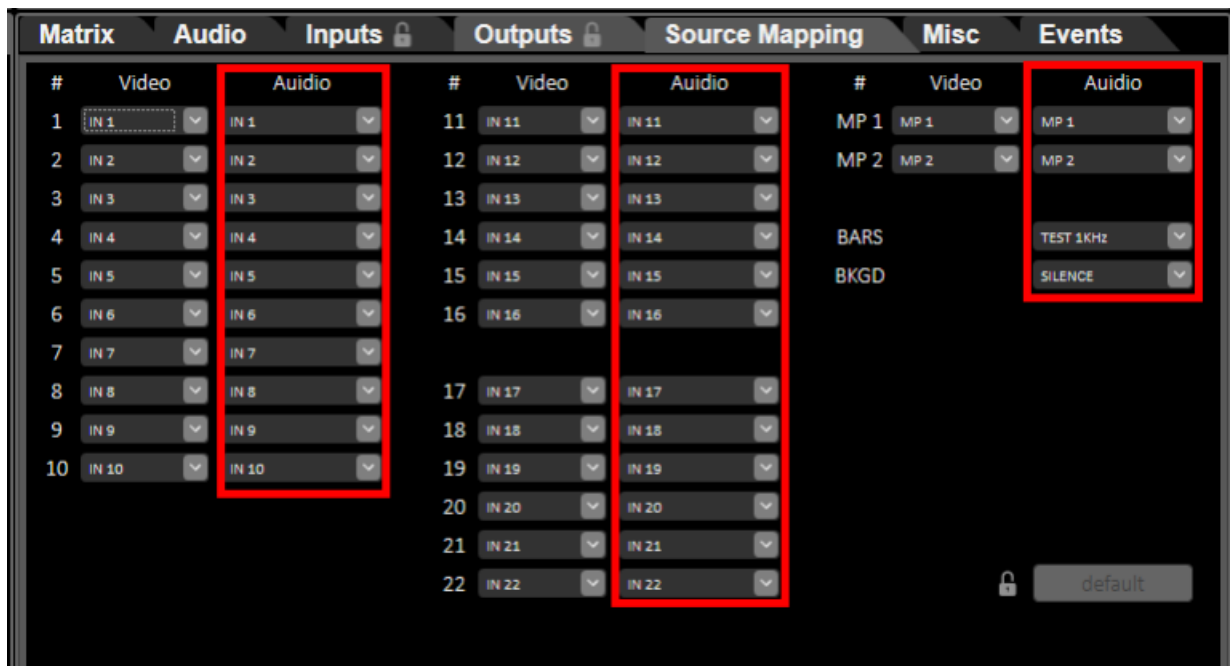


Fig. Columns «Audio».

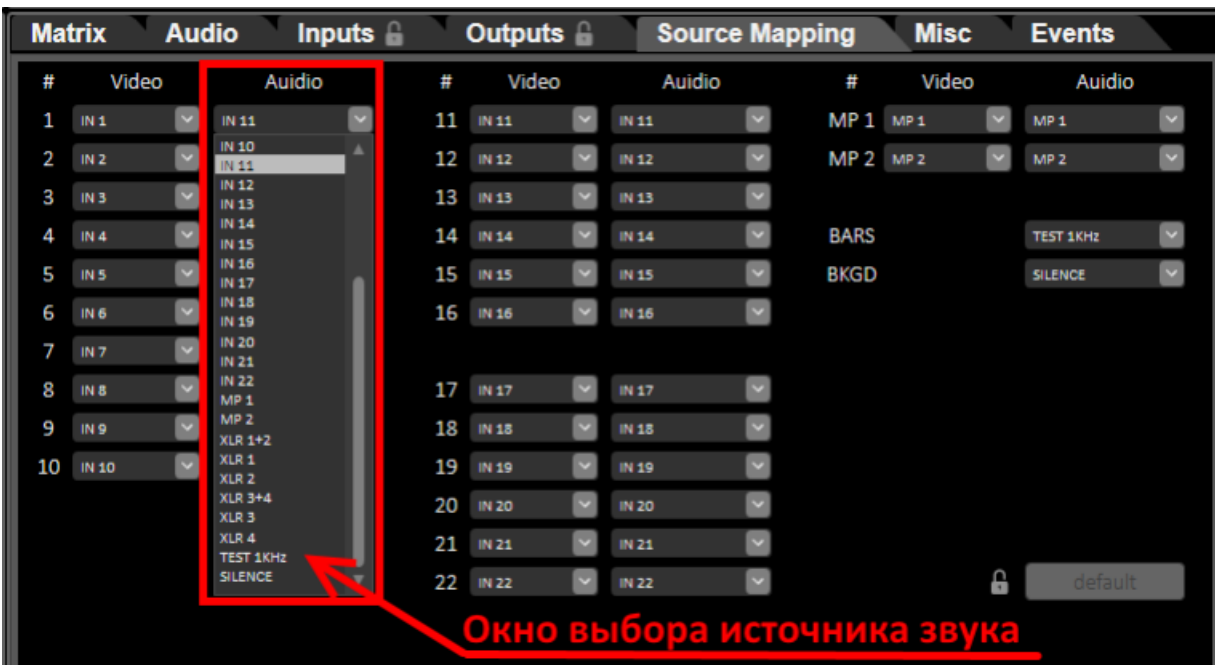
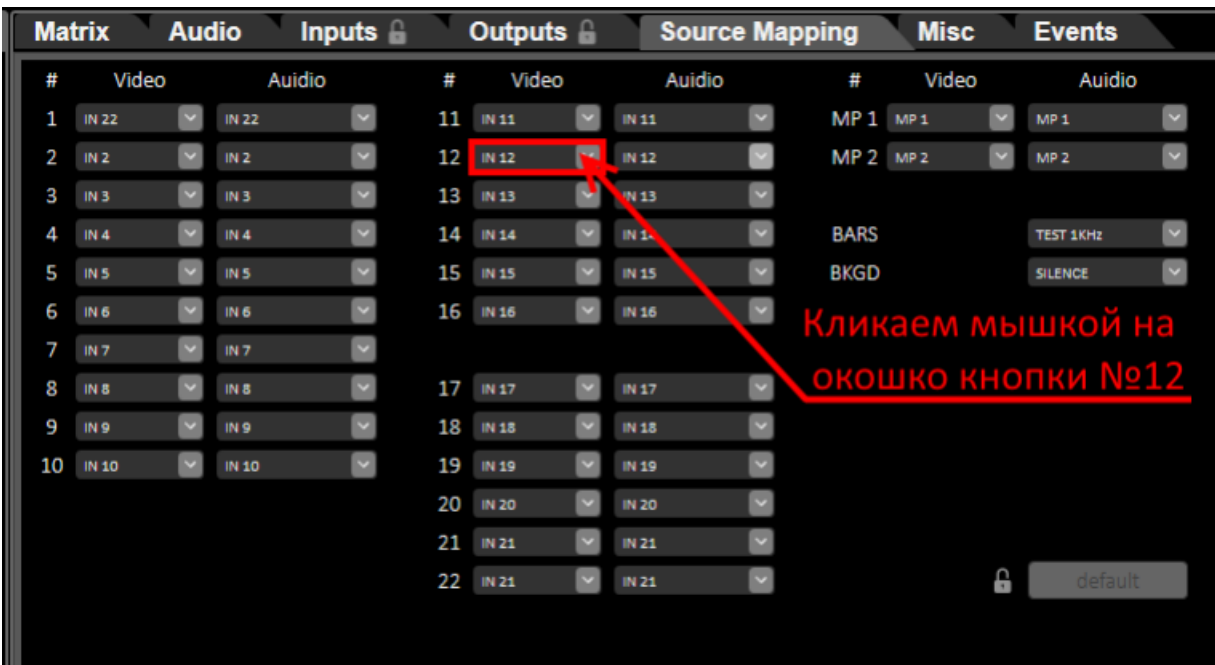


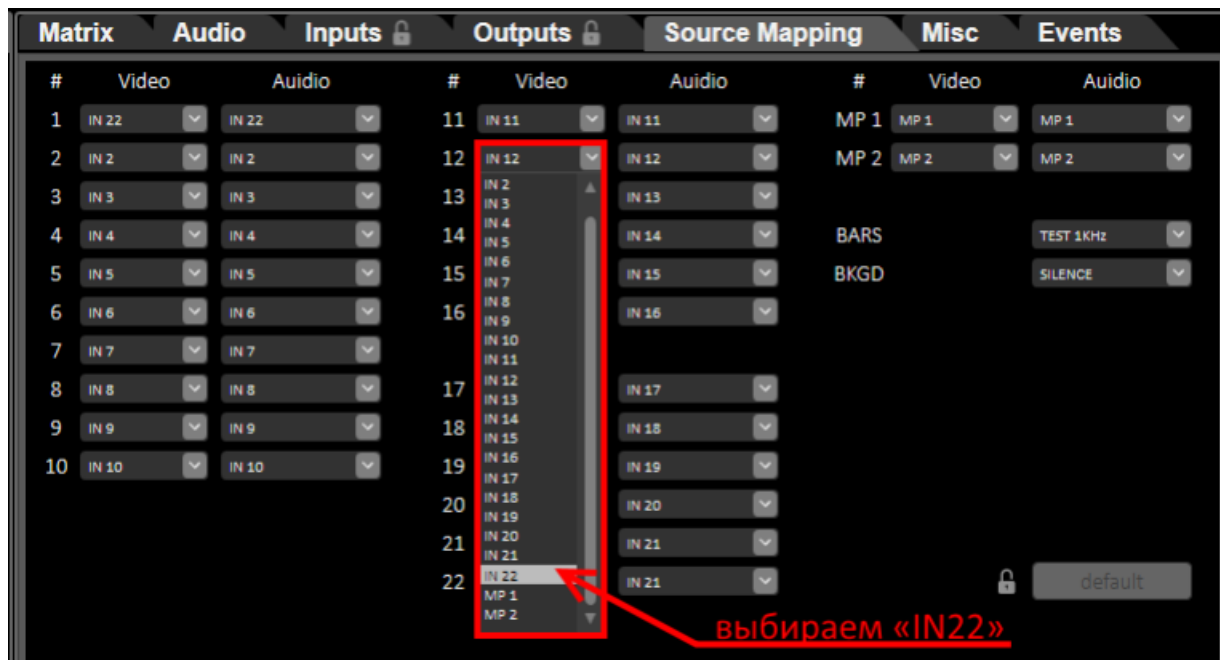
Fig. Window of the choice of sources of a sound.

For example it is necessary to assign to button No. 12 of the Control Panel the video signal from the 22nd input, and audio source assign from analog inputs of XLR1 + XLR2:

1. Start the program «Ring22 Switcher Control Panel»;
2. Open bookmark «Source Mapping»;
3. We click with a mouse on the button No.12 in the window in the column "Video", see fig.:

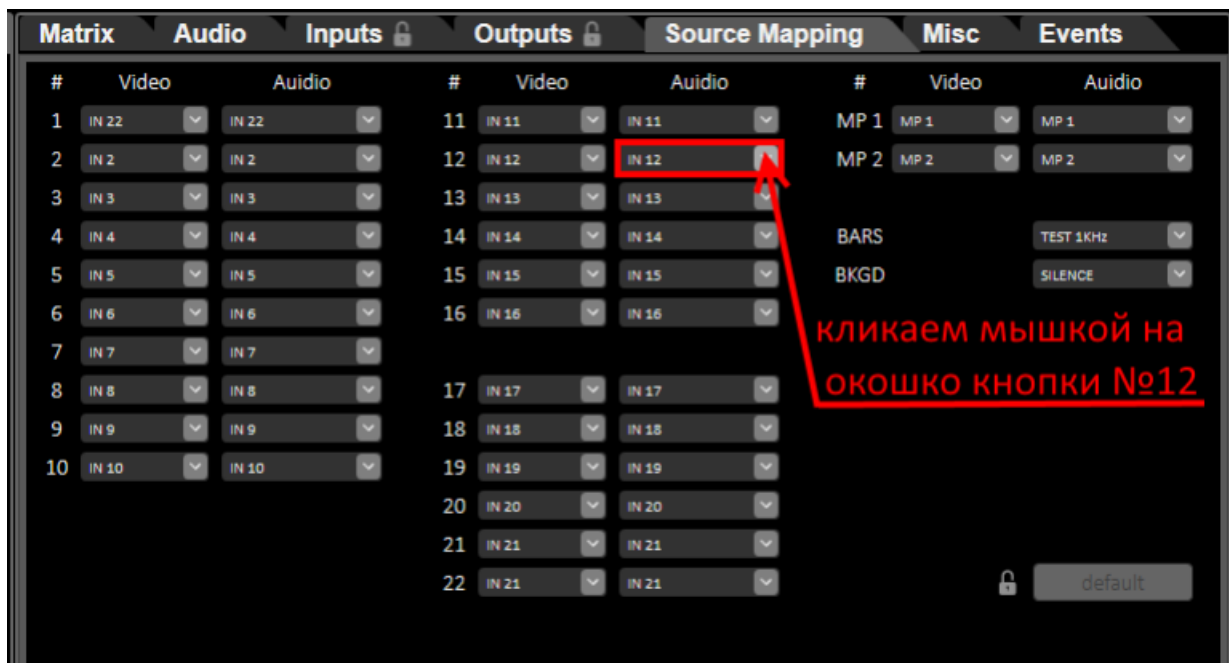


4. In the dropdown menu we select "IN22", see fig.:

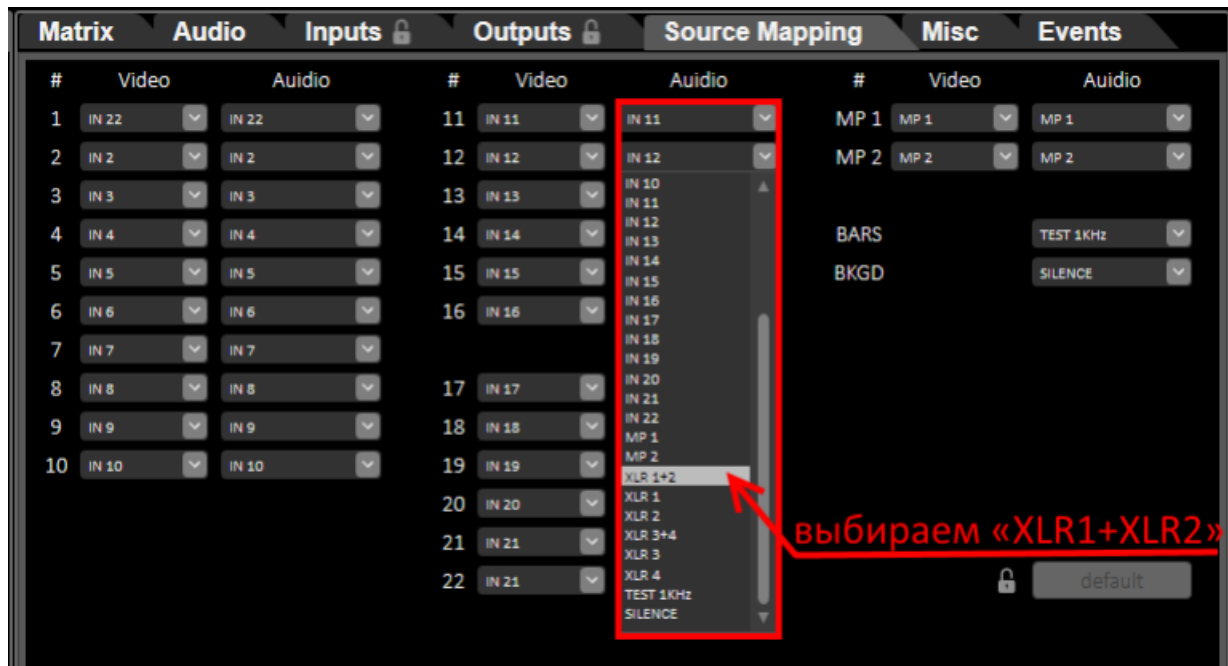



5. In window No.1 of "Multiviewer" video signal from IN22 input will appear;

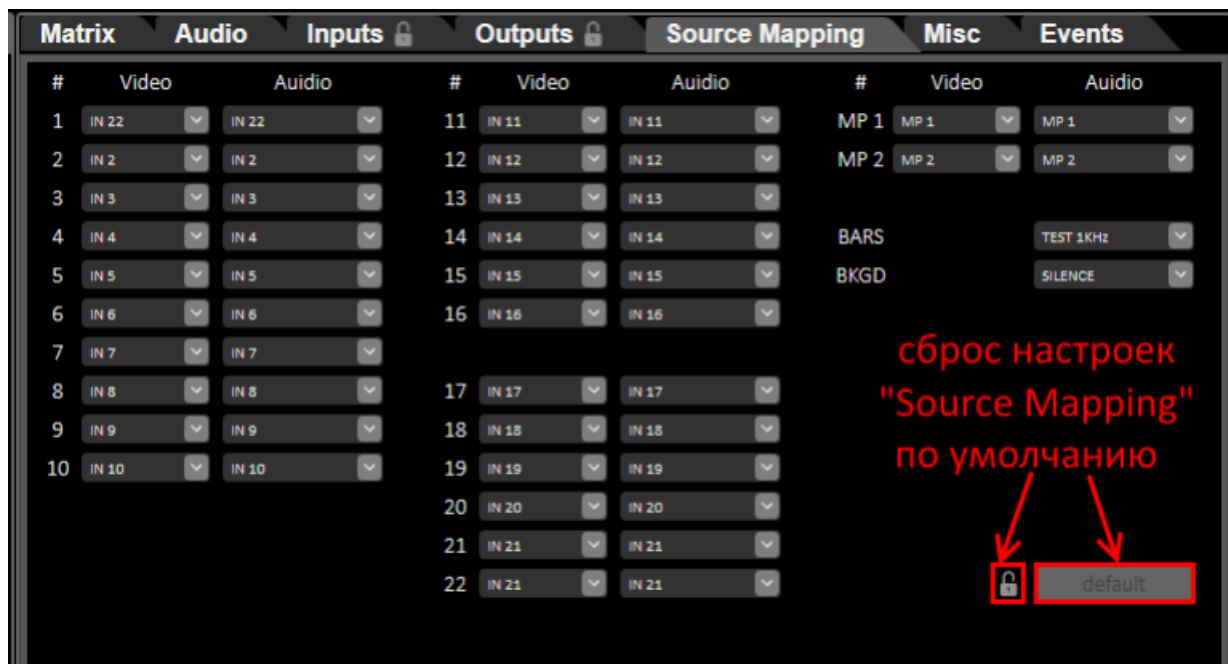
6. Then we click with a mouse on the window to the button No.12 in the column "Audio", see fig.:



7. In the dropdown menu we select "XLR1 XLR2", see fig.:



Note: For return to the settings of video and audio on panel buttons to default it is necessary to click at first , and then to click "default", see fig.:



19. Creation and record of the animated transitions

Creation of video clips of the animated transitions.

For creation of the video clip for the animated transitions it is possible to use practically any popular video editor.

During creation of video clips there are no special restrictions, except such as:

1. The background of the video clip shall be completely green or blue color;
2. If the user selected green color for a background of the video clip, then in the picture of the animated video of transition it is impossible to use green color.
- If the user selected blue color for a background of the video clip, then in the picture of the animated video of transition it is impossible to use blue color;
3. For the correct working off of the animated video of transition the first frame of the video clip shall be completely green or blue color;
4. Duration of the animated video of transition should not exceed 1 minutes;
5. Video format of the video clip should be-1920x1080 (i or p);
6. For saving of the video clip it is possible to use practically any of popular videos codecs – mp4, mov, avi, etc.

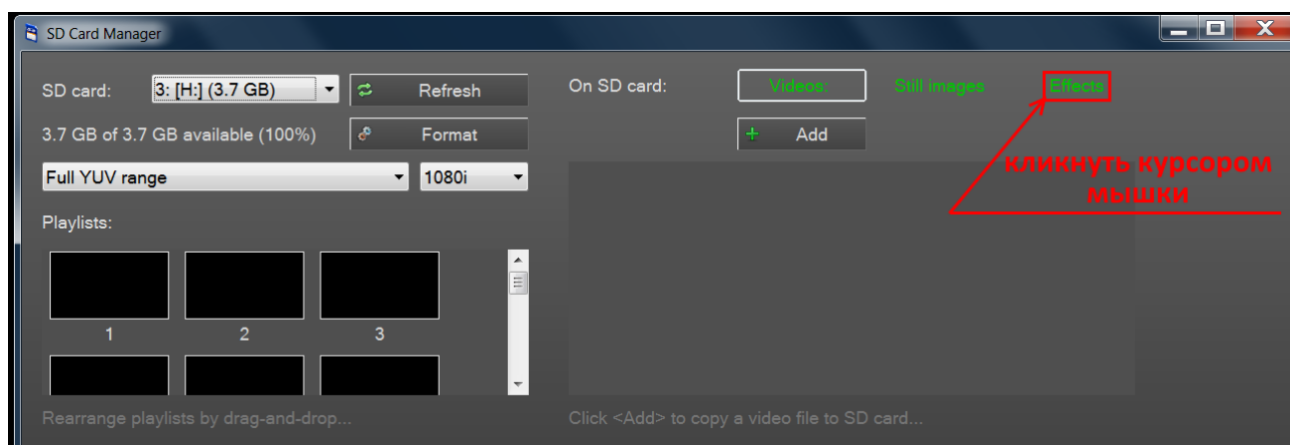
Record of the animated transitions.

For video playback of clips of the animated transitions on the video Switcher it is used Player on a SD card.

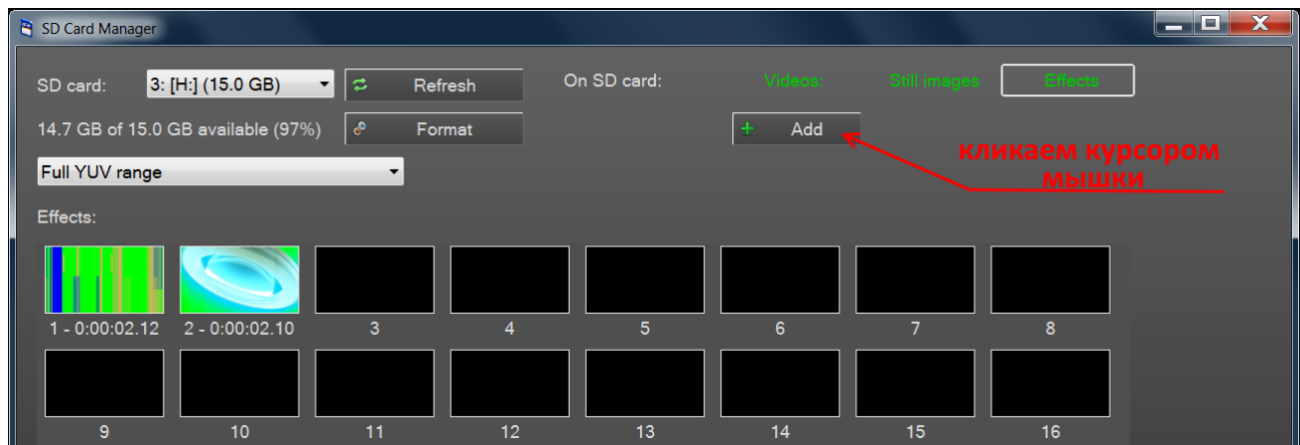
For record of the video clips of the animated transitions to the SD card, can be used program "SD Card Manager" which is delivered together with a video Switcher and, also, it can be downloaded from the website of the producer on the following link:

https://dv-lab.com/files/files3/SDCardManagerHD_Install_151109.zip

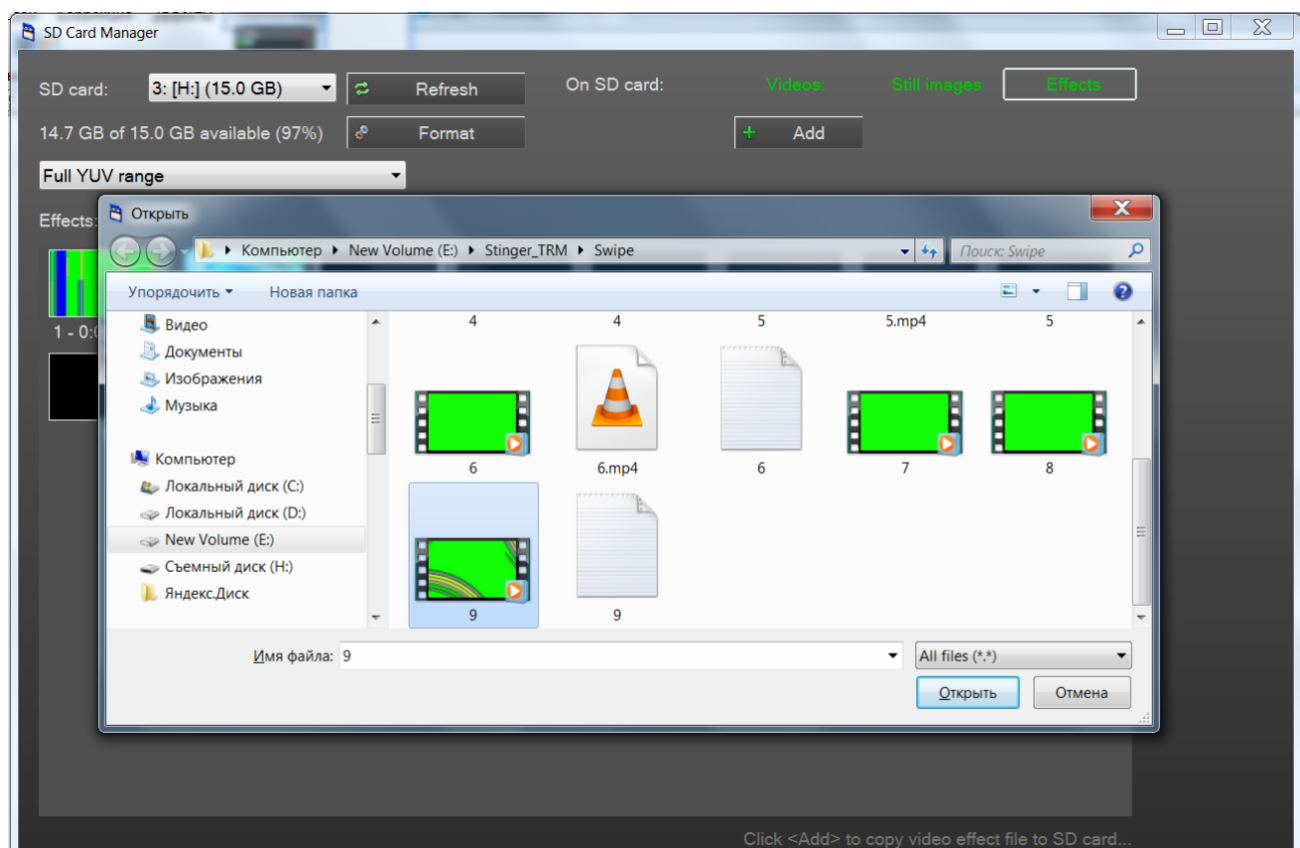
1. Start the SD Card Manager program on the PC;
2. Click with cursor of the mouse on a text of **"Effects"**, see fig.:



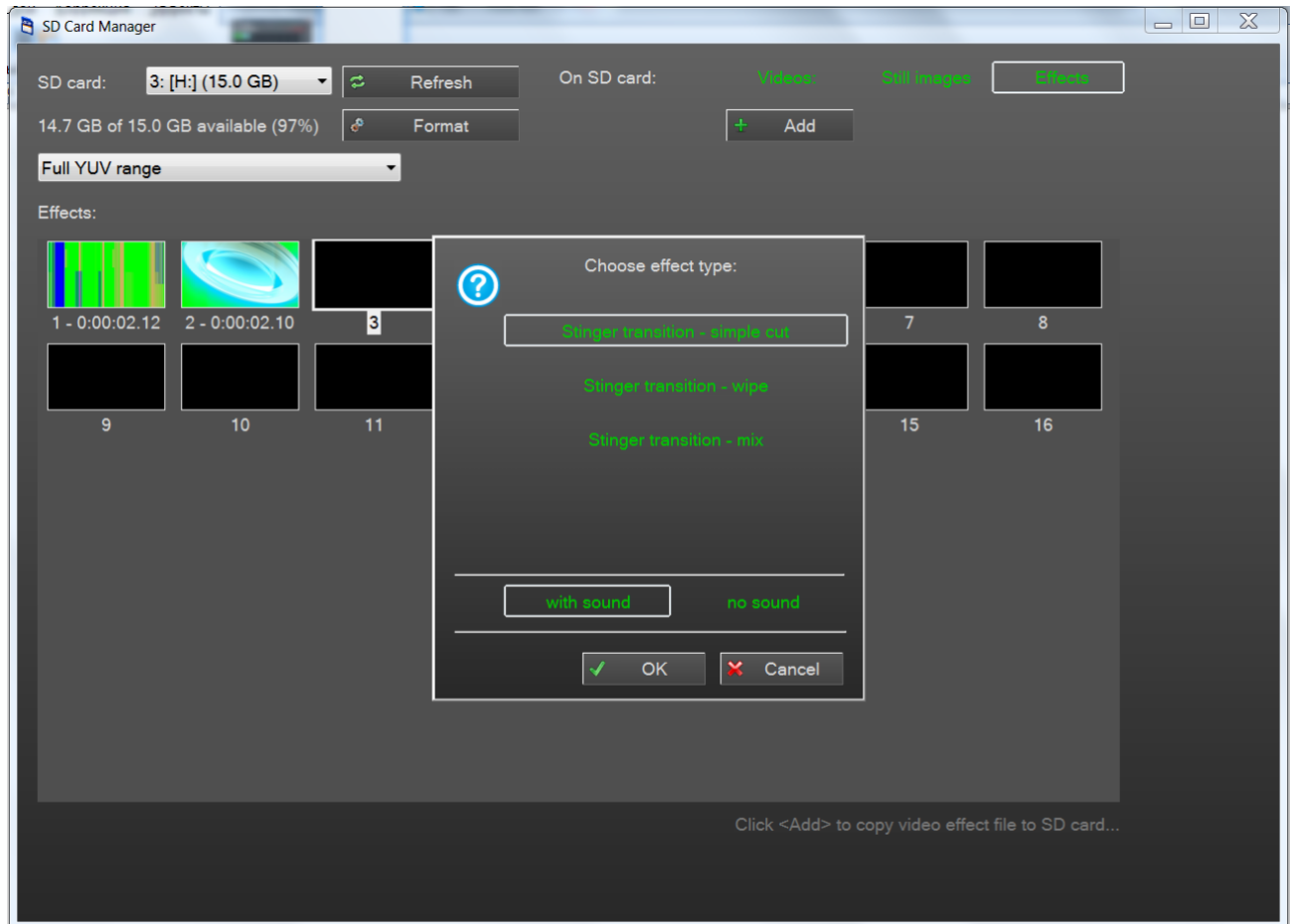
3. Click with the cursor of the mouse on a text of **"Add"**, see fig.:



4. We select the video clip which is in advance prepared for the animated transition, see fig.:



5. Further select the type of the animated transition, see fig.:



Stinger transition – «simple cut» : upon this animated transition, switching from a source in "Program" to a source in "Preview" happens in the key point exposed by the user in the video clip, as when clicking the "CUT" button.

In more detail, see in point No. 5;

Stinger transition – «wipe» : upon this animated transition, switching from a source in "Program" to a source in "Preview" happens with effect of "Wipe" (replacement).

In more detail, see in point No. 6;

Stinger transition – «mix»: upon this animated transition, switching from a source in "Program" to a source in "Preview" happens with effect "MIX" (mixing).

In more detail, see in point No. 5;

Also animated transitions can be with a soundtrack or without soundtrack.

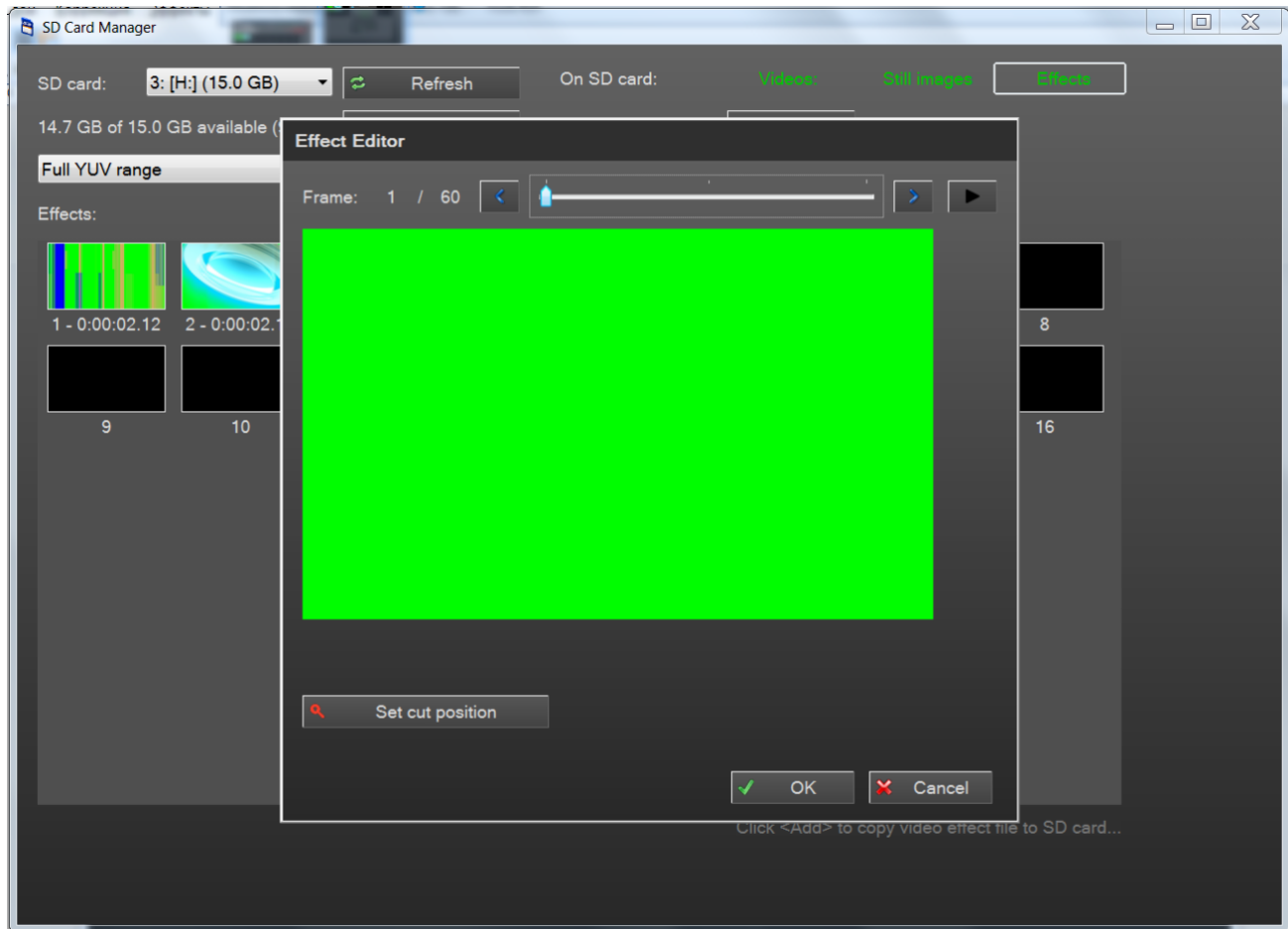
For the animated transition with a soundtrack, we click.

with sound

For the animated transition without soundtrack, we click.

no sound

6. Setting “Stinger” transition – «simple cut» and “Stinger” transition – «mix»:



Frame: 1 / 60 - number of the current frame of the video clip / total quantity of frames of the video clip;



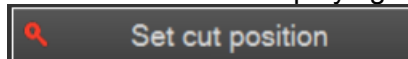
- button of switching to the following frame of the video clip;



- button of switching to the previous frame of the video clip;

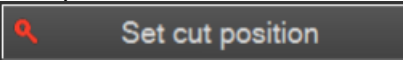


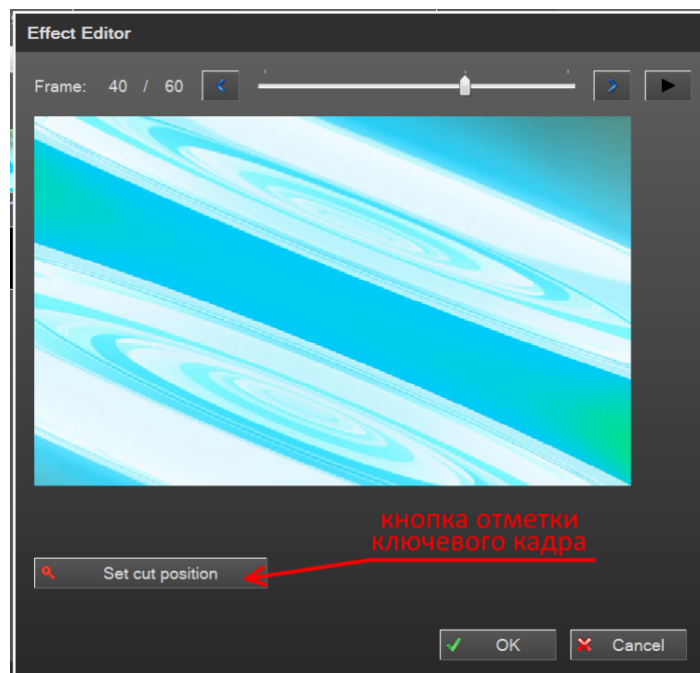
- the button of playing of the video clip in the editor of the animated transitions;




- the button of a mark of a key frame at which there will be an immediate switching from a source in "Program" to a source in "Preview".

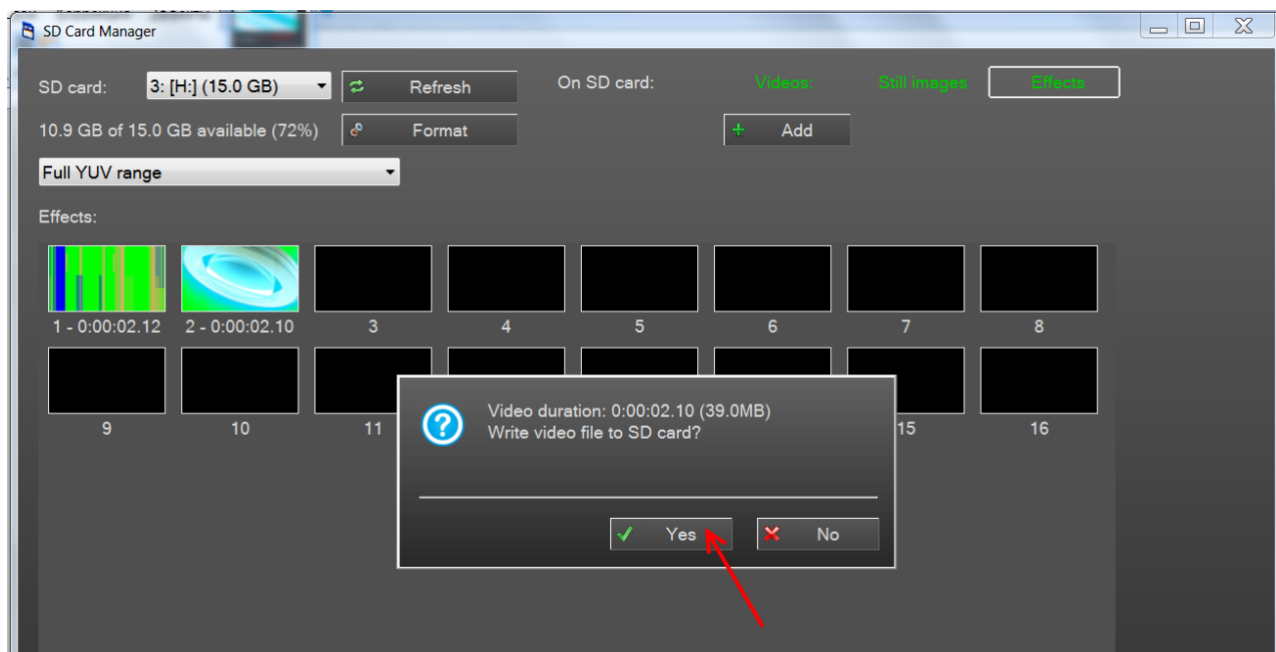
Stinger transition – «simple cut», usually applying, when in the video clip there is a frame in which the picture completely blocks the screen and in this frame the switch point from a source in “Program” on a source in “Preview” is setting.

In our example it is frame No. 40, and on this frame it is necessary to click button , see pic.



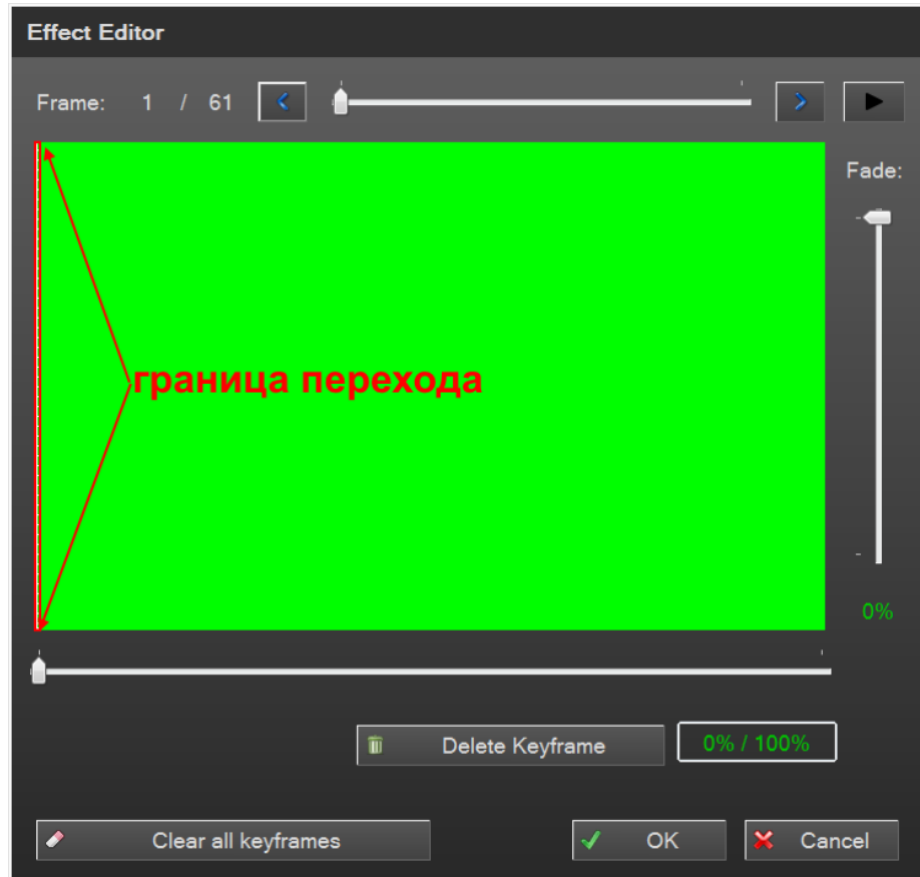
After the key frame of switching is selected, we click. 

For record of the animated transition to the SD card, in the opened window we click the button , see fig.:



Stinger transition – «mix», apply when the user wants to use switching from a source in "Program" to a source in "Preview" with effect "MIX" (mixing), but with adding of animation on the screen. The "Stinger" transition - "mix" setup, happens by the same principle, as "Stinger" transition - "simple cut", but the user selects the place of a key frame itself, depending on video of the clip.

6. Setup **Stinger transition – «wipe»**:



Frame: 1 / 60 - number of the current frame of the video clip / total quantity of frames on the video clip;



- button of switching to the following frame of the video clip;



- button of switching to the previous frame of the video clip;



- the button of playing of the video clip in the editor of the animated transitions;



Add Keyframe -add key frame;



Clear all keyframes -delete all key frames;



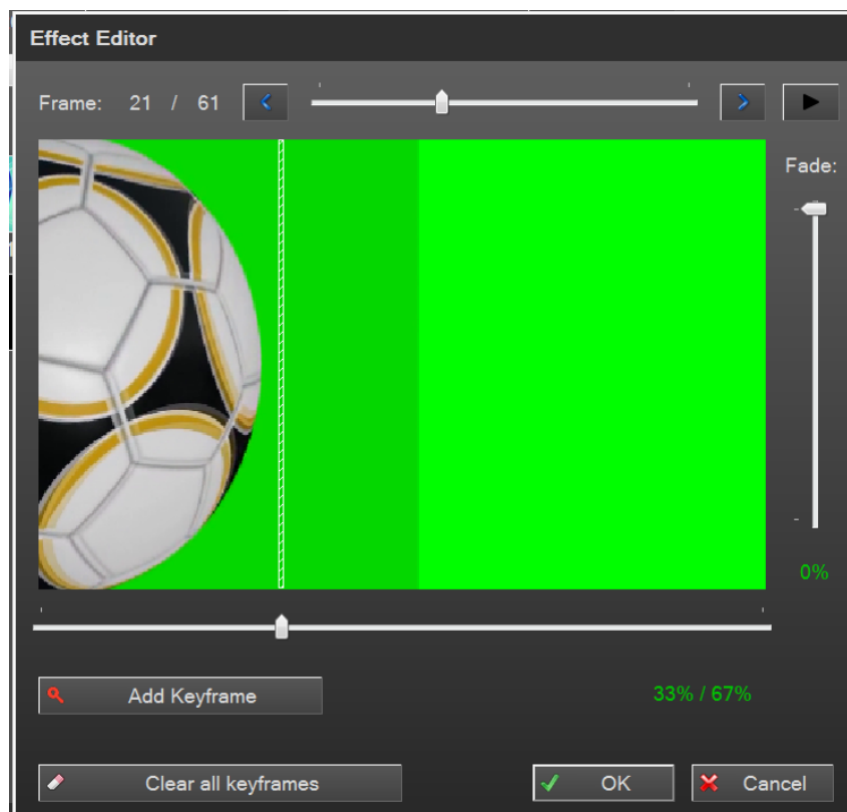
Fade: - installation of damping degree of the picture.

Stinger transition – «wipe», usually apply when in the video clip the picture moves from the left side of the screen to the right side. In this case from the source in “Program” to the source in “Preview” it is reasonable to make switching by using of effect of replacement (WIPE).

For example, we have the video clip with the football ball which is flying from the left to the right. We see transition border in the extreme left side of the screen in the first shot of the video clip.

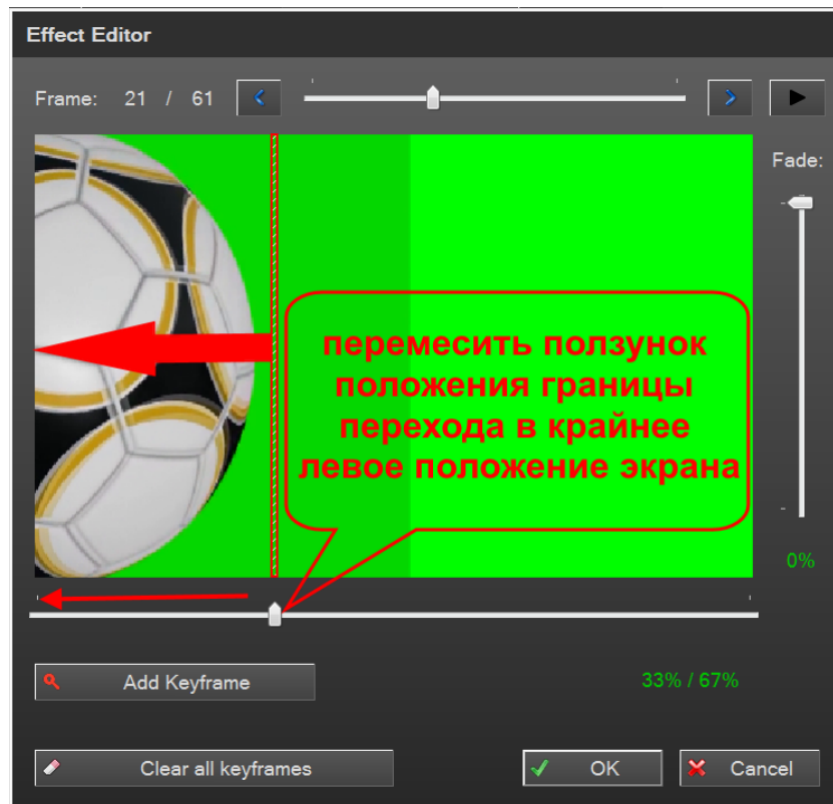
In order that transition of "Stinger" transition - "wipe" on the screen was correctly displayed, the first that needs to be made is to combine transition border between sources and a frame in which the picture completely blocks the screen in vertical direction.

In our case we select by means of buttons  and  frame No. 21 when in in extreme the left part of the screen the frame with a half of a soccerball, see fig. appears:

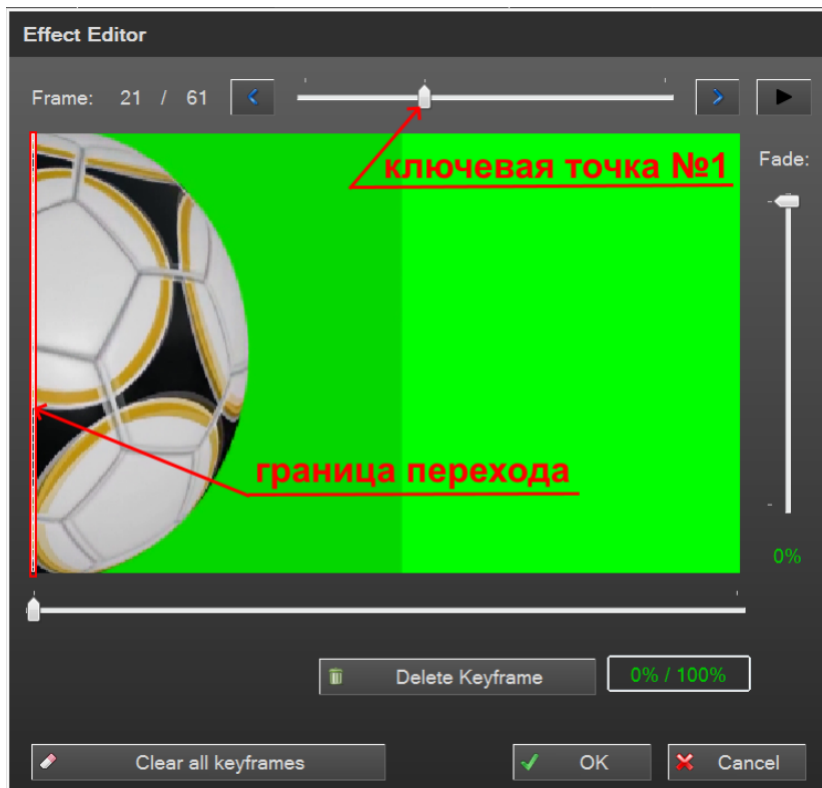


On the picture it is visible that the border of transition and the positions of the picture (when it completely blocks the screen in vertical direction) does not match.



In order that to combine them, it is necessary to move the slider of position of the border of transition, by using the mouse, to the extreme left position of the screen, see fig.:

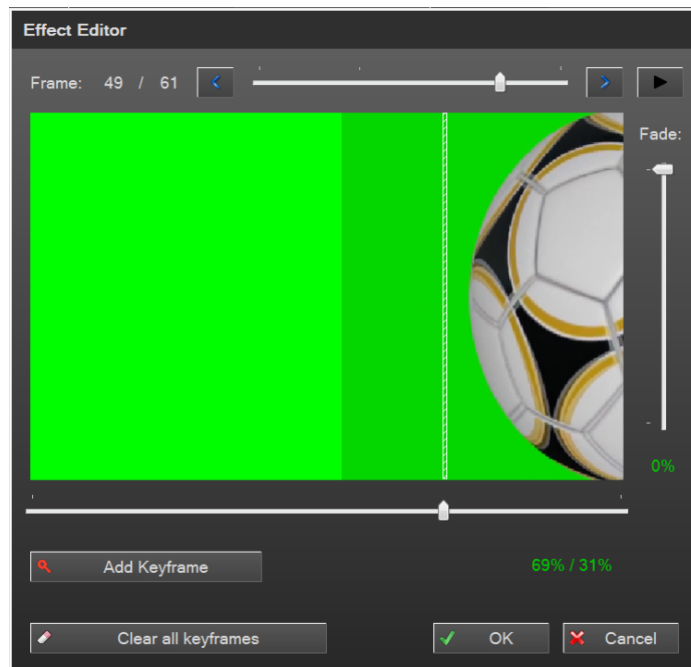


After we moved border of transition to extreme left position of the screen, the program automatically sets a key point on the frame No. 21, see fig.:

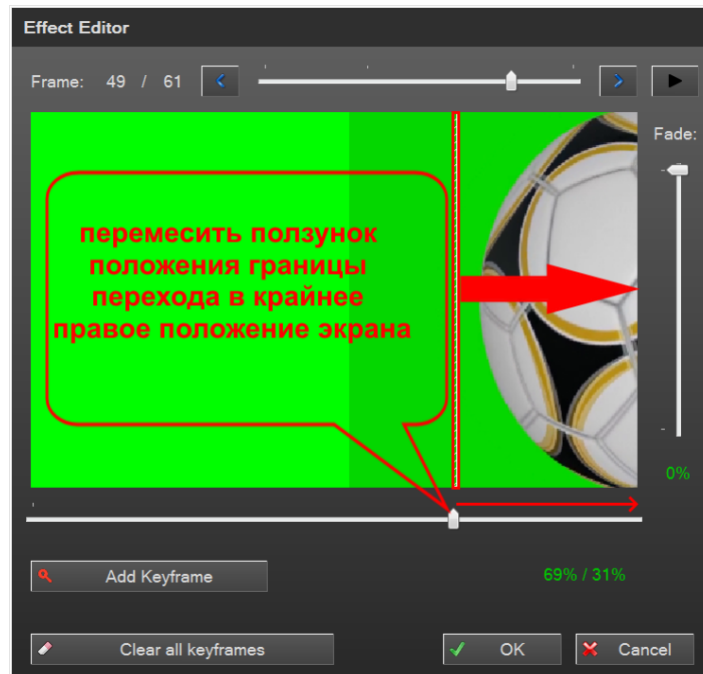


Further it is necessary to set key point No. 2 at the end of the video clip.

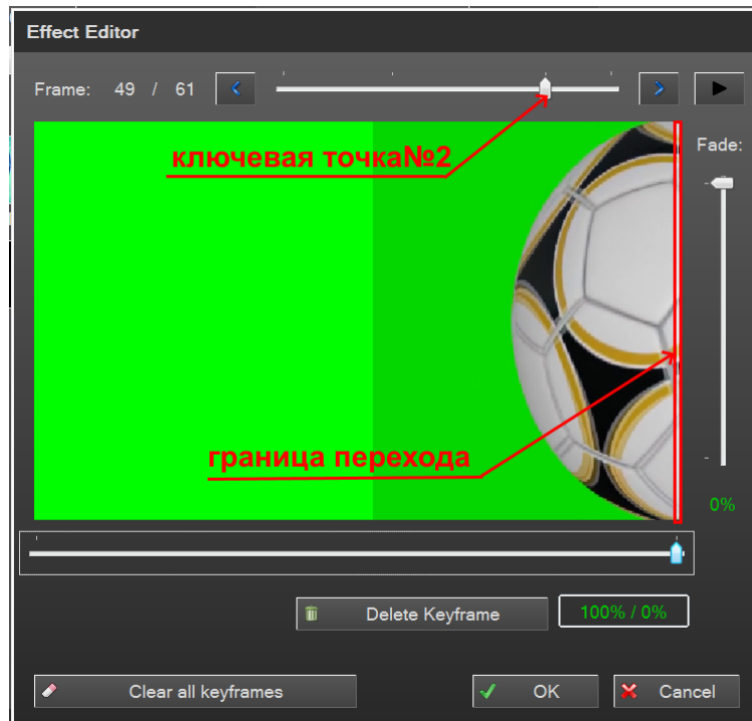
In our case we select by using buttons  and  frame No. 49, when in extreme the right part of the screen the frame with a half of a soccerball, see fig. appears:



On the picture it is visible that the border of transition and the position of the picture (when it is completely blocks the screen in vertical direction) does not match. For combining them, it is necessary to move the slider of the position of border of transition, by using the mouse, to extreme right position of the screen, see pic.:



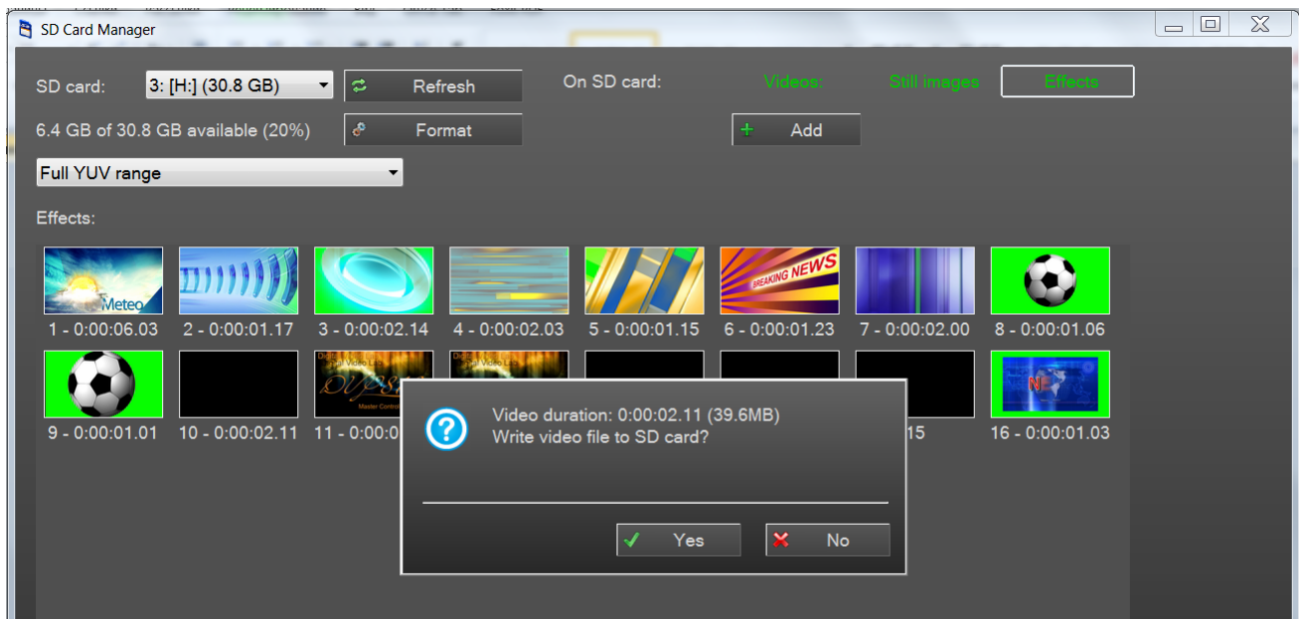
After we moved border of transition to extreme right position of the screen, the program automatically sets the key point on the frame No. 49, see fig.:



If necessary, it is possible to add still key points for any frame,

After all key frames are selected, we click ☒ OK.

For record of the animated transition to the SD card, in the opened window we click the button ☒ Yes, see fig.:



Operational management of the system of replay -" Replay System".

The option -" Replay System" for RING-22 Switcher is the system for single-channel record and reproduction of replays On the Open Air of telecasts.

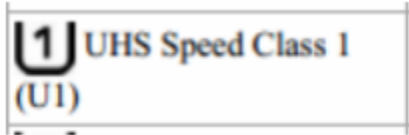
Record of a **signal "Program"** and reproduction of replays to be made on the SD card.

Attention!!!

For record it is possible to use SD cards only of UHS (Ultra High Speed) — high-speed data exchange protocol.

Other cards will not work!

For cards of the UHS standard the high-speed class is marked by the number in letter U.



For example:



Record on the card is made with a speed of 120 Mbit/sec.

It is possible to use cards 16,32,64,128, 256 GB capacity

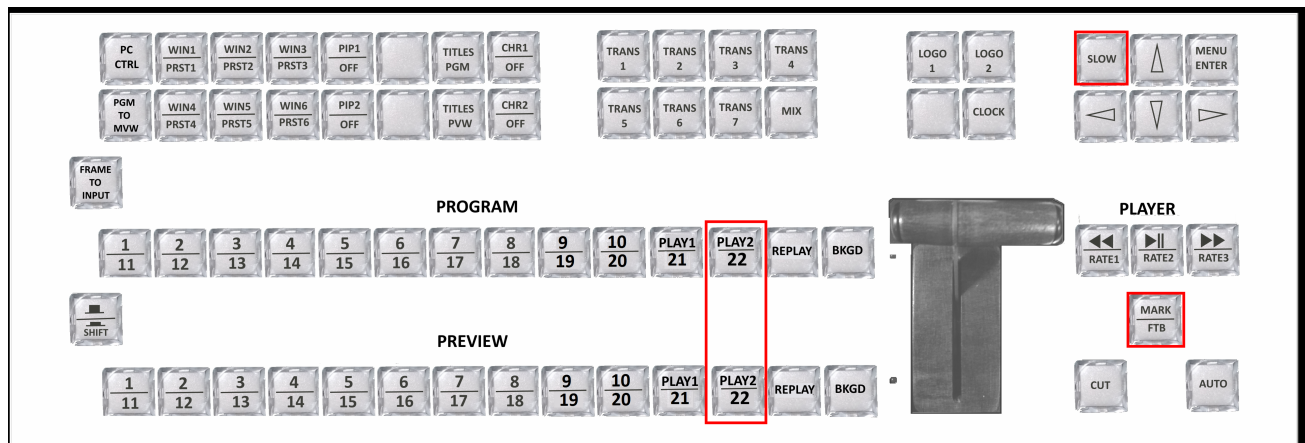


Fig. Buttons of operational management of a system of repetitions -" Replay System" on the RING-22 Control Panel.



Buttons of a source of repetitions in the lines "Program" and "Preview";



Button **MARK / FTB (Fade to Black)**.

Clicking that button does a plot mark in the system of repetitions.

By clicking together with previously pressed and holding "SHIFT" button, sets transition to a black field - FTB (Fade to Black);




The "SLOW REPLAY" button - switch on the reproduction of a system of repetitions which is slowed down by 2 times.

Operational management of replays from "Control Panel" of the Switcher:

1. We click "Replay" in the line "Preview", at the same time in the "Preview" window on the Multiviewer video signal **from the "Program"** will appear;



2. At the moment when it is necessary to make replay, press the button , at the same time in the window "Preview" on Multiviewer will appear Stop frame of video of repetition.

Pay attention that video repetition will begin not with that moment when there was pressed the key "MARK/FTB", but from the moment which was on **5 sec. earlier**.

3. To include repetition in Program by simple switching, it is necessary to click "CUT" or "Replay" in the line "Program" on the "Control Panel".

To switch on repetition in "Program", with effect of transitions "Stinger" or "Wipe", it is necessary to press button "Auto".

4. To finish reproduction of replay in "Program" with simple switching, it is necessary to press "CUT" or a necessary source in the line "Program" on the "Control Panel" again.

To finish reproduction of replay in "Program" with effect of transitions of "Stinger" or "Wipe", it is necessary to press "Auto" again.

4. For reproduction of the video review with slowing-down by 2 times,



before output it to the "Program", it is necessary to click

For switching on the normal speed of video playback of repetition it is necessary to click repeatedly the button "SLOW REPLAY".

It is important!

If the place on a SD card ended, then record stops and also "System of Replay" do not work.

19. Applications

19.1 Set of delivery.

1	Main unit	1
2	Control Panel unit	1
3	Cable for connection of the Main unit to the Control Panel unit. (DB9F – DB9M 1,5 m)	1
4	Cable for connection of the Main unit to the PC. (RG45 -RG45, 3m)	1
5	Power cable 220v	1
6	CD disk with the description, Programs and samples — templates files of logos and design of the screen of a Multiviewer	1

19.2 Soldering of the cable for connection to the remote Control Panel.

Connection to the Control Panel (or to the pushbutton station) is made by a cable with DB9F connectors (socket). It is included in the delivery package.

To Ring 22 ("keyboard") 9 pin F (socket)		To Control Panel ("keyboard") 9 Pin F (socket)	
1	N.C.	N.C.	1
2	TXD	TXD	2
3	RXD	RXD	3
4	N.C.	N.C.	4
5	GND	GND	5
6	N.C.	N.C.	6
7	N.C.	N.C.	7
8	N.C.	N.C.	8
9	+VCC (+12V)	+VCC (+12V)	9

The contacts which are not specified in the table - should be free.

19.3 Maintenance

The Switcher is expected on a continuous operating mode, however it does not cancel control of its state from technicians: periodic external inspection, cleaning of fans and internal space of the case from dust. Check of absence of mechanical damages, reliability of fastening of cables to connectors, Quality check of connection to a circuit of technological grounding.

At device insertion and in use elementary service regulations of complex electro technical devices should be followed: existence of protective and technological grounding, connection to the Switcher of other devices, that have common grounding bus with it, application of antistatic coverings in apartments where the device, providing optimum temperature condition etc. is installed).

19.4 Warranty obligations

The manufacturer guarantees operability of a video Switcher, and its compliance to the technical parameters stated in documentation or to special requirements mentioning in the contract between the vendor and the customer within 24 months from the date of sale to the ultimate user.

During guaranty period the owner has the right for a free technical support, and in case of a video Switcher exit out of operation - to free repair or a exchange. The guarantee does not extend to the shortcomings which arose owing to violation by the consumer of service regulations, storage or transportation of a product, actions of the third parties or other circumstances including the following cases (but without being limited to them):

1. If the shortcoming was a consequence of the negligent address, application an device not to destination, violations of conditions and service regulations, including owing to influence of high or low temperatures, high humidity or dust content, mismatch to standards of the parameters feeding telecommunication and the cables of networks, hits in the case of liquid, insects and other foreign objects and substances.

2. If the shortcoming was a consequence of unauthorized testing an device or attempts of modification of its construction or its program software, including repair or technical maintenance in the repair organization which is not authorized by the manufacturer.

3. If the lack of a product is shown in case of unsatisfactory work of communication networks, a body or broadcastings, owing to the insufficient capacity or network transmission capacity, power of a radio signal, operation of a product on border or out of a zone of steady reception of a radio signal of a communication network, a body or broadcastings, including because of features of a landscape of the area and its building.

4. The manufacturer does not bear responsibility for quality of work of the products together with the equipment of other vendors if it is not stipulated and is not tested at the conclusion of the order.

5. The shortcomings found in the period of device service life are eliminated with the manufacturer or authorized representatives. During guaranty period

elimination of shortcomings is made free of charge at production of documents, confirming the fact and date of signing of the contract buying and selling. In case of lack of the specified documents the warranty period is estimated from the date of production of goods.

6. The control and installation described in documentation attached to the device can be executed, both the user, and specialists of the authorized service centers of the corresponding profile, according to the contract signed by delivery.

7. Works on maintenance of devices (cleaning and technical inspection) it is made by the user independently and made according to recommendations about service of the equipment.

8. The manufacturer does not bear responsibility for the possible harm directly or indirectly caused with the products to people, property in case it resulted from non-compliance with rules and service conditions, storage, a transportation or installation of a product; deliberate or careless actions of a user or the third parties.

9. Under no circumstances the manufacturer does not bear responsibility for any special, accidental, direct or indirect loss or losses, including without limitation listed, the missed benefit, loss or impossibility of use of information or data, expenses on recovery of information or data, the losses caused by breaks in commercial, production or other activity.

10. The manufacturer accepts in repair the equipment irrespective of where when also by whom it was realized.

11. It is repaired at the manufacturer, on condition of delivery of the device a user to the manufacturer in case of his acquisition at the manufacturer, or under the terms of the contract with the representative of manufacturer.

12. Delivery is carried out at the expense of the user. Guarantee period lasts for the period of repair. Repair is carried out by the vendor within no more than five working days, without time of delivery and sending.

13. The Software (S) delivered together with a product extends by the principle "as is" if other is specially not stipulated.

As a rule, the majority of the difficult devices released by the manufacturer has a software support and a possibility of upgrade.

Found, during operation, defects of software can be eliminated free of charge.

Work on improvement of software is conducted constantly therefore software updating is provided not only during guaranty period, but also within 5 years if it allows by hardware of specific model.