

reckeen

3D STUDIO & life

INSTRUCTION MANUAL

ver. 1.3.1118

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The software described herein is governed by the terms of a separate user license agreement. Reckeen is not liable and will not compensate for any lost recordings or streamings made to your Reckeen 3D STUDIO or LITE, external recording media, or recording devices or any relevant losses, including when recordings are not made due to reasons including your Reckeen 3D STUDIO or LITE failure, or when the contents of a recording are lost or damaged as a result of your Reckeen 3D STUDIO or LITE failure or repair undertaken to your Reckeen 3D STUDIO or LITE. Reckeen will not restore, recover, or replicate the recorded or streamed contents made to your Reckeen 3D STUDIO or LITE, external recording media, or recording devices under any circumstances.



FCC NOTICE TO USERS

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Warnings and Precautions

1. Read carefully all of these warnings and save them for later reference.
2. Follow all warnings and instructions marked on this unit.
3. Unplug this unit from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not place this unit on an unstable cart, stand, or table. The unit may fall, causing serious damage.
5. Do not use this unit in or near water.
6. Slots and openings on the cabinet top, back, and bottom are provided for ventilation. To ensure safe and reliable operation of this unit, and to protect it from overheating, do not block or cover these openings. Do not place this unit on a bed, sofa, rug, or similar surface, as the ventilation openings on the bottom of the cabinet will be blocked. This unit should never be placed near or over a heat register or radiator. This unit should not be placed in a built-in installation unless proper ventilation is provided.
7. This product should only be operated from the type of power source indicated on the marking label of the AC adapter. If you are not sure of the type of power available, consult your dealer or your local power company.
8. Do not allow anything to rest on the power cord. Do not locate this unit where the power cord will be walked on, rolled over, or otherwise stressed.
9. If an extension cord must be used with this unit, make sure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord's rating.
10. Make sure that the total amperes of all the units that are plugged into a single wall outlet do not exceed 15 amperes.
11. Never push objects of any kind into this unit through the cabinet ventilation slots, as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind onto or into this unit.
12. Except as specifically explained elsewhere in this manual, do not attempt to service this product yourself. Opening or removing covers that are marked "Do Not Remove" may expose you to dangerous voltage points or other risks, and will void your warranty. Refer all service issues to qualified service personnel.
13. Unplug this product from the wall outlet and refer to qualified service personnel under the following conditions:
 - When the power cord is damaged or frayed;
 - When a liquid has spilled into the unit;
 - When the product has been exposed to rain or water;
 - When the product does not operate normally under normal operating conditions. Adjust only those controls that are covered by the operating instructions in this manual; improper adjustment of other controls may result in damage to the unit and may often require extensive work by a qualified technician to restore the unit to normal operation;

- When the product has been dropped or the cabinet has been damaged;
- When the product exhibits a distinct change in performance, indicating a need for service.

Warranty

For a period of one year from the original date of purchase of the product, Reckeen equipment is guaranteed against any manufacturing defects. The original purchase receipt or invoice or other documentary evidence is required. To obtain warranty service, you must deliver the product, in either its original packaging or packaging affording an equal degree of protection. You cover all mail, delivery, transportation and insurance costs. It is your responsibility to backup any data, software or other materials you may have stored or preserved on your unit. It is likely that such data, software, or other materials will be lost or reformatted during service and Reckeen will not be responsible for any such damage or loss. Our warranty doesn't cover damage caused by accidents or unauthorized modifications, installing any other software and repairs, misuse, sand, grit or water. All other claims of any nature are not covered by this warranty. This Warranty is valid only in the country of purchase. REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE CONSUMER. RECKEEN SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY ON THIS PRODUCT. EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ON THIS PRODUCT IS LIMITED IN DURATION TO THE DURATION OF THIS WARRANTY. Accessories, such as the battery or the cable, are excluded from the warranty. These terms do not affect your statutory rights.

DISPOSAL ELECTRICAL AND ELECTRONIC EQUIPMENT

SYMBOL FOR THE MARKING OF ELECTRICAL AND ELECTRONIC EQUIPMENT INDICATING SEPARATE COLLECTION: For Customers the countries within the EEA. EEA: European Economic Area, which comprises the EU member States plus Norway, Iceland and Liechtenstein.

WEEE Directive



The symbol – consists of the crossed-out wheeled bin, as shown above. The symbol is indicating that electrical and electronic equipment should not be disposed of as unsorted municipal waste, but segregated for separate collection. For more information about recycling of the product, please contact Reckeen office, the waste authority, the approved WEEE scheme or the dealer/distributor where you purchased the product.

Introduction

Until recently, the use of virtual studio technique has been available only for the major TV networks, due to its high costs. With development of computers and digital image processing techniques, now such solutions are becoming more and more common. Nowadays, they can be used not only by the major TV stations, but also by local stations, educational institutions (e.g. to create educational programs), as well as by various companies and organizations, e.g. for products' presentation or preparation of staff trainings, promotional or educational materials, etc.

Thus, the Reckeen 3D Studio product was created in order to meet the needs of this market segment. It is characterized by a very good price performance ratio paired with a simplified interface, which allows the operators to learn its usage very easily.

The Reckeen 3D Studio system is a ready to use solution - the user receives a complete workstation along with the preinstalled software and additional input/output cards mounted. The Reckeen 3D Studio enables connecting four cameras (4xHDMI or 2xHDMI and 2xSDI depending on version) and keying the signal. Instead of a camera, we can connect every video signal source e.g. laptops, tablets, video players and other computing devices.

Overview

The Reckeen 3D Studio is a PC-based system of a complete virtual 3D studio with the ability to import files in OBJ, 3MF and FBX formats and also available to prepare or download internal file formats *.recSets. In this case content is protected from modification and copying.

It is a system that enables a real time production of video programs with a high quality chroma key.

The Reckeen 3D Studio system uses four cameras in Full HD mode up to 60 frames per second and their images are keyed independently. The application allows you to work in 4K resolution. This means operating the system's up to 2 inputs and 1 output in 2160p format, i.e. with a resolution of 3840x2160. The chroma and luma key also work in 4K format. The system has 4 virtual cameras with the capability to save up to 15 shots for each of them. This allows the operator to use the following virtual camera movements in the scenography: pan, tilt, zoom, dolly, truck, arc, pedestal, cant and others.

Virtual cameras are controlled via the control panel Reckeen VKey100- specially dedicated to the system and equipped with a joystick.

Thanks to the built-in camera editor, you can program very impressive virtual camera movements and transitions in the 3D scenography, and with an innovative 3D set design editor Wizard installed on your system, you can modify and create your own unique studio designs.

This unique 3D scenography editor allows us to build "from scratch" our own 3D studio with available objects. The user as if he built blocks, builds his own scenography and then can modify the color, structure of the studio elements and many other properties. At the end, you can also set your own stage lighting by choosing the type of light , intensity and color.

Thanks to access to Microsoft Paint 3D we get the possibility to put into our scenography objects created with this program e.g. 3D subtitles.

The Reckeen 3D Studio system has a built-in STILL Editor for creating captions, text panels or news tickers - even during the Production.

In addition, the Reckeen 3D Studio system with four inputs for cameras and four chroma keys allows the user to place even four talents (a talent is an image of a presenter or an actor in front of a camera) on a single scenography.

It can also be used in a situation, where the images are transmitted by four cameras from different locations just to be placed in a single virtual scenography. The Reckeen 3D Studio system includes tools for recording, producing and online streaming the created live program. Reckeen can also be launched in LITE mode. In this situation , system deliver the tools for the creation scenography without 3d spatial knowledge. User can build as much more easier views based on pictures and images.

RECKEEN 3D STUDIO IS ACTUALLY 9 IN 1!

RECKEEN 3D Studio is a complete set of tools and functionalities you need to create, record and broadcast the high-quality 3D video content.

- Virtual Studio
- Mixer
- Still Editor – captions and graphic boards generator
- Studio Editor Wizard – stage design wizard
- 3D Studio Editor
- MS 3D PAINT editor
- Recorder
- Streamer
- Reckeen LITE system – the platform's simpler version for quick tasks and for the beginners.

Functions and features of the system

The main purpose of the system is to provide the operator with all the tools necessary to produce a live program. Projects of this type require simultaneous actions on multiple image sources. To make this possible, the Reckeen 3D Studio system enables receiving external signal sources connected to the input card. Virtual cameras are controlled via the control panel Reckeen VKey100- specially dedicated to the system and equipped with a joystick. Additionally, it generates multiple signal sources from files on the hard drive replayed by the system players.

Available system inputs:

- cameras – up to two 4K camcorders or up to four Full HD (4x HDMI or 2xHDMI and 2x SDI – depending on the version). Reckeen LITE studio offers a Full HD resolution. By purchasing additional License Key, You can upgrade it to 3D Studio &LITE with 4K resolution,
- media (movies) - two clips at the same time,
- still images (bitmaps, panels) - two at a time,
- text - two text compositions at the same time,
- Sound – one clip from file and sound from Microphone,
- Two analog inputs and one microphone in front panel,
- By connecting an additional Reckeen Audio Box ADB-100, you can increase the number of inputs: two analog inputs ,one microphone and two digital inputs,
- Up to 6 NDI stream inputs.

The system takes a 'live' image from the camera. In the case of media, some additional functions are available:

- Media tray is an easy-to-use interface that brings all the media needed for broadcasting the program together in one place
- You can transfer media from the tray to the players or use them during the broadcast and as a source in virtual 3D studios
- The system has 7 trays for different types of media: video, still images, still text and audio files
- There is a possibility to insert a logo, text or animation to the scene thanks to 2 x DSK function and triggers option.

It not only supports the media, but also offers:

- Camera shots editor for programming virtual camera movements and transitions within each 3D studio
- Up to 15 shots in trackless mode for each virtual camera
- 30 free 3D set designs added to the system
- Virtual 3D studio editor

- Eye-catching news tickers and captions created in STILL Editor or loaded from external files.
- Wizard editor - Create your own 3D studio
- LITE Production - launch Reckeen Lite

Presenting previews of the media being played. There are the following previews available:

- preview from four cameras,
- media preview (two at the same time),
- still images preview (two at the same time),
- texts preview (two at the same time).

There are also broadcasting previews:

- PREVIEW - presenting the element prepared for broadcast,
- PROGRAM - presenting the signal currently being broadcast (system output),
- 4 virtual cameras V/C previews.

Additionally, the system enables:

- showing previews on multiple monitors. (If the monitors are connected to the workstation, it is possible to obtain a different previews' configuration on up to three monitors.)

Formats of system input:

- PAL 4x3
- PAL 16x9
- NTSC 4x3
- NTSC 16x9
- 720p50 – image resolution: 1280 x 720
- 720p59.94 – image resolution: 1280 x 720
- 720p60 – image resolution: 1280 x 720
- 1080i50 – image resolution: 1920 x 1080
- 1080i59.94 – image resolution: 1920 x 1080
- 1080i60 – image resolution: 1920 x 1080
- 1080p25 – image resolution: 1920 x 1080
- 1080p29,97 – image resolution: 1920 x 1080
- 1080p30 – image resolution: 1920 x 1080
- 1080p50 – image resolution: 1920 x 1080
- 1080p59.94 – image resolution: 1920 x 1080

- 1080p60 – image resolution: 1920 x 1080
- 2160p25 – image resolution: 3840 x 2160
- 2160p29,97 – image resolution: 3840 x 2160
- 2160p30 – image resolution: 3840 x 2160

Formats of system output:

- 720p50 – image resolution: 1280 x 720
- 720p59.94 – image resolution: 1280 x 720
- 720p60 – image resolution: 1280 x 720
- 1080i50 – image resolution: 1920 x 1080
- 1080i59.94 – image resolution: 1920 x 1080
- 1080i60 – image resolution: 1920 x 1080
- 1080p25 – image resolution: 1920 x 1080
- 1080p29,97 – image resolution: 1920 x 1080
- 1080p30 – image resolution: 1920 x 1080
- 1080p50 – image resolution: 1920 x 1080
- 1080p59.94 – image resolution: 1920 x 1080
- 1080p60 – image resolution: 1920 x 1080
- 2160p25 – image resolution: 3840 x 2160
- 2160p29,97 – image resolution: 3840 x 2160
- 2160p30 – image resolution: 3840 x 2160

Formats of video processing:

- Video processing:
 - 4: 4: 4 16-bit floating-point internal processing;
- Inputs and outputs:
 - SDI - YUV 4: 2: 2;
 - HDMI – RGB , YUV 4: 2: 2 , YUV 4: 4: 4;
- Capture in output format:
 - 4: 2: 0;
- Streaming:
 - 4: 2: 2.

Other additional features

- Control panel Reckeen VKey-100 with additional joystick to control the virtual cameras;
- real-time streaming of the program including YouTube , Facebook and Ustream ;
- Choice of skins Style for the system: White or Black ;
- Ability to load 3D objects created with Microsoft Paint 3D ;
- Jack 6,3 mm Microphone connection, 2 XLR channels Line inputs, Jack 6,3 mm Headphones connection - channels monitoring .
- Additionally connections by use Reckeen Audio Box ADB-100: Jack 6,3 mm Microphone connection, 2 XLR channels Line analog inputs, 2 XLR channel Digital inputs, Headphones connection - channels monitoring.



Reckeen 3D Studio system
configuration

2

SYSTEM REQUIREMENTS

System Reckeen requires a minimum of one PC monitor in Full HD resolution (up to 3 Full HD monitors connected to the chosen graphic card ports), Camera with SDI or HDMI output - 4 pcs (4 pcs HDMI Cameras or 2 pcs HDMI and 2 pcs SDI Cameras depending on the chosen version of system inputs) , a PC keyboard – 1 pc. and a mouse - 1 pc. Cables for video signal connetions: 4xSDI or 2xSdi and 2xHDMI depending on version. In addition, it is possible to connect another 4th monitor for preview.

CONNECTIONS - FRONT PANEL



Reckeen 3D Studio System is housed in 19" 4U Rackmount chassis.

Dimensions in mm : 483 (W)x528(D)x177 (H) , Dimensions in inches : 19,02"(W)x20,79"(D)x6,97"(H)
Weight approx. in kg : 15,5 , Weight approx. in lb: 34,2

After opening right or left panel doors different elements can be accessed. Access to the front panel doors is secured . This safeguard protects the system from accidental shut down or reset . Below the security lock there are two USB 3.0 ports.

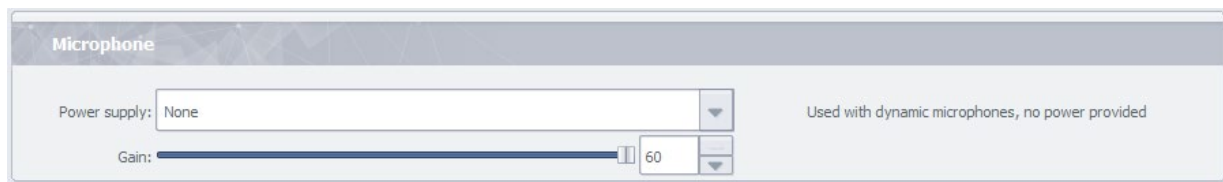


After opening the right door, you will have access to the red Reset button, located next ,the system Start button, and the Audio Panel.

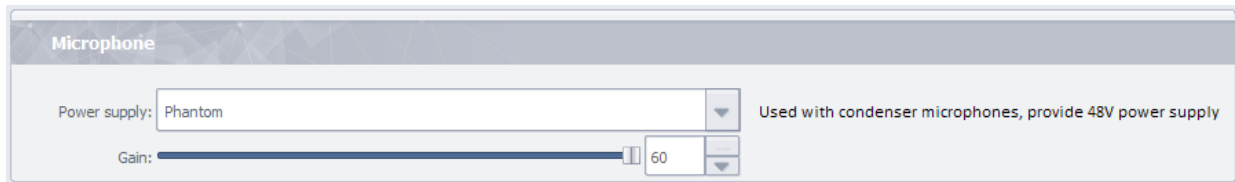
Audio Panel connections

- Digital
 - embedded stereo on each SDI and HDMI
- Analog
 - 2 x XLR two channels – professional balanced analogue audio stereo differential input (-10dBV, or 4dBu)
 - 2 x Jack 6,3mm two channels – professional balanced analogue audio stereo differential input (-10dBV, or 4dBu)
 - 1 x MIC Jack 6,3mm – microphone differential input - two types of microphones – dynamic and condenser with + 48V phantom

System Reckeen supports 2 types of microphones. Every type requires different power supply as listed below:



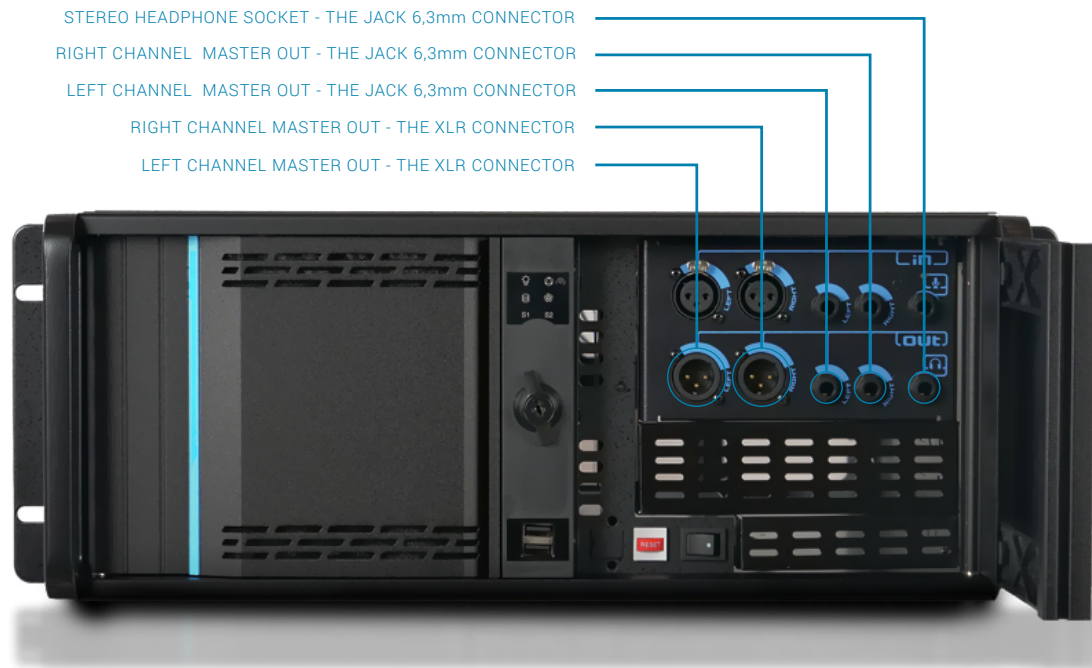
Dynamic



Condenser

Warning! Before connecting the microphone, read the chapter: Configuration Window: Audio Tab.

When you open Configuration Window in 3DProduction Module or LITE Production Module : Menu>Options>Configuration. You can find Microphone Settings below the Audio Level settings. There are two operating modes: a None mode with a dynamic microphone, for which you can set the Gain value with a slider, and a Phantom mode with a condenser microphone. When switch to the Phantom mode, you will be warned that a voltage of 48 V (volt) will be applied to the speech insert. A red LED lights up on the Audio Panel located at the front of the Reckeen workstation. It is recommended not to connect or disconnect a microphone to the Audio Panel during the time the red LED is lit up. You can safely connect a microphone only in None mode.



Audio output

• Reckeen SDI Virtual Studio System

- Digital
 - embedded stereo on each SDI and HDMI
- Analog
 - 2 x XLR two channels – professional balanced analogue audio stereo differential output (-10dBV, or 4dBu)
 - 2 x Jack 6,3mm two channels – professional balanced analogue audio stereo differential output (-10dBV, or 4dBu)
 - 1 x Jack 6,3mm – stereo Headphone output

• Reckeen HDMI Virtual Studio System

- Digital
 - embedded stereo on each HDMI
- Analog
 - 2 x XLR two channels – professional balanced analogue audio stereo differential input (-10dBV, or 4dBu)
 - 2 x Jack 6,3mm two channels – professional balanced analogue audio stereo differential input (-10dBV, or 4dBu)
 - 1 x Jack 6,3mm – stereo Headphone output

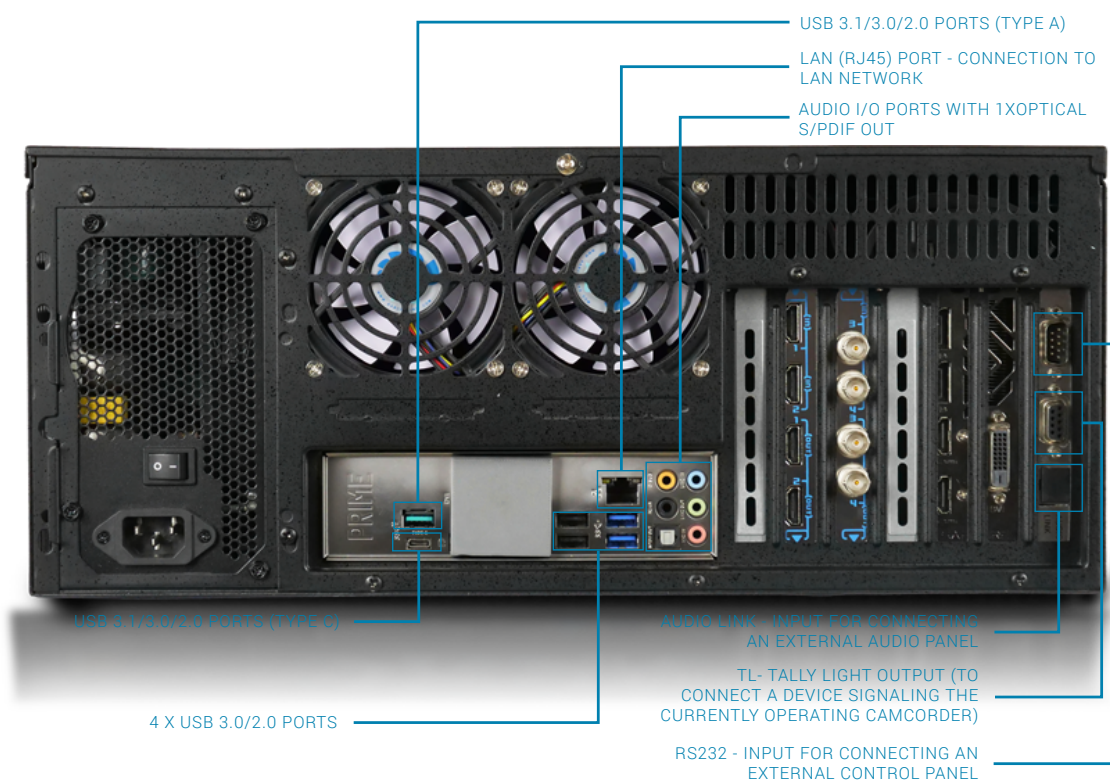


It is recommended that the workstation is placed in such a way that permits the airflow to the front and the rear panel. Fans for proper system cooling are mounted behind the left door's panel and in the rear of chassis. Slots and openings in the back of the workstation casing are provided for ventilation, to ensure reliable operation of the equipment and to protect it from overheating. The workstation casing is suitable for installation in server racks, taking up space of 4U.

CONNECTIONS - REAR PANEL

I/O Port

- Tally Output
 - TL – DB9 – 4 channels
- Reckeen External Keyboard port
 - RS – DB9 – RS 232
- Reckeen External Audio port
 - LAN – Audio Link
- Ethernet
 - Gigabit Ethernet LAN
- PC/2
 - PC keyboard
- USB
 - 2 x USB 2.0 (front panel)
 - 4 x USB 3.0 (back panel)
 - 1 x USB 3.1 (back panel)



Power



Switches power On/Off , 0 – OFF 1 – ON



Power supply cord with a suitable plug will be supplied depending on the user location

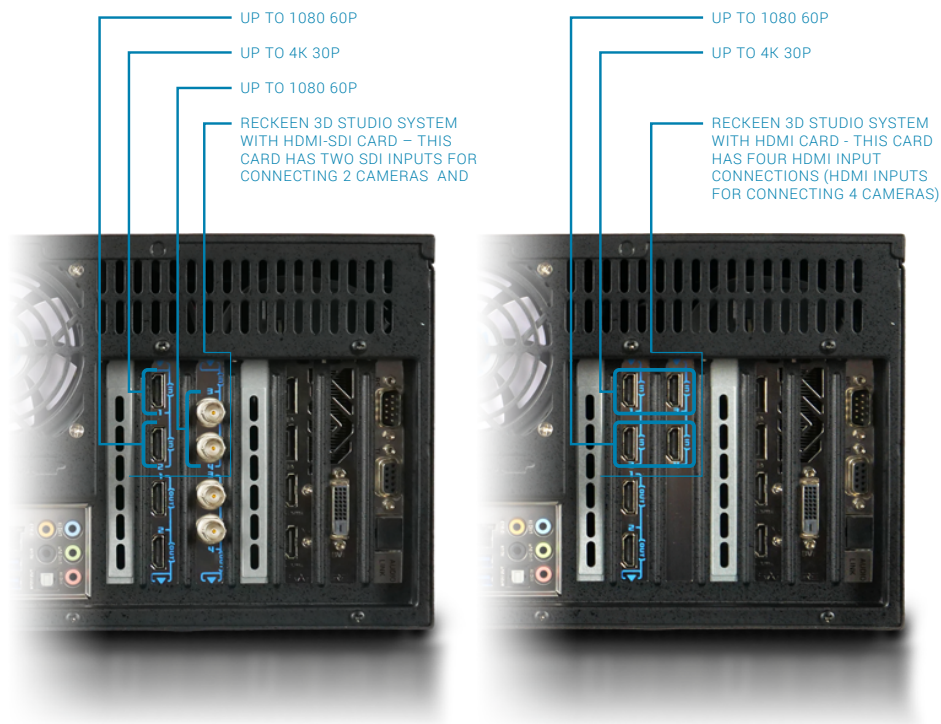


Connections - Reckeen
3D Studio cards' inputs/
outputs

3

Video Input

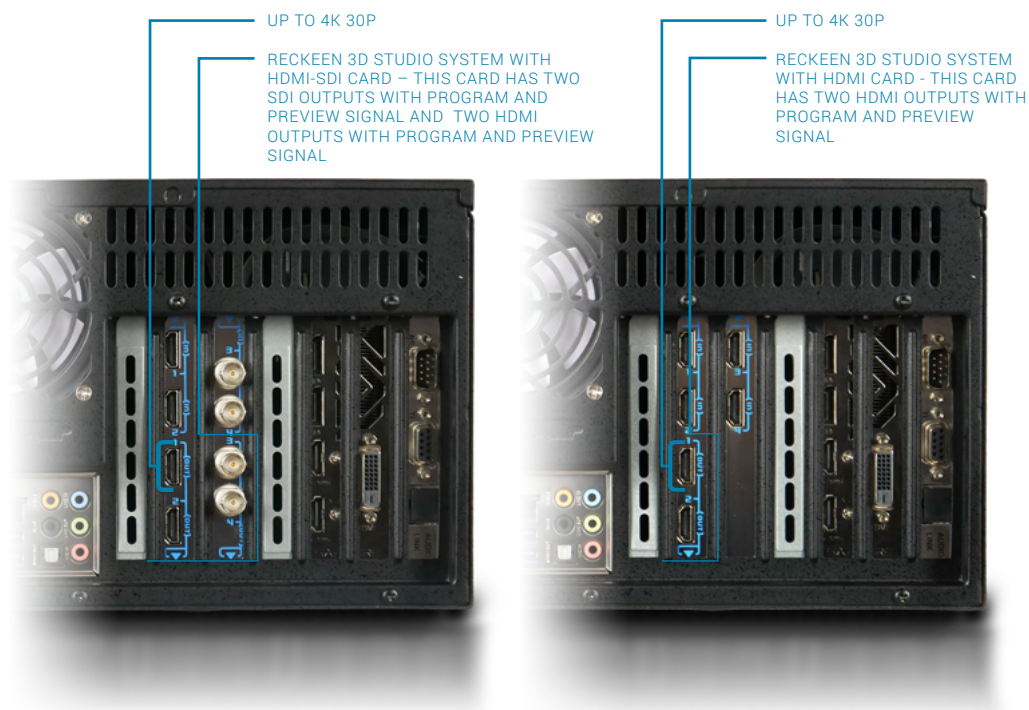
- Reckeen SDI Virtual Studio System
 - SDI Video Input
 - 2 x SDI – 3G/HD/SD auto switching
 - HDMI
 - 2 x HDMI 1.4 type A connector with support for 1080p60 one up to 4k30p format*
- Reckeen HDMI Virtual Studio System
 - HDMI
 - 4 x HDMI 1.4 type A connector with support for 1080p60 two up to 4k30p format*



Video Output

- Reckeen SDI Virtual Studio System
 - SDI Video Output
 - 2 x SDI – 3G/HD
 - HDMI
 - 2 x HDMI 1.4 type A connector with support for 1080p60 one up to 4k30p*
- Reckeen HDMI Virtual Studio System
 - HDMI
 - 2 x HDMI 1.4 type A connector with support for 1080p60 one up to 4k30p*

*Reckeen LITE studio offers a Full HD resolution. By purchasing additional License Key, You can upgrade it to 3D Studio &LITE with 4K resolution.



Monitor Output

(the number and type of outputs depends on the current version of the graphics card)

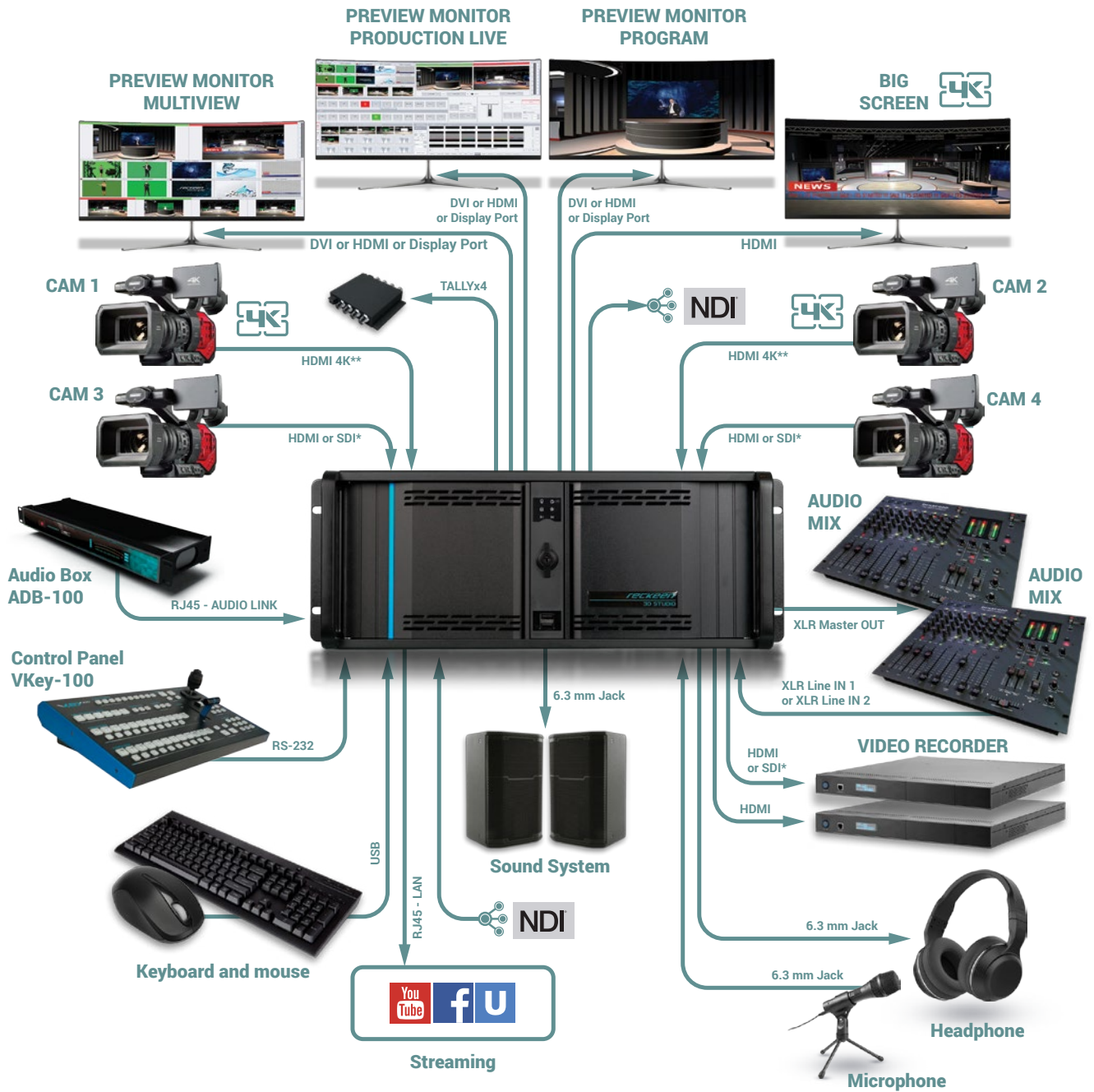
- 2x DP output for monitor
- 2x HDMI output for monitor
- 1x DVI-D output for monitor



4



Reckeen 3D Studio system
connections diagram



*SDI connectors only in Reckeen 3D Studio version with HDMI-SDI card

**Virtual LITE studio offers a Full HD resolution.

By purchasing additional License Key, You can upgrade it to 3D Studio &LITE with 4K resolution.

5



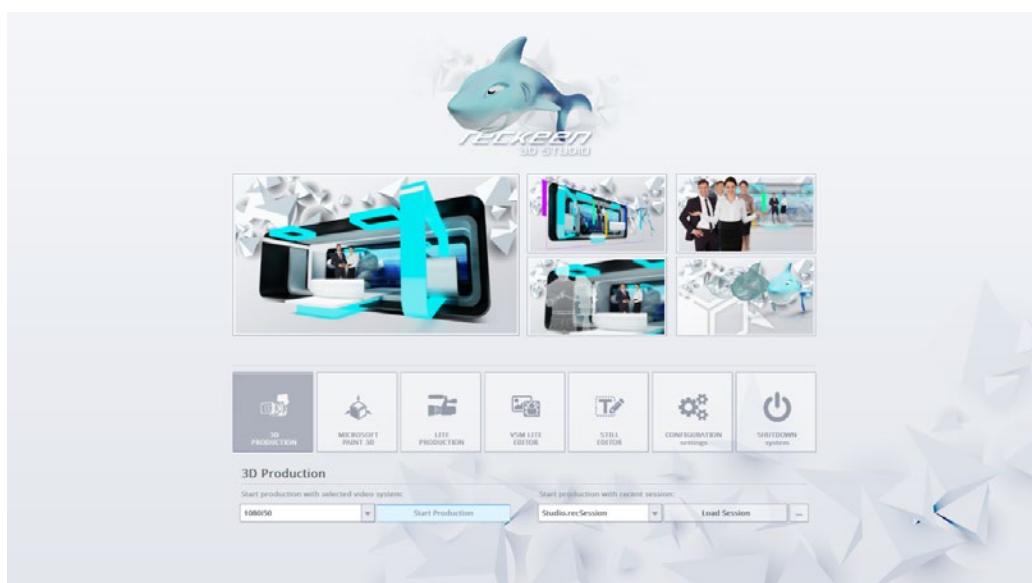
Reckeen 3D Studio System Startup

1. Connect a [power cord](#), a [PC keyboard](#), a [mouse](#) and a [control panel](#) V-Key100 to the Reckeen workstation.
2. Connect one, two or three [Full HD monitors](#) to the workstation using [HDMI](#), [DVI](#) or [Display Port](#) on the graphics card. Recommended resolution is [1920x1080](#) . It is not recommended to connect monitors with different resolutions.
3. Set the [power switch](#) located on the rear panel of the workstation to position [1 - enabled](#). Open the right door of the front panel and press the [button](#) starting the Reckeen system for a couple of seconds. This [button](#) is located on the right side of the [red reset button](#).
4. Important: if you ignore all the messages during the startup process (which can approximately take up to one minute), you will be redirected automatically to the [Reckeen Studio Start screen](#). For more information, see the [System Recovery section](#).
5. During the first use of the system, the user is obligated to confirm the [EULA](#) End-user license agreement. For detailed description go to the [About](#) section in [CONFIGURATION](#) settings.
6. There are eight options to choose from on the [Start screen](#) (In Version3D + LITE):
 - [3D PRODUCTION](#) – start the video production in [3D Mode](#)
 - [MICROSOFT PAINT 3D](#) – run [Paint 3D](#) Program
 - [LITE PRODUCTION](#) – run [Reckeen LITE](#) and start the video production [LITE Mode](#)
 - [VSM LITE Editor](#) – start the [Reckeen Virtual Space Maker LITE](#) editor
 - [STILL Editor](#) – start the [STILL Editor](#)
 - [CONFIGURATION](#) settings – application configuration
 - [RSS](#) – five windows with manufacturer's information about [news](#), [events](#), [promotions](#), etc.
 - [SHUTDOWN](#) – shuts down the system or close application

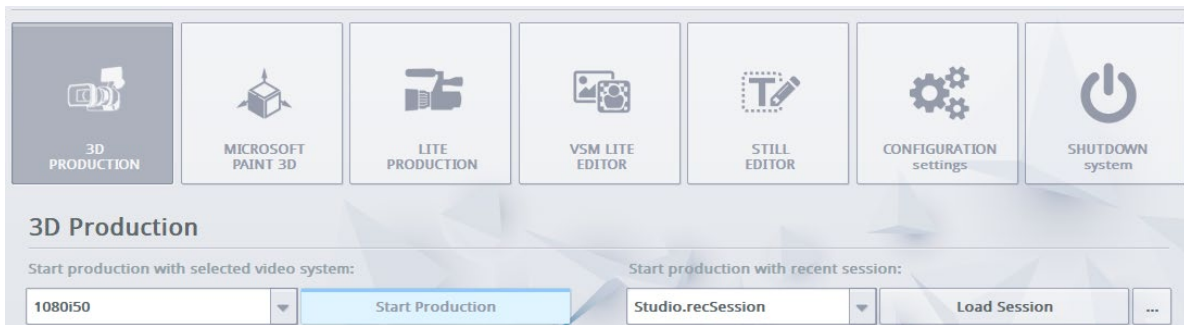
The detailed description of each option can be found in the following sections of this manual.

START SCREEN VIEW

The start screen appears automatically when you launch the Reckeen 3D Studio system.

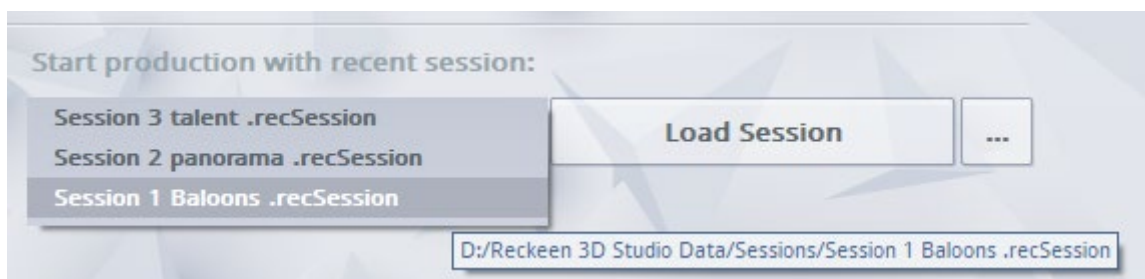


3D PRODUCTION



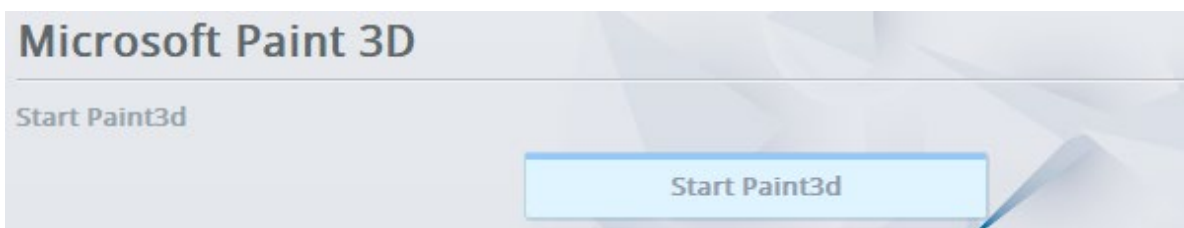
Before starting a new production, first you should choose an appropriate video format, that is a format of the Reckeen 3D Studio system signal output. Click on the 3D PRODUCTION button, and then select the [format](#) in which you will be working from the drop-down menu , next to the icon labeled [Start Production](#). Keep in mind for the choice to be consistent with your camera's working format.

You can also load a file from a previously saved production session. The system has its own session files*.recSession. Session files contain [production settings](#), [video clips](#), [graphics](#), [logo](#), [sound](#), [program options](#), [key settings](#), [streaming settings](#) and other. Select a [saved session](#) from the drop-down menu, next to the cursor arrow will appear a path to the file on the disk , as shown below, and click on the [Load Session](#) button.



You can also search the hard drive to load a previously saved session. It is done by clicking on the button with [three dots](#) located next to the Load Session icon.

MICROSOFT PAINT 3D



After you click [Microsoft Paint 3D](#) button and then [Start Paint 3D](#) button, you will be redirected to Microsoft Paint 3D. You can create there your own 3D objects and save them in * [.3MF](#) format on the disk. After

closing Microsoft Paint 3D program, you automatically return to Reckeen 3D Studio's start screen. You can load the created 3D object (e.g. a [3D text](#)) to your stage design after clicking [3D PRODUCTION](#) button and opening [3D Studio Editor](#).

Paint 3D program gives you enormous opportunities, like:

- You can sketch the drawing and then quickly change it into a three dimensional object.
- You can use the ready-made solids, build objects with their use, paint them, change their sizes and so on.
- Realistic textures, such as wood, grass or others, can be applied to your objects.
- You can create clippings from your favorite images or photos and use them as stickers to be put on your 3D models.
- You can show your 3D objects on www.Remix3D.com, where you can also find and use thousands of other users' creations.

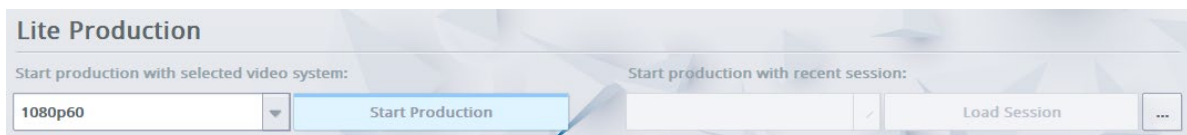
You want a car to appear in your studio? It's very easy - you can create it from scratch or use one of the existing pieces of work!

You can put the created objects into Reckeen 3D Studio system and enjoy the results of your work. Microsoft has released a series of video tutorials for [Paint 3D](#):

- https://www.youtube.com/watch?v=K6l5lH2y_zl
- https://www.youtube.com/watch?v=FnYUN-_zGAU
- <https://www.youtube.com/watch?v=aMNG4-sS3cY>

Before you begin working with [Microsoft Paint 3D](#), please read the terms of [Microsoft Services Agreement](#). They are available at: www.microsoft.com

LITE PRODUCTION

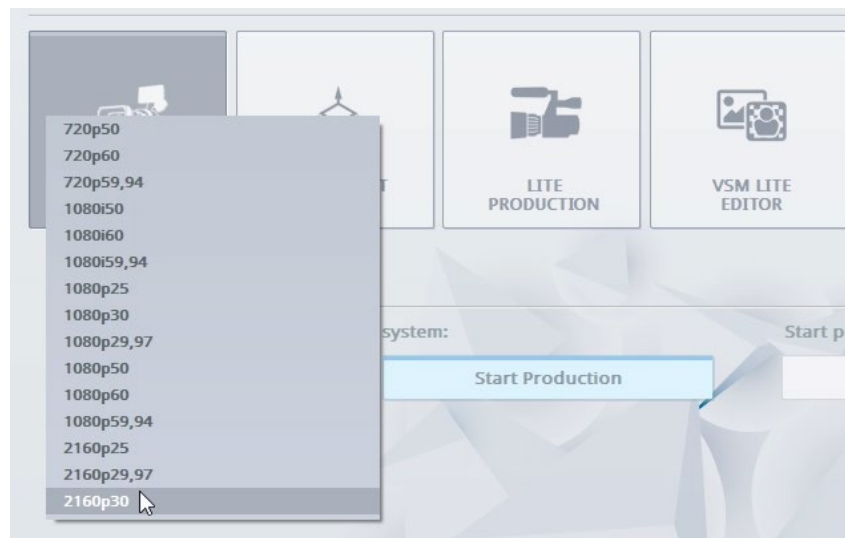


When you press [LITE Production](#) button, the same options appear on the screen as with the [3D Production mode](#). You have to choose the right format and load the session. Reckeen LITE mode will start after clicking [Start Production](#) button.

4K RESOLUTION

The Reckeen system allows you to work in 4K resolution. This means operating the system's up two inputs and 1 output in 2160p format, i.e. with a resolution of 3840x2160. The chroma and luma key also work in 4K format. Reckeen LITE studio offers a Full HD resolution. By purchasing additional License Key, You can upgrade it to 3D Studio & LITE with 4K resolution. In addition, up to two of the inputs, depending on the system version, namely CAM 1 and CAM 3 to which we connect HDMI signal, allows us to connect 4K input signal. We choose CAM1 input for 4K signal.

Before we start working with 3D PRODUCTION or LITE PRODUCTION application, in the STARTUP module, we have to select an appropriate video output format. We do this using a drop-down list located below the buttons. This time, we have added new output formats, labeled 2160p. Picture below.

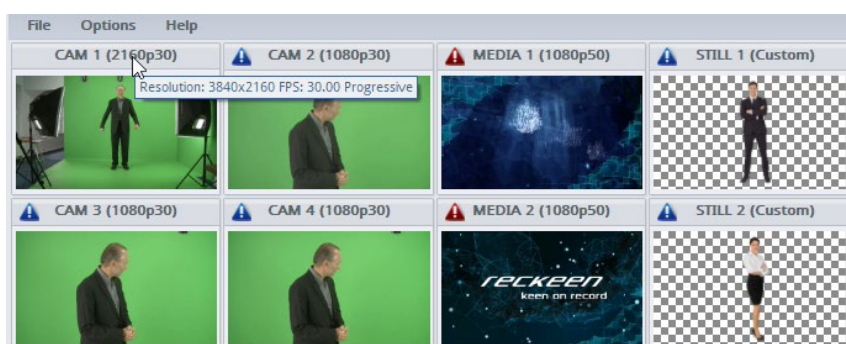


They are characterized by four times the number of pixels compared to Full HD resolution used previously. It is a resolution of 3840 x 2160.

We can choose from among 3 progressive scan operating modes, that is full frame frequency: p25, p29,97 and p30.

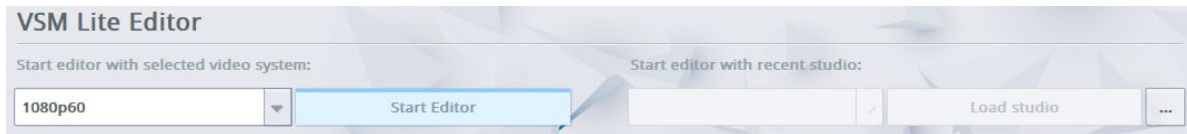
We will choose 2160p30 format and press START PRODUCTION button. We will obtain this resolution at the RECKEEN card's PROGRAM output after starting the system and loading the Production module. On the second output - PREVIEW - we get a resolution of 1080p30.

We will get information about this resolution when we hover the cursor over input bar. Picture below.



We suggest to always match the refresh rate of the input image to the output, as in this case: progressive signal p30.

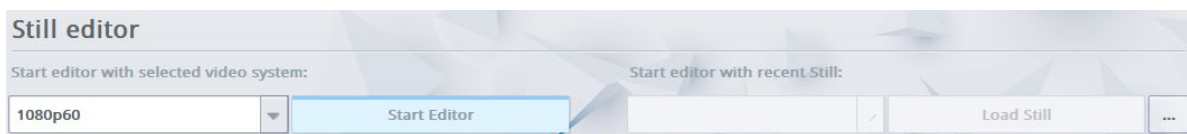
VSM LITE EDITOR



Virtual Space Maker LITE Editor has been designed to edit and introduce changes to the ready-made sets, but also to allow the users to create their own set designs. Such sets are intended for Reckeen LITE system. Just as with the previous options, in order to start the editor you have to choose the image system in which you are going to create your set design. You can launch the editor with the latest scenery ([Start editor with recent studio](#)) or load the scenery from the computer disk ([Load studio](#)). Loading a scenery is also possible later on while the editor is already running. VSM LITE Editor is also available as a standalone application to be installed on your [PC](#) or [laptop](#).

STILL EDITOR

Also from the Start screen you can start the [STILL Editor](#). It is a program for [creating text](#) and [graphic panels](#). You can prepare, for [example](#), [subtitles](#), [logos](#) or [news tickers](#) - which will later appear on screen. First, select from the drop-down menu an appropriate resolution, consistent with resolution of production video, and then click on the [Start Editor](#) button. You can also load a previously saved file by selecting it from the drop-down menu or by searching your hard drive, as in the previous example.



CONFIGURATION SETTINGS

Here are five functions available in this option [Language](#), [Style](#), [Update](#), [Free sets](#) and [About](#).



- Language
 - Clicking on this icon allows you to change the system language.
- Style
 - Choice of skins Style for the system: White or Black.
- Update
 - After clicking on the Update icon, the system searches for software updates.

- If no new available versions appear in the window, it means the system is fully up-to-date.
- Free sets
 - The system Reckeen comes with 30 free 3D sets and 30 free Lite sets.
 - After clicking on the button, follow the on-screen instructions. You have to create an account.
- About
 - When you click on this button the End-User License Agreement (EULA) appears in a separate window along with the current software version number and card's serial number at the bottom of the window.

RSS

RSS module is a place where information about [news](#) , [events](#), [promotions](#) and [products](#) is sent by the [manufacturer](#). There are five windows on the start screen. Remember that in order to receive it, it is necessary to have an Internet connection.



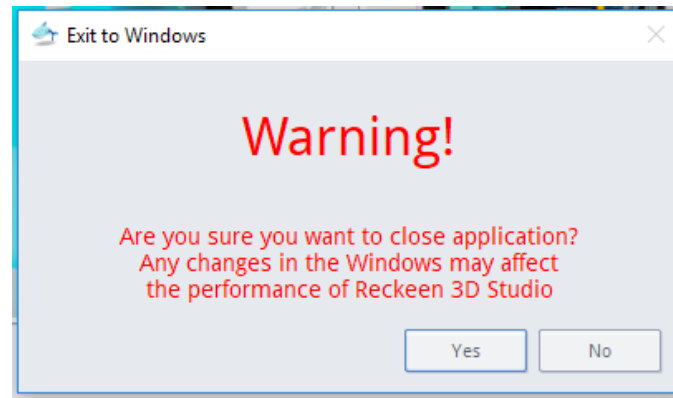
SHUTDOWN SYSTEM

You have two possibilities here: [Shutdown system](#) and [Close application](#).



Clicking on the [Shutdown system](#) icon - shuts down and turns off the workstation, while clicking on the [Close application](#) icon allows for closing Reckeen 3D Studio application and going to Windows operating system.

Note: After clicking, a window with a warning appears.



6



Still Editor

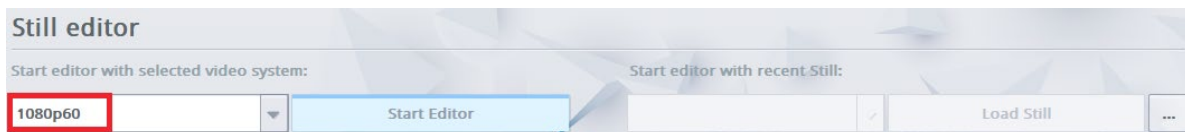
Still Editor - is an additional module for creating **text panels**, complementary to the **Production** module. It allows you to create aesthetic and impressive compositions in the form of graphic files with texts, e.g. news tickers. The **text panels** created in this manner can be used during the program broadcast, for example on the **DSK layer**. They may contain images created in any kind of graphics program (like a logo) and texts.

It is possible to set all the essential elements of texts: **content**, **type**, **size**, and **font attributes**. Additionally, you can set the caption's **scale** and **position**, choose a **color** or **add a contour** and a **shadow**. **Text panels** created with **STILL EDITOR** have a very significant advantage over the graphics prepared in other graphic programs. You can modify their content in real-time during the production stage (in the **Production module**). It allows you to use them as templates of, for example, news tickers, where you can quickly and easily enter a new content without changing the graphic elements.

After creating the **text panel's** project, you can save it as a **virtustill** file or export it as a **PNG** file.

STILL EDITOR MODULE START

Still Editor module is launched from the start screen. First, choose the appropriate resolution from the drop-down menu, then click on the **Start editor button**. The image system of your choice should match the system of **Production module** that will be launched later on. If, for example, the signal format from your camera is **1080p60** (which corresponds with a resolution of **1920x1080**), it is recommended to open the editor in the same resolution.

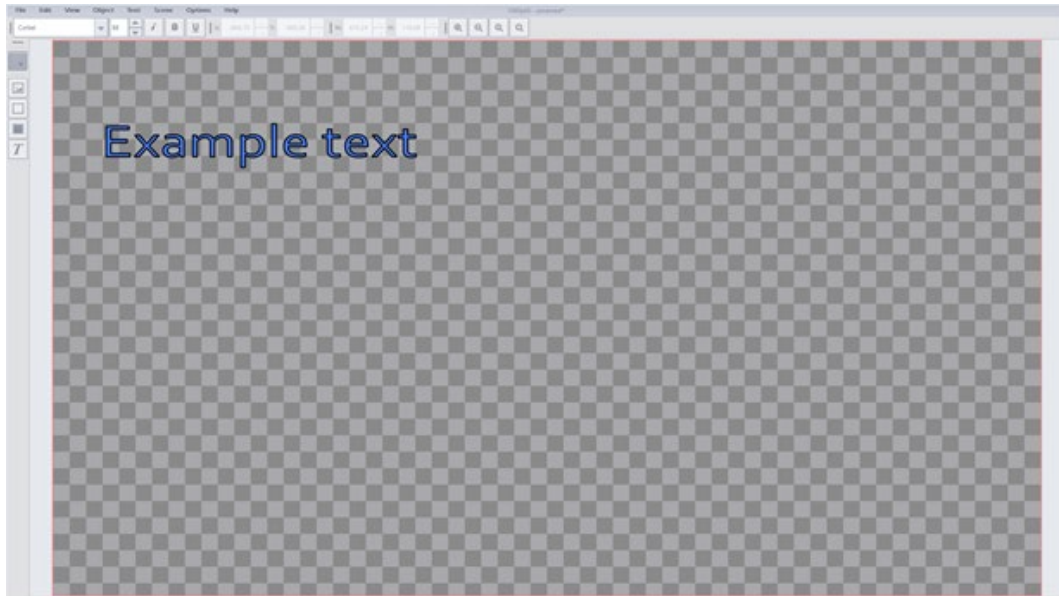


At the **Still Editor** module startup, you can also load a previously saved file by selecting it from the drop down menu after clicking on the **Load Still** icon (a list of recently opened files will be displayed) or by searching your hard drive by clicking on the icon with **three dots**.

APPLICATION SCREEN

On the application screen you can see a characteristic grid in the background. It indicates an **alpha channel**, that is **transparency**.

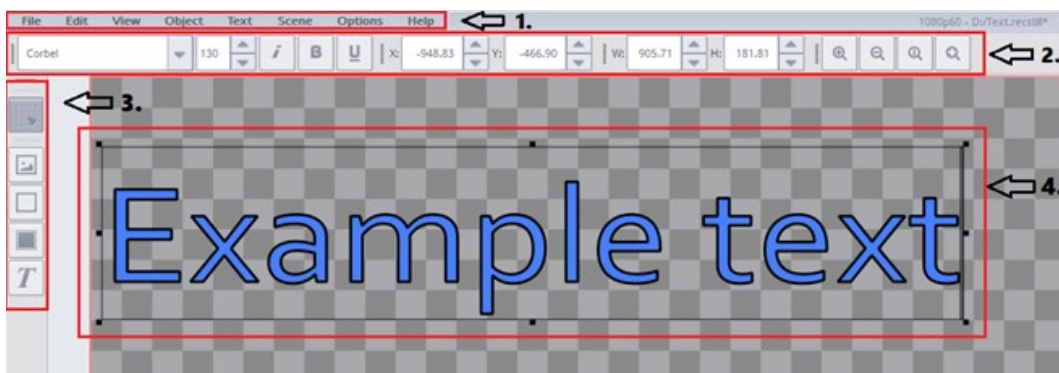
Everything that will be placed on the working area, for example a **text**, an **picture**, a **frame**, or a **rectangle**, will be visible on a transparent background. The working area is of the same size and proportions as the production screen. This means the text's position and size corresponds to the real view on the screen later.



View: application screen

On the application screen, the following can be distinguished:

1. Menu bar,
2. Horizontal toolbar,
3. Vertical toolbar,
4. Working area (image below)



Menu bar

Menu bar is located in the top left part of the screen. You can find 8 main options there: [File](#), [Edit](#), [View](#), [Object](#), [Text](#), [Scene](#), [Options](#) and [Help](#).

Horizontal toolbar,

Below the menu bar, you can find a horizontal toolbar. It allows for quick access to tools related to the

text's font (font type, size, italic, bold, underline), positioning of the inserted objects (picture, text, frame, or rectangle), and changes in the view of the scene (zooming in - zooming out).

Vertical toolbar,

On the left side of the screen, starting from the top, a vertical toolbar is placed. Its icons allow for a quick access to editing options - Add: insert object (picture, frame, rectangle, text) and select object mode.

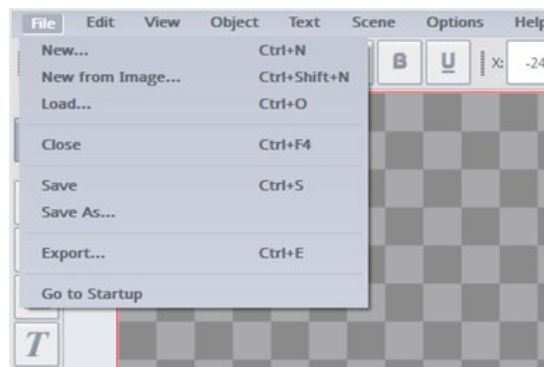
Working area,

In this area, the items (text, picture, frame, rectangle) are placed. What is visible in the working area will later appear on Preview or Production screen. It is therefore important to select an appropriate image system at the start of the Still Editor module, for example 1080i50. Image system in which you are working is displayed at the top of the screen, next to the name of the file.

MENU BAR

Menu bar is located in the top left side of the screen. Below, further sub-options, that show up when you click on the main option, are shown.

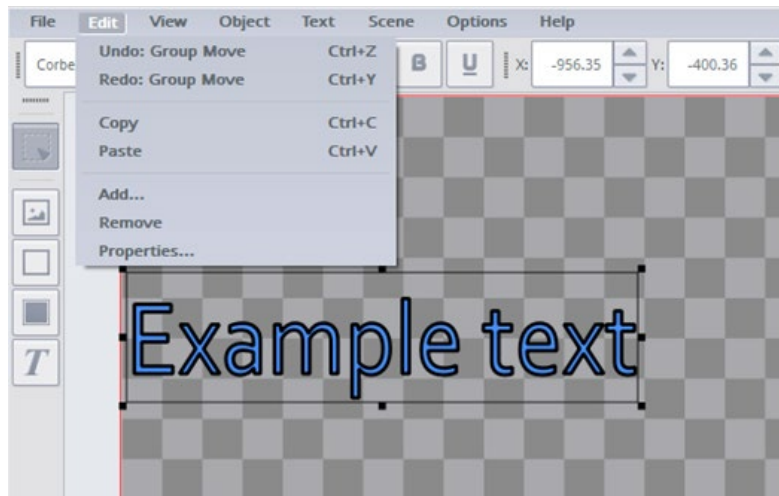
MENU BAR – FILE



- **New** - create a new **virtustill** file of the text panel
- **New from Image** - to create a new **text panel** a background of which is loaded from an image file.
- **Load** - load an existing **virtustill** file
- **Close** - close the currently opened file with a possibility to save changes
- **Save** - save changes to the current project in the **virtustill** file
- **Save As** - save the project file under a different name
- **Export** - allows you to save the project as an image in **PNG** file with **transparency** (alpha channel) preserved.
- **Go to Startup** – quit the editor

MENU BAR – EDIT

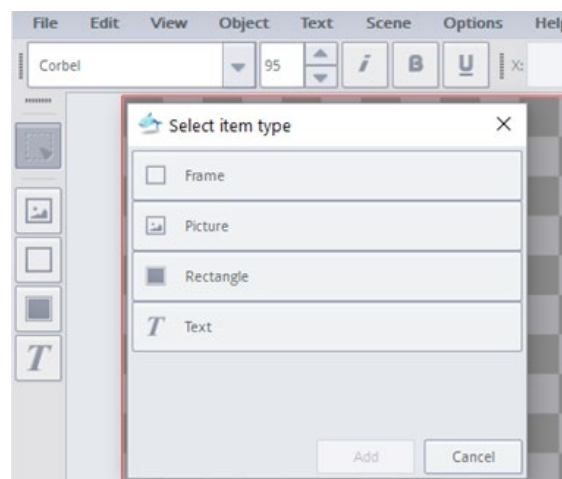
All the sub-options are shown in the picture below.



- **Undo** - Deletes the last change in the editor
- **Redo** - Reverses the Undo command
- **Copy** - Copies the last selected item (text, picture, frame, rectangle)
- **Paste** - Pastes the previously selected item
- **Add** - Enables inserting objects (picture, frame, rectangle, text) into the working area. For quick access this function is also available in the form of icons on the vertical toolbar. See the next image.
- **Remove** - deletes the selected item

EDIT - CHARACTERISTICS OF ITEMS: TEXT, FRAME, RECTANGLE AND PICTURE

Properties - after selecting an item (**picture**, **frame**, **rectangle**, **text**) on the working area, it allows you to modify its properties



Here, we will discuss in detail the properties of individual items that can be placed into the working area - on the example of Text item. Other items ([Frame](#), [Rectangle](#), and [Picture](#)) have the same number or a smaller one of properties.

Text, Outline, Shadow and Positioning functions

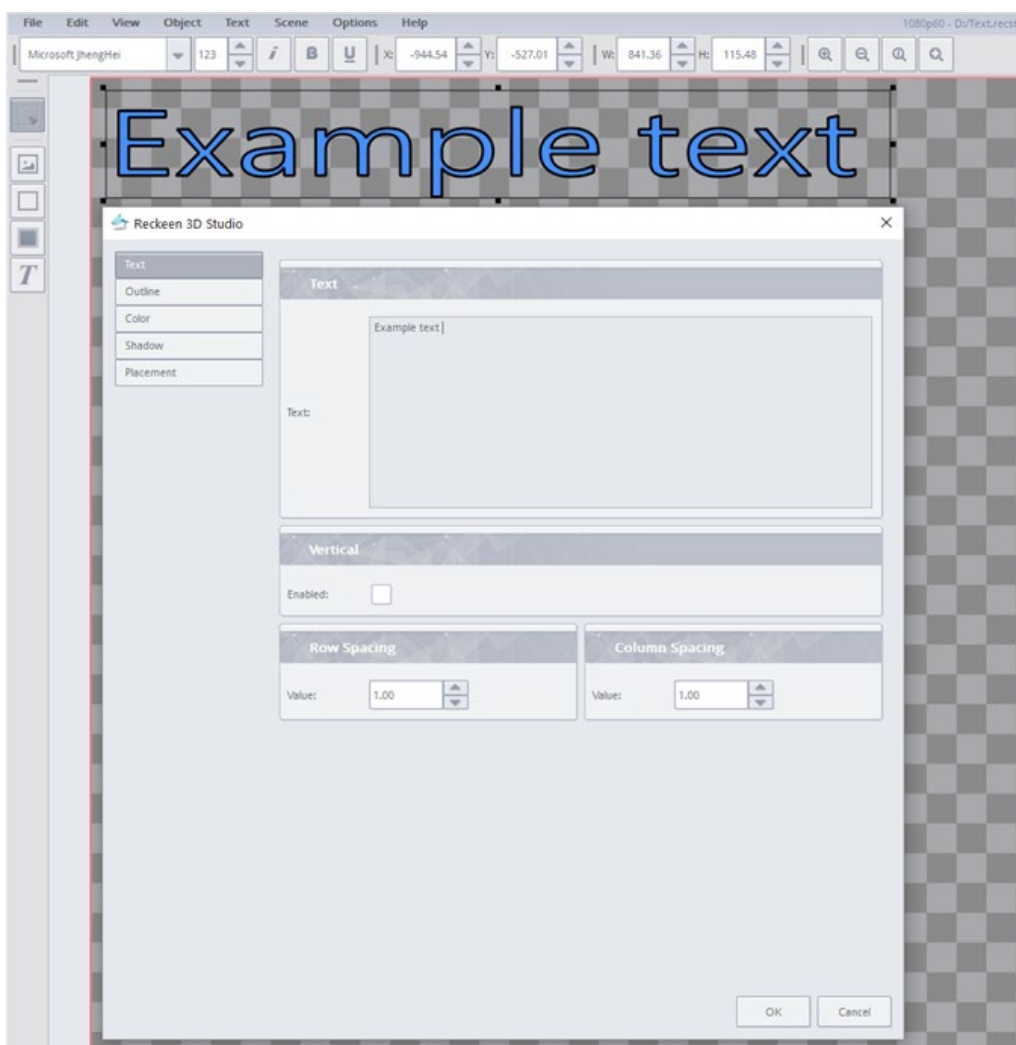
After opening [Text Properties](#) window, in the upper left corner you can find five main functions to choose from allowing you to edit captions: [Text](#), [Outline](#), [Color](#), [Shadow](#) and [Positioning](#).

Text function

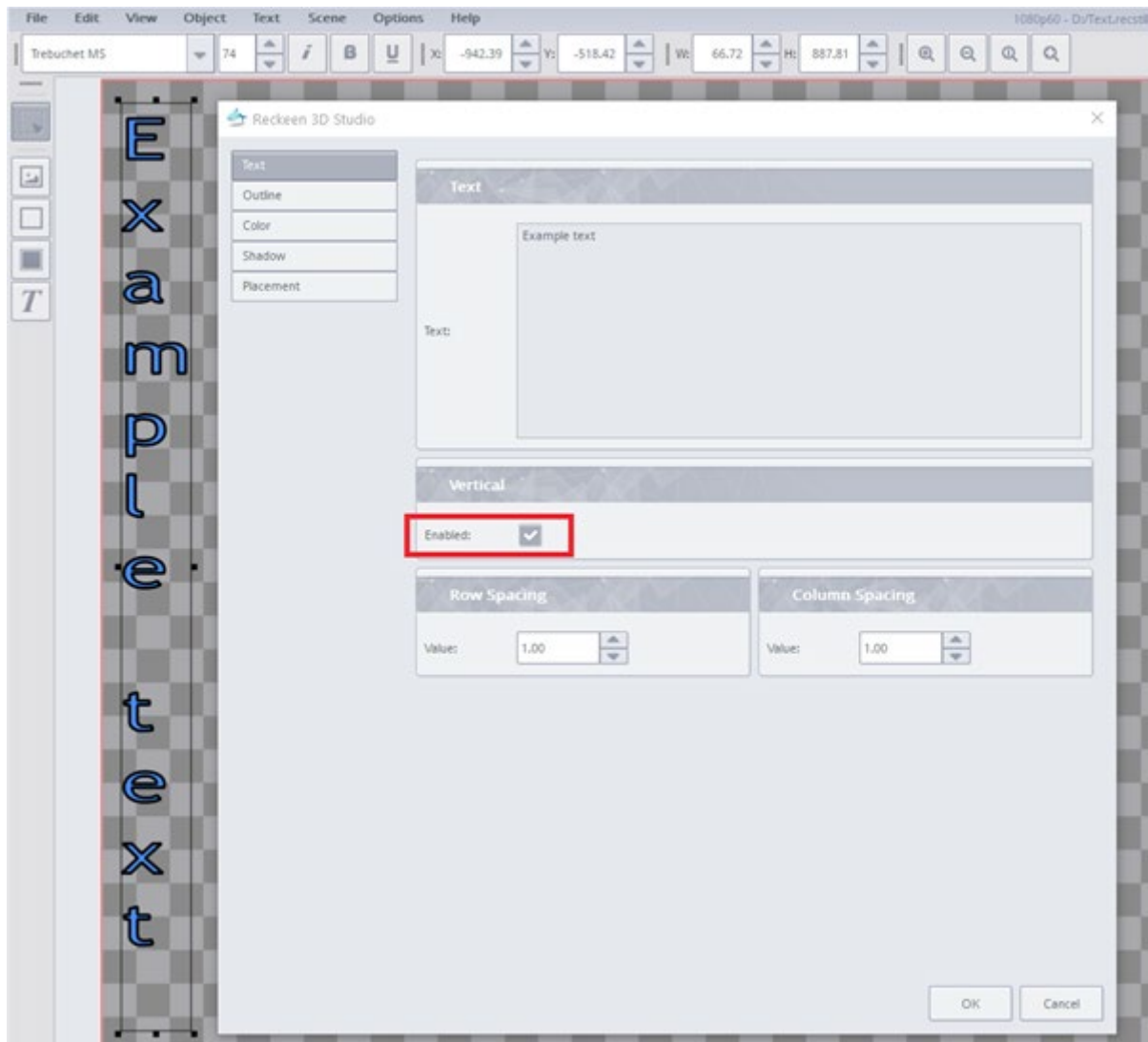
In the image below you can see an open window of [text item](#) properties with the [Text function](#). In the highlighted box there is a place to enter caption's text that is to appear on screen.

The text can also be entered without opening this window, that is directly on screen with a keyboard, after clicking the [left mouse](#) button once on the caption's text .

You can also open the [object's options](#) window with a [double-click](#) of the [left mouse](#) button and enter the caption's text in the [edit box](#). The [text's size](#) and [font](#) are set by [default](#).



Another way to edit the text is to enable the [Vertical](#) option. Selecting this option will result in text's rotation by 90 degrees. See the image below.



In this window, you can also set the text's [Row Spacing](#) and [Column Spacing](#). The values of both functions are set by default to 1.00.

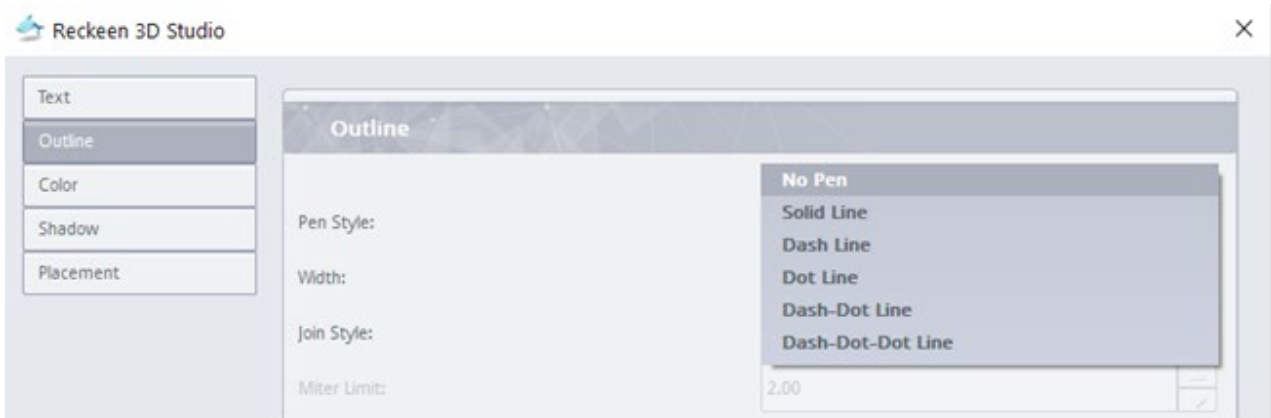
OUTLINE FUNCTION

Outline function allows you to edit captions' contours.

Due to the changing screen background during the broadcast, the entirely monochromatic captions may disappear at certain moments, when the [background color](#) is the same as the text's. For this reason, borders are added to the text with a color contrasting with the caption's filling. The most commonly used version are white letters with a black outline, and this option is set as a default when creating texts.

The Outline function enables using different kinds of [Pen Styles](#), that is texts' borders.

We can choose: [No Pen](#) - captions will have no contour, or one of the following options: [Solid Line](#), [Dash Line](#), [Dot Line](#), [Dash-Dot Line](#) and [Dash-Dot-Dot Line](#).



Width is a next useful option. When you change its value, the width of text's contour changes. See the image below.

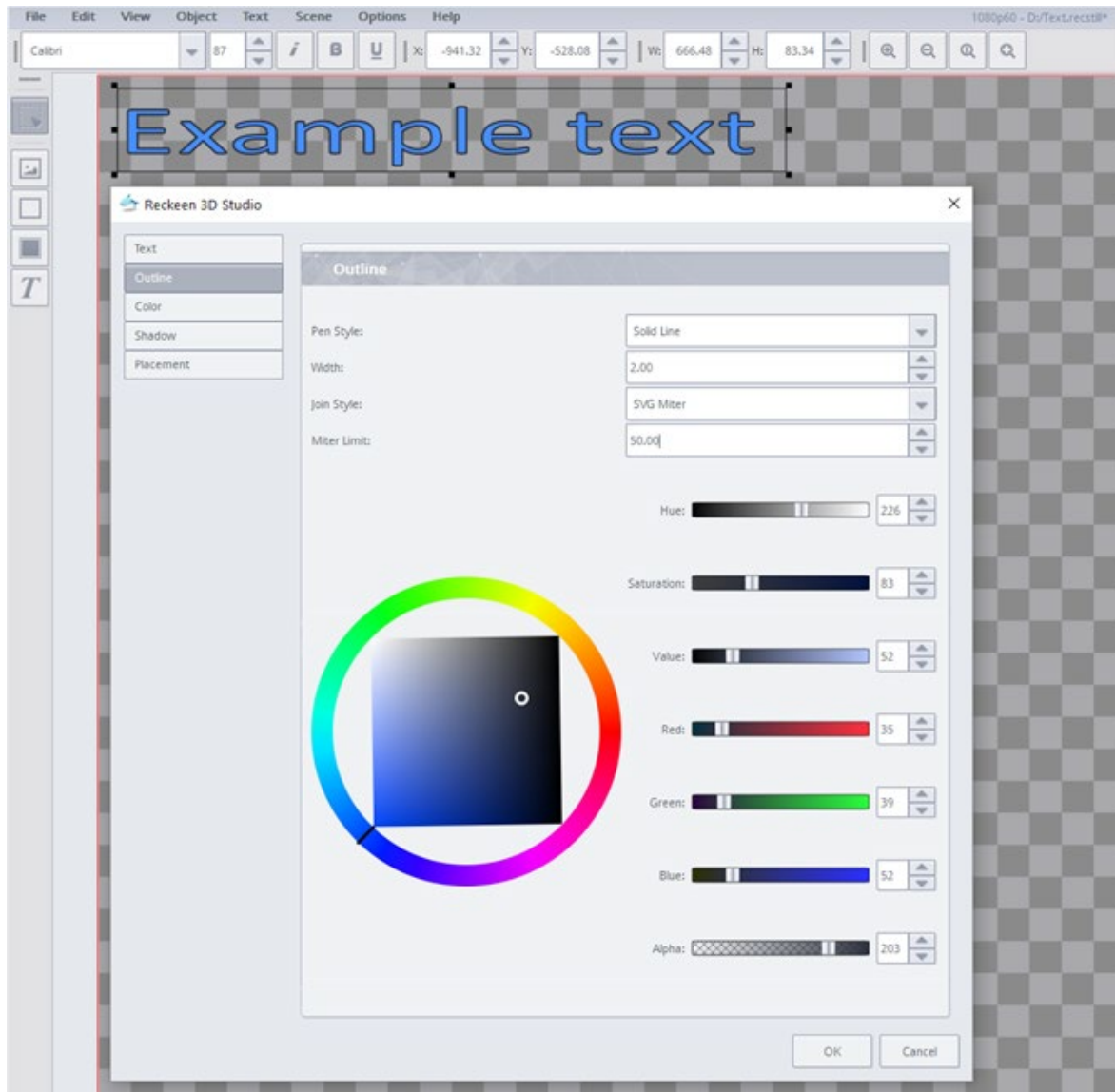


Possibility of setting yet another option - **Join Style** allows you to change the shape of texts' contour. See the image below.



The captions can be more rounded (**Round**, **Bevel**) or rather sharp (**Miter**, **SVG Miter**). Value of the **miter limit** can be adjusted, if your font and its contour requires so. You can also set the color of the **text's contour** (border).

The color wheel shown in the picture below is based on **the RGB model** (**Red**, **Green**, **Blue**) extended with **transparency** and also **Hue**, **Saturation**, **Value**, and **Alfa channel** (which is transparency).



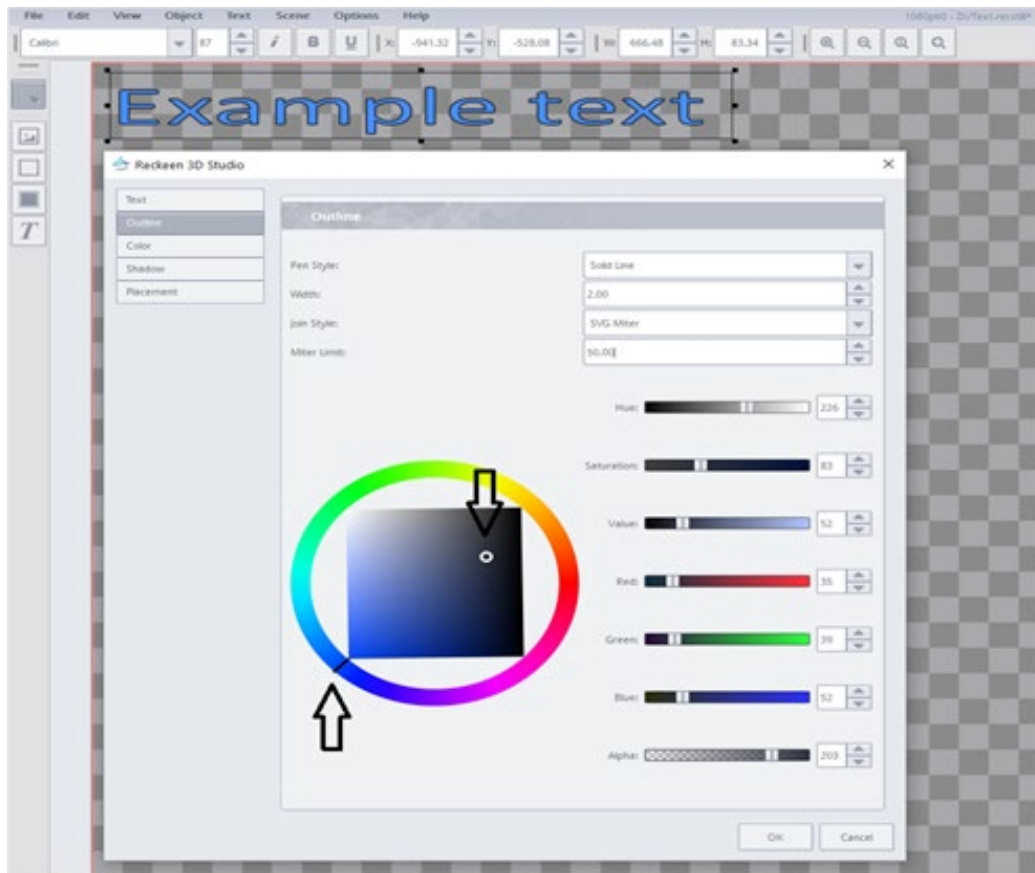
Texts' color can be set using the sliders located on the right side of the screen:

- **Hue** - the hue parameter corresponds to the colors on the edge of the color wheel, starting from 0 (red), through 120 (green) and 240 (blue) to 360 (red). By changing the slider's value, the position of an indicator line on the wheel is changed.
- **Saturation** - the value of saturation parameter ranges from 0 (white) to 255 (100% full saturation), by changing its value with a slider, a circle's position along one of the square's sides changes.
- **Value** - the brightness parameter encompasses the range from 0 (black) to 255 (100% bright color of a given hue and saturation), by changing its value with the slider, the circle's position along one of the square's sides changes.
- **Transparency** is set with an **Alfa** slider - the transparency parameter ranges from 0 (fully transparent, invisible border) to 255 (100% full visibility). You can also use the cursor to set all the above values (except the **Alpha** channel). The cursor has to catch on the line indicator pointed with a lower white arrow in the picture below.

Changing the position of the line indicator on the wheel allows you to set the color by changing the Hue parameter.

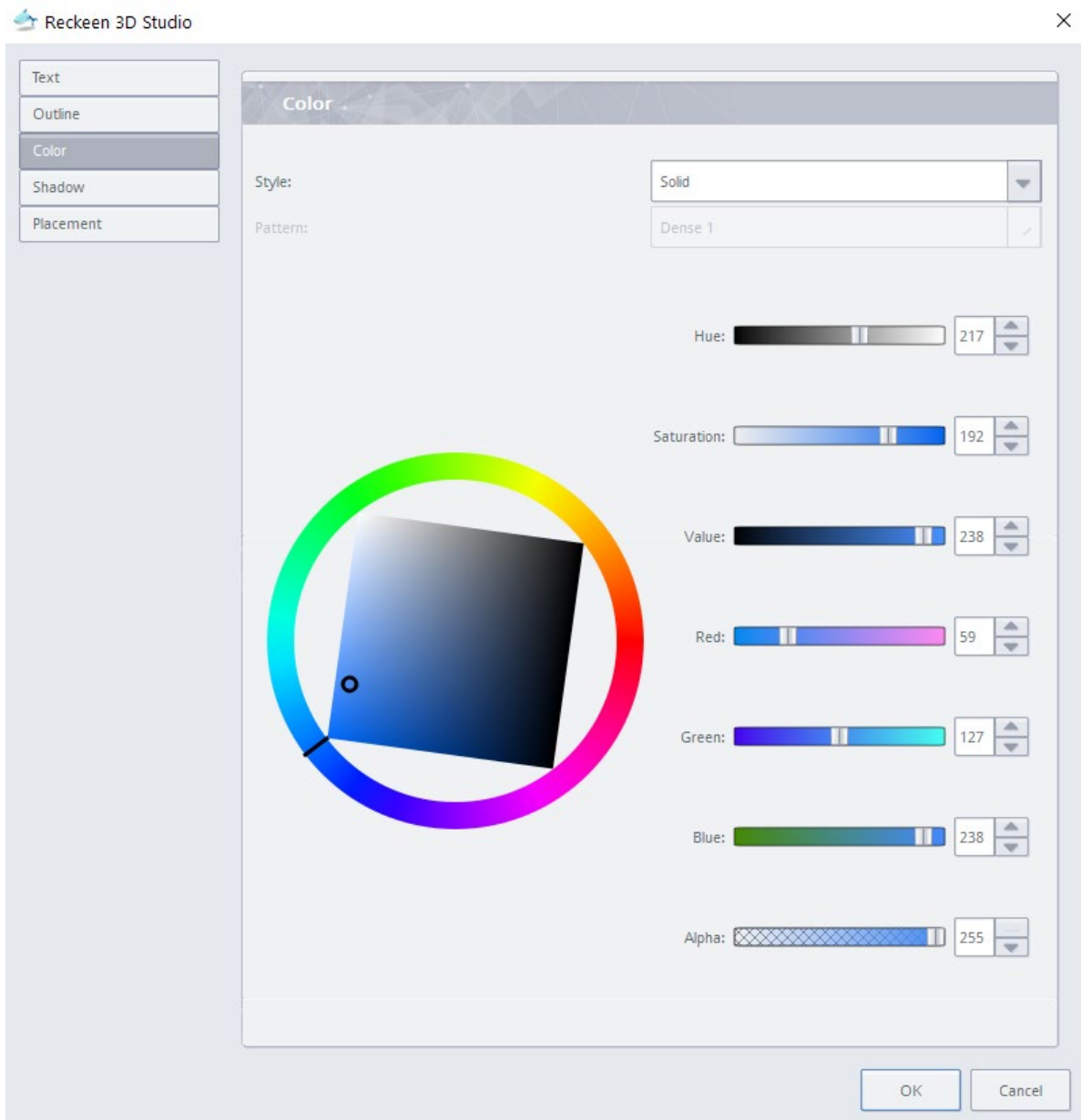
If the cursor is caught on the circle indicated by an upper white arrow, you can move it inside the square. This allows you to change all the other parameters apart from the [Alfa](#).

The current color will be visible in the middle of the white circle.



COLOR FUNCTION

Thanks to the Color function, you can design the text's filling, including the selection of a fill [color](#) or a fill [pattern](#). See the image below.

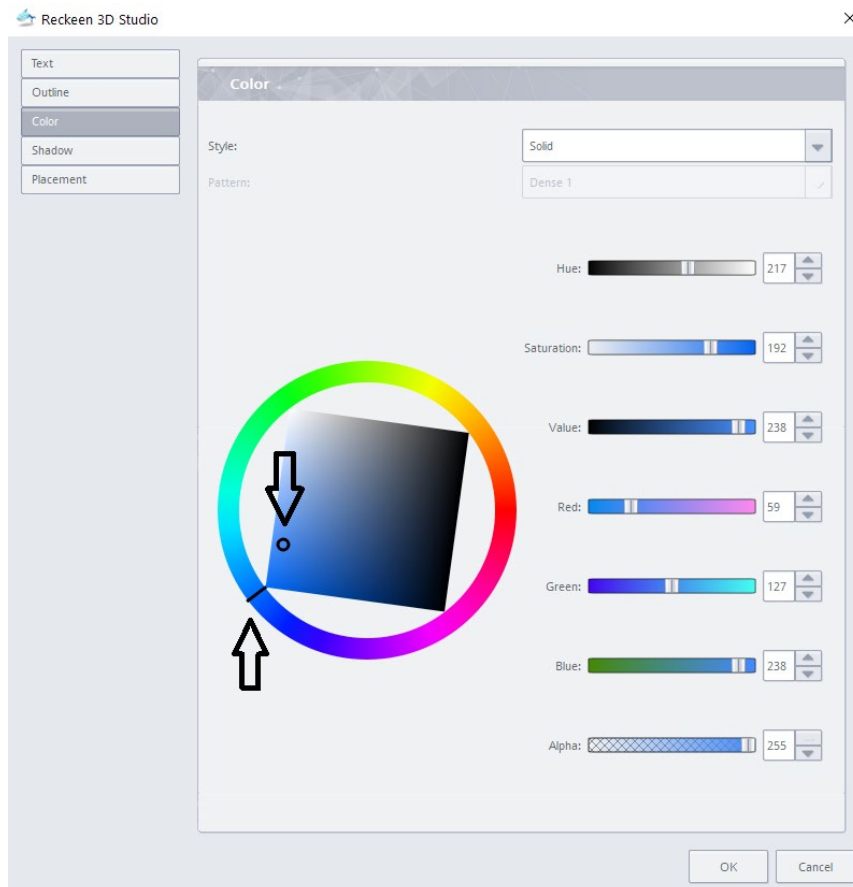


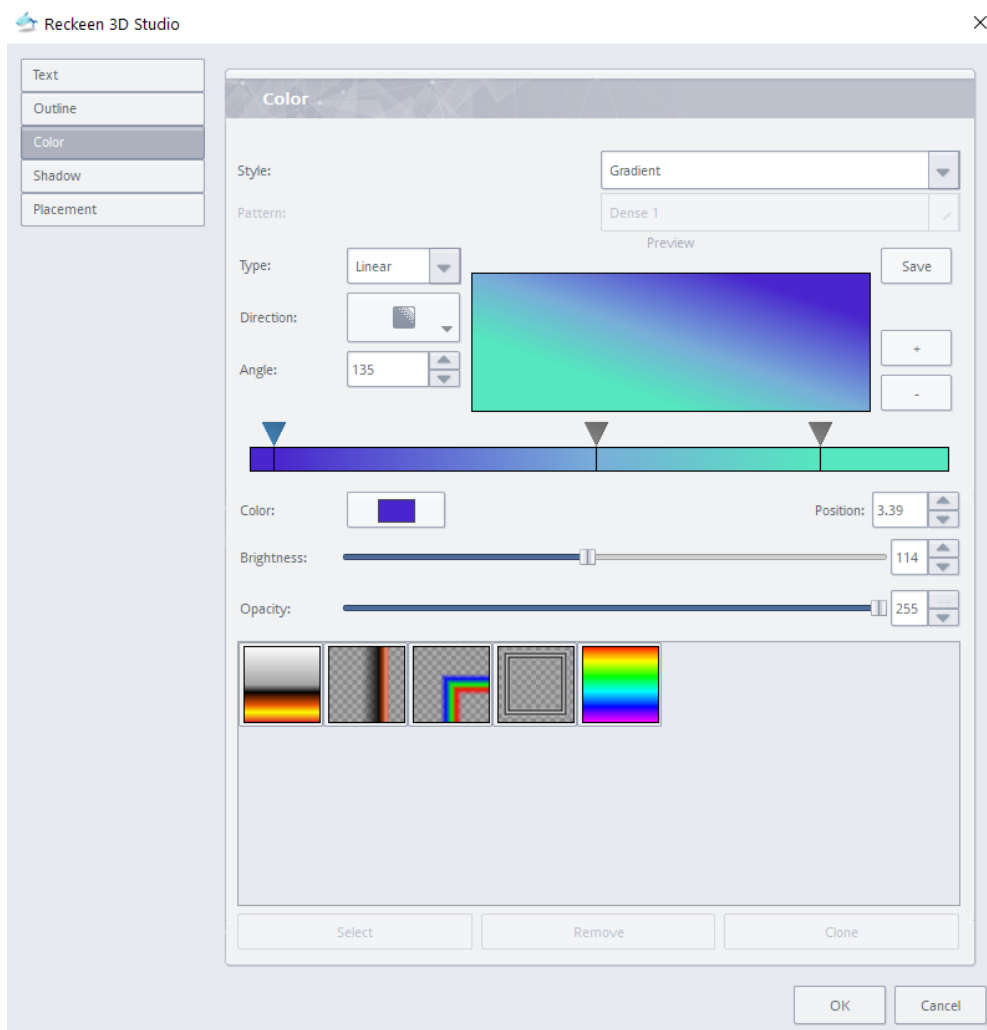
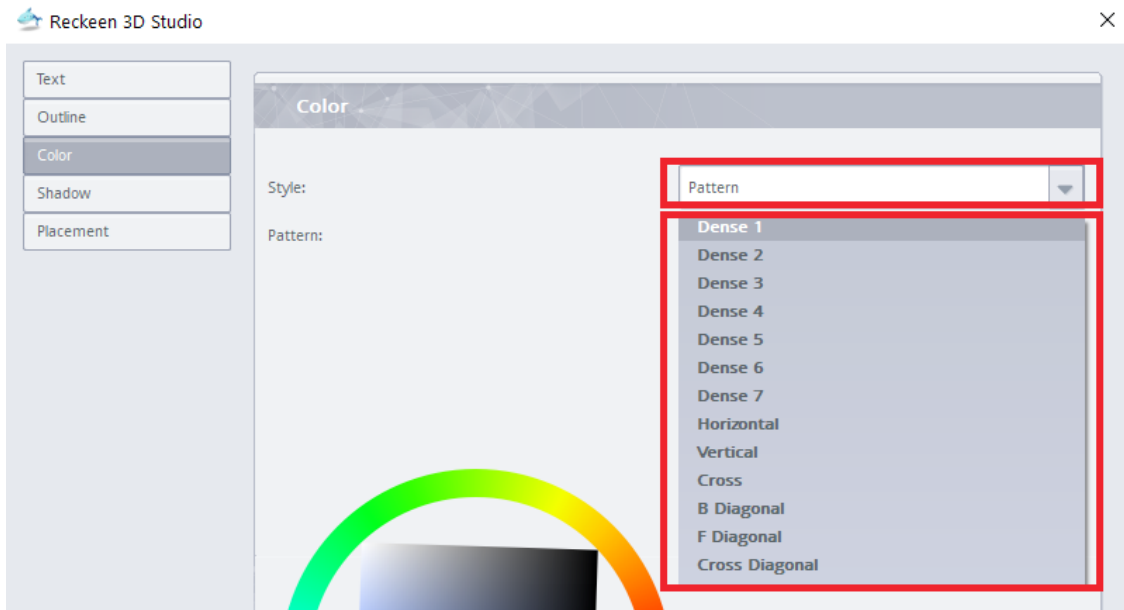
After opening the drop-down list of [Style options](#), you have the following possibilities: (image below)



- [No brush](#) - the text will be filled with transparency, only the text's contour will be visible on screen.

- **Solid** - transfers you to the color wheel to adjust the text's color, it is done in the same way as described above, when adjusting the text's contour color – Outline (see the image below - arrows indicate the possibility to operate using the cursor)
- **Pattern** - after opening the drop-down list, select the interesting filling pattern. After selecting the pattern, you can choose the color with the color wheel. See the image on the next page.
- **Gradient** - when you choose a Gradient filling style, a window appears, as shown on next page.





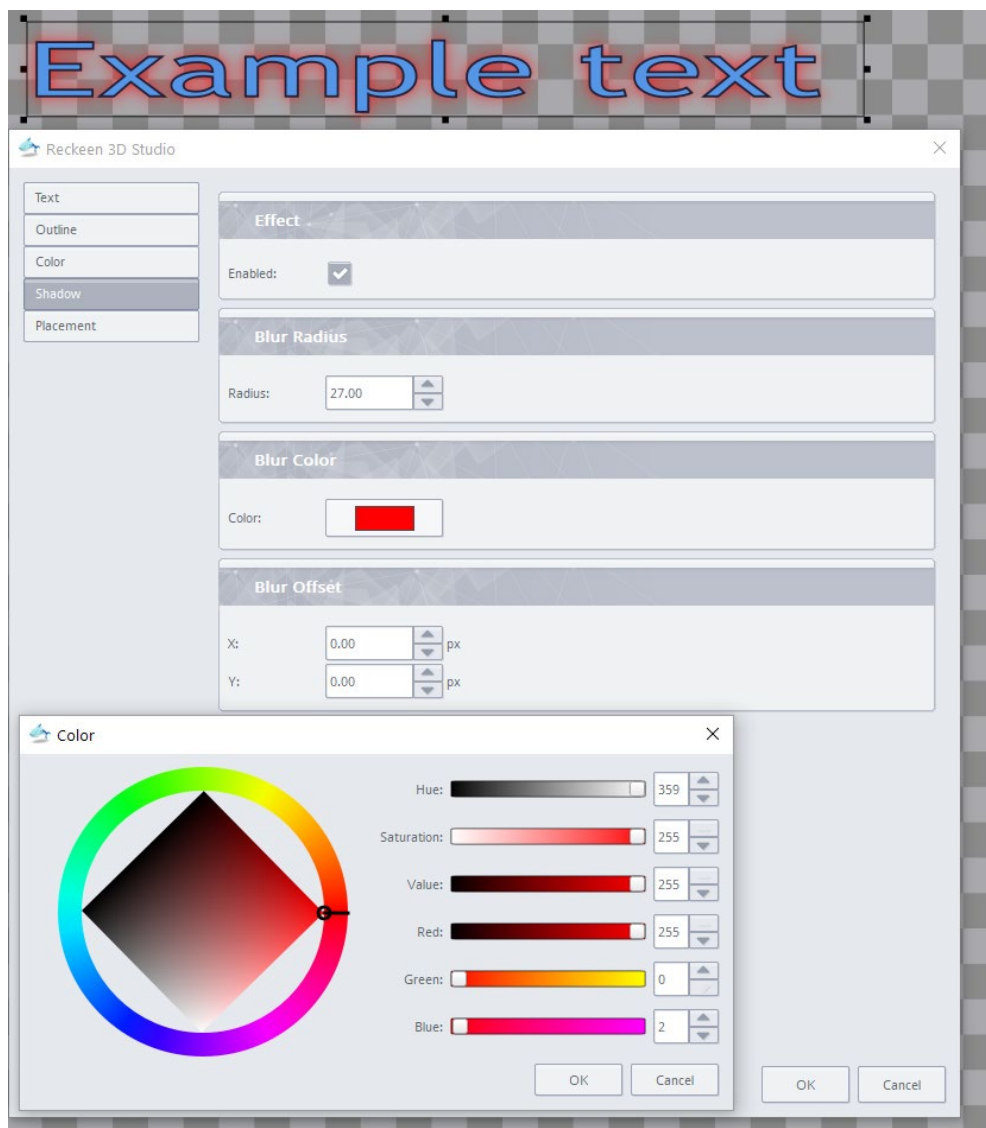
In the case of [Gradient](#), the texts' filling will be of a gradient type selected at the bottom of the window.

Highlight it with a cursor and click on the select icon.

In the [Preview](#) window you can see how the gradient will be applied to your text. You can change the proportions of selected areas of your gradient with triangular markers. The markers are positioned at the colors' transitions. The color set with a specific marker will be visible in the [Color](#) preview window, when you select the marker with a cursor.

SHADOW FUNCTION

With Shadow function you can design a shadow surrounding the text, its [color](#), [radius](#) and [offset](#). See the image below.

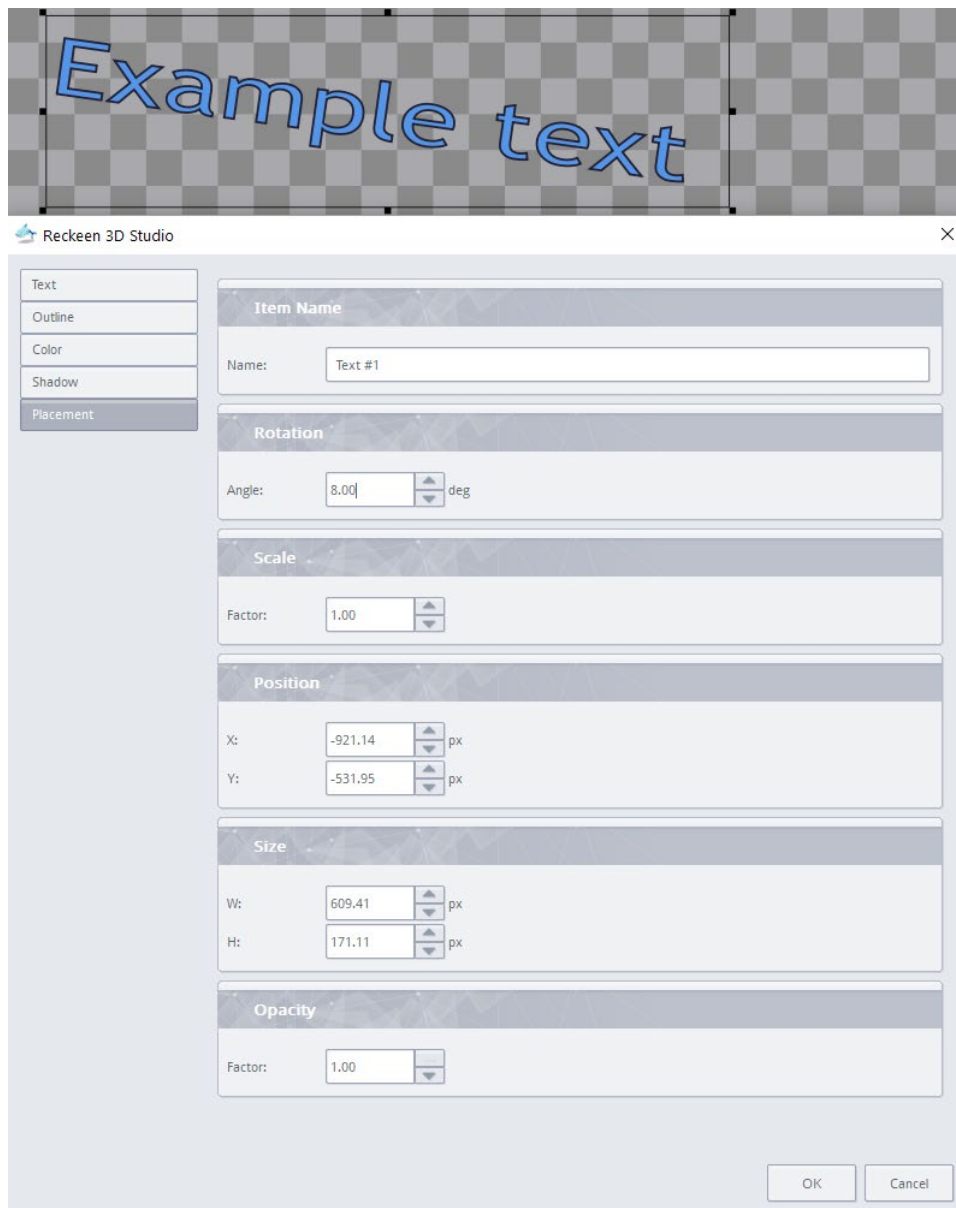


When you [enable](#) the [Effect](#) field, you can set the [Blur Radius](#), that is shadow's range around the text's contour.

- [Blur Offset](#) - allows you to offset the shadow in relation to the text on the screen.
- [Blur Color](#) - when you click [the color preview icon](#), the color window, as described above, will appear and you will be able to set the desired color of the shadow there.

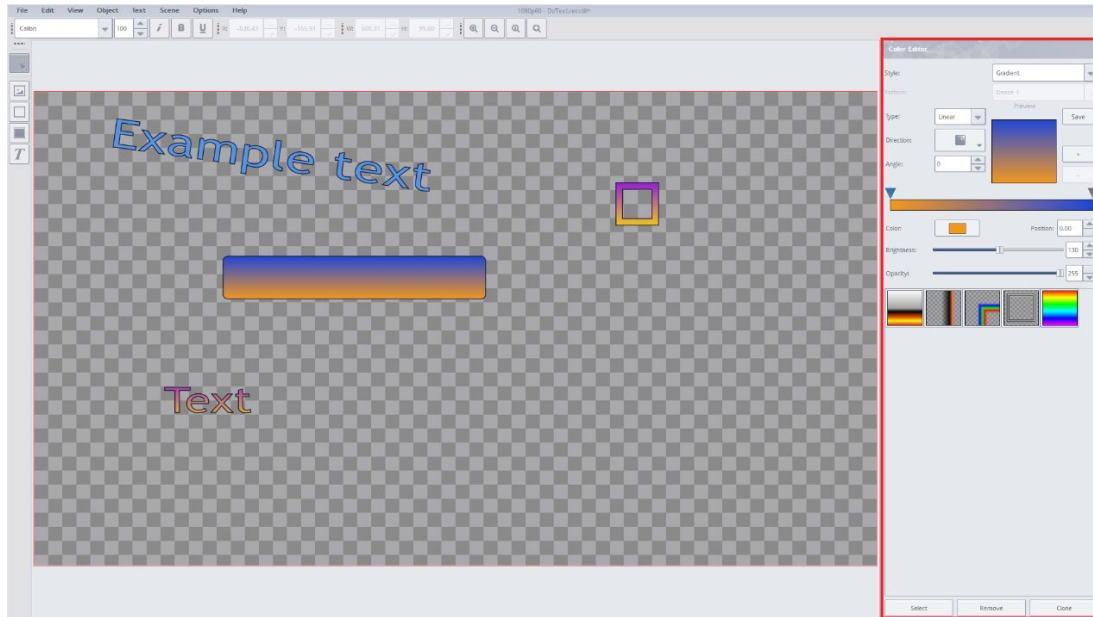
POSITIONING FUNCTION

In the [Positioning function](#) window, there are several options that enable changing the [text's size](#), its [rotation](#), changing its [scale](#) and [setting opacity](#). See the image below.



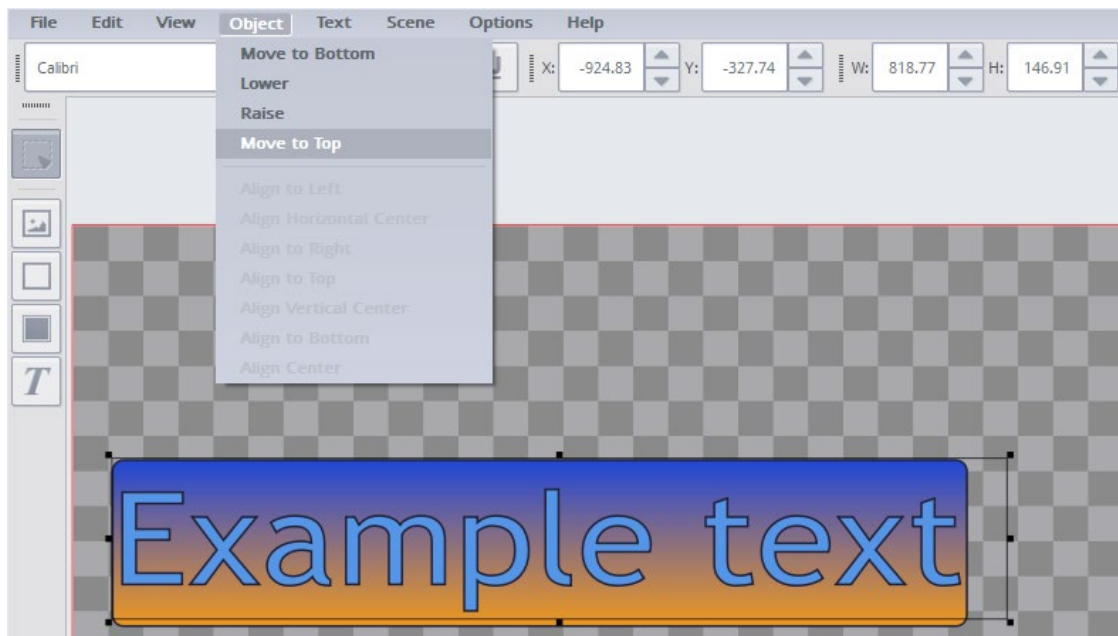
MENU BAR – VIEW

The View option allows you to enable showing the column of [color editor](#) or [contour editor view](#) at right side of the screen. See the image below - as indicated with a [red line](#).



MENU BAR – OBJECT

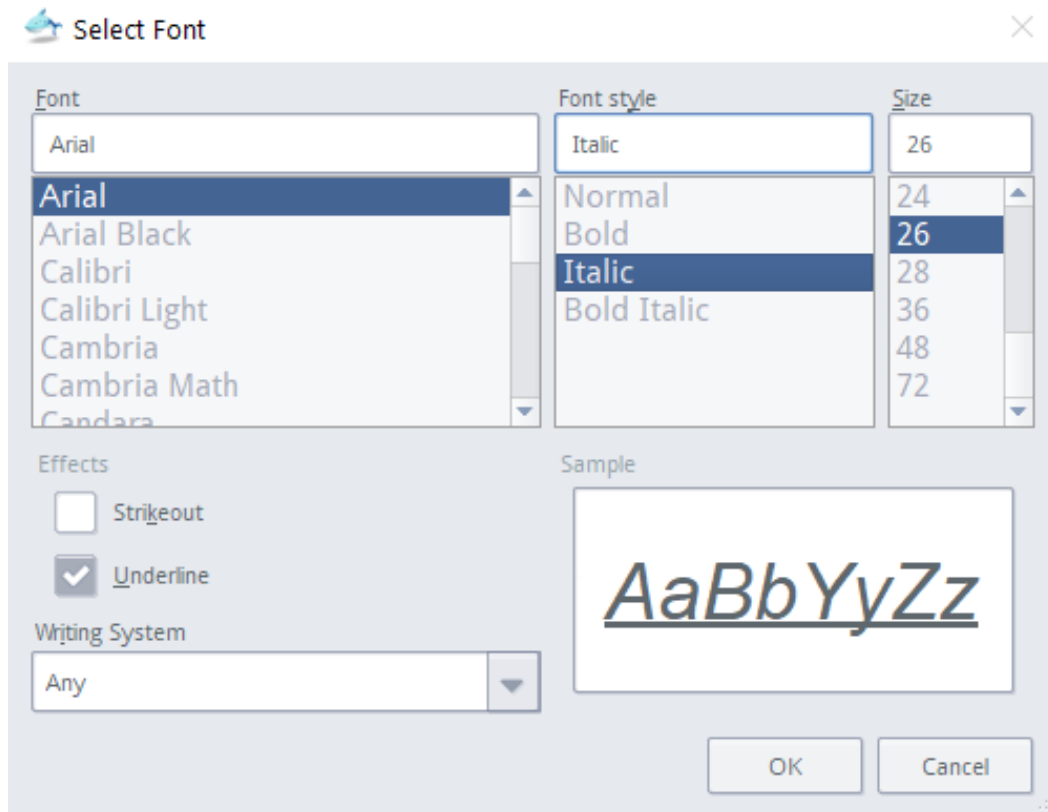
The menu option Object allows you to determine the order in which objects are visible, in case they overlap.



For example, if you want to put a caption on a [colored bar \(rectangle\)](#), you have to move the text to the [top](#), otherwise it will not be visible, as the [bar](#) will cover the text.

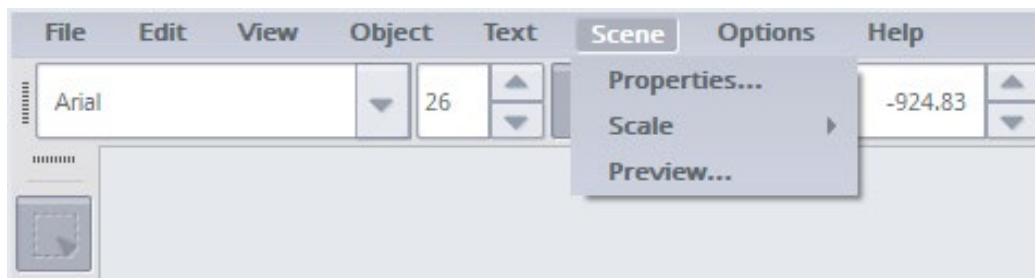
MENU BAR – TEXT

In this window, you can set all the parameters of the font being used, such as [Font type](#) and [Size](#), [Font Style](#) (Demi Bold, Bold, Demi Bold Italic and others), [Effects](#) ([Strikeout](#), [Underline](#)) and you can also select the [Writing System](#). The changes will be visible in the [Sample](#) preview window in the lower right corner.

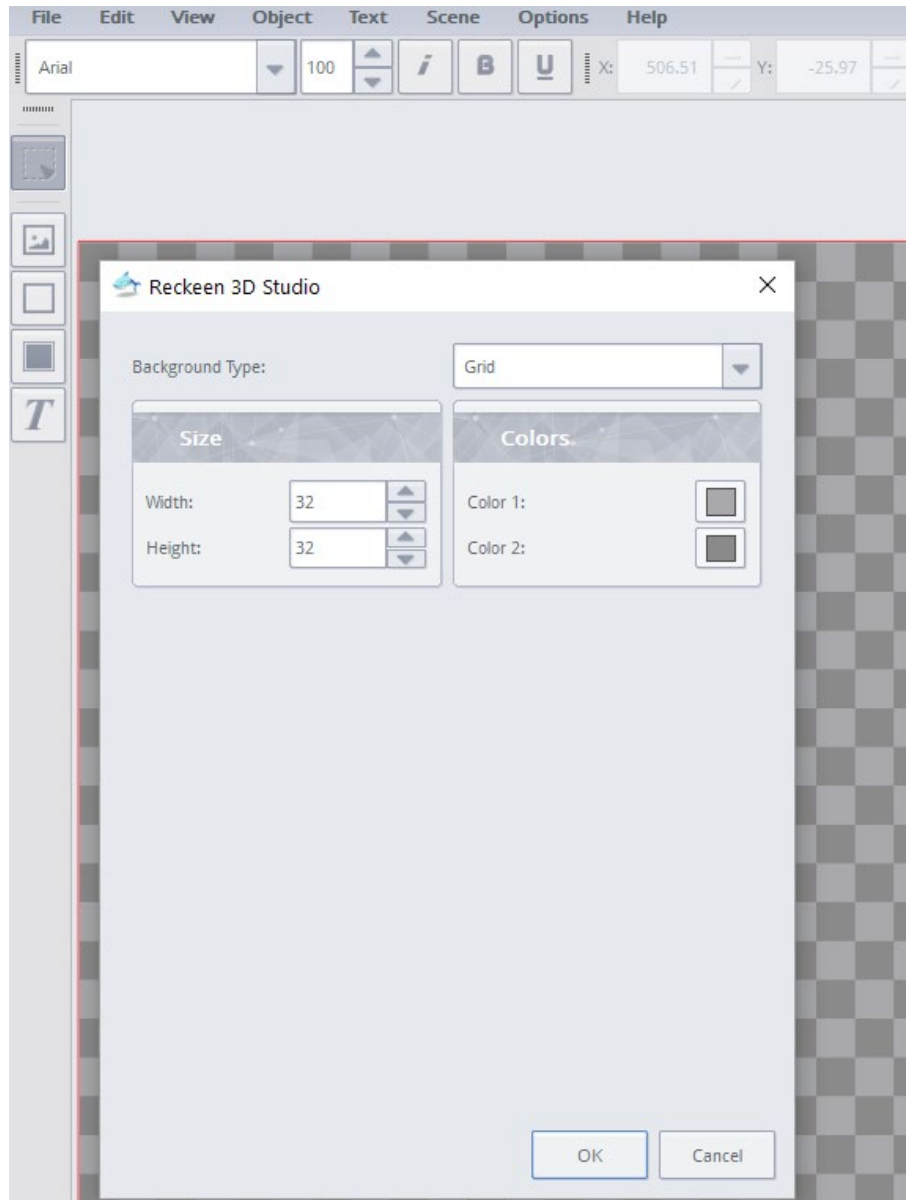


MENU BAR – SCENE

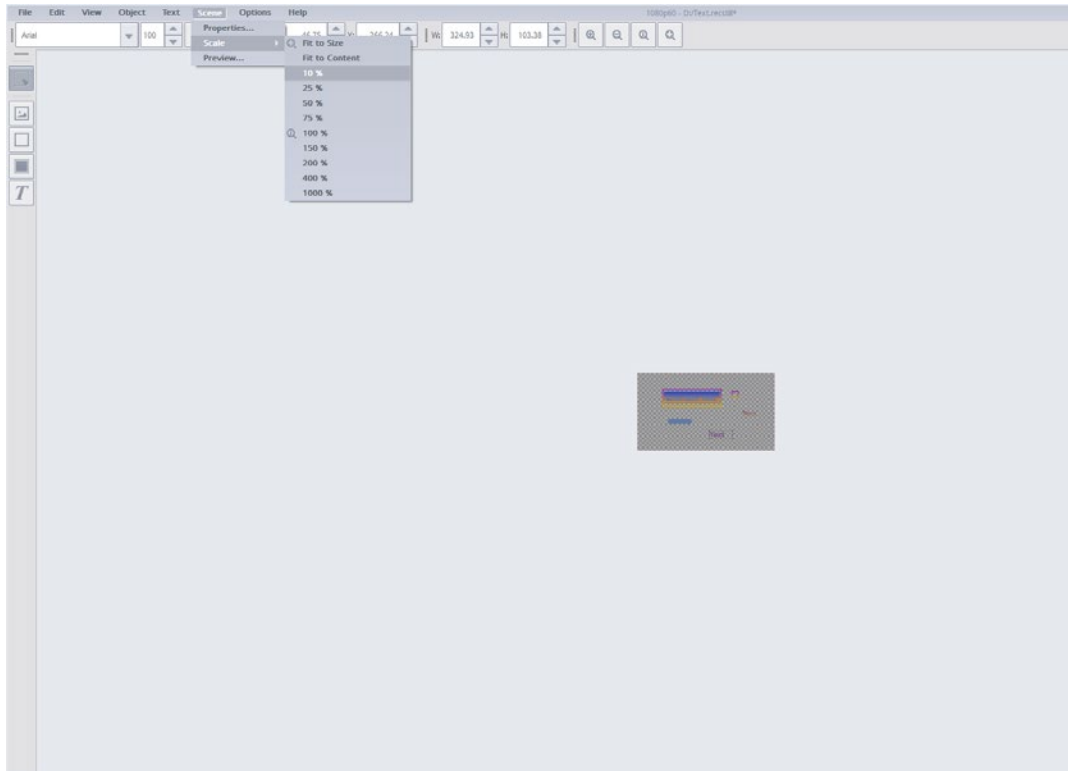
- The Scene Menu option has three sub-options: [Properties](#), [Scale](#) and [Preview](#).



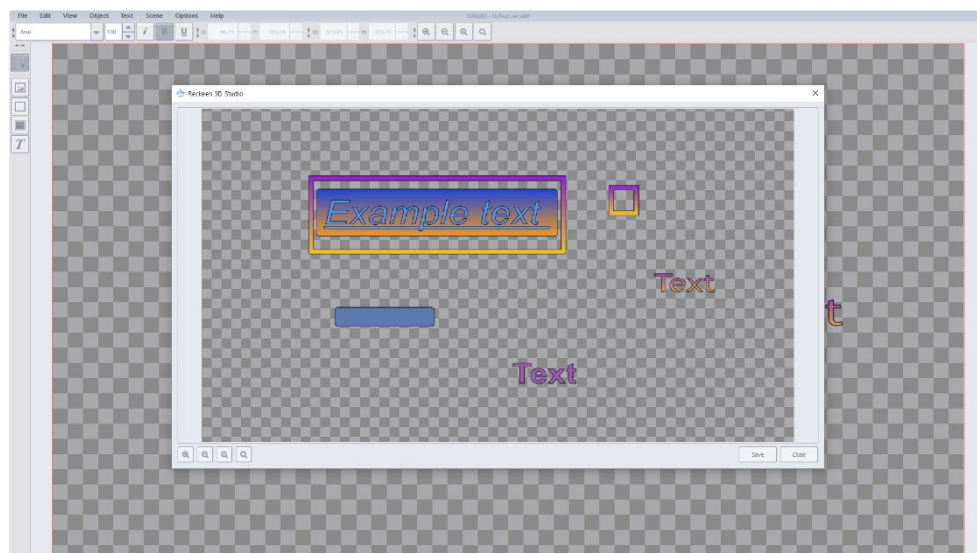
- [Properties](#) - this option allows you to change the parameters of the [scene's background \(Grid\)](#). You can change the applied [grid's size](#), as well as the two colors of chessboard squares. See the image below.



- **Scale** - this option allows you to set the **background's scale**. You can set the scale ranging from the lowest value of **10%** to the highest at **1,000%**. The image below shows the scale of **10%**.



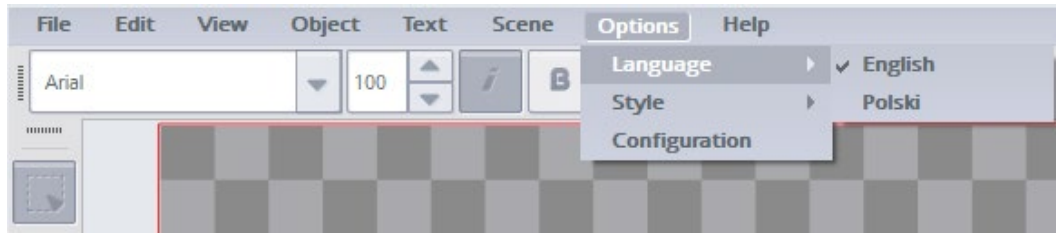
- **Preview** - this option enables the preview of an entire screen during the detailed editing. This way you can check the layout of all the elements. See the image below.



MENU BAR – CONFIGURATION

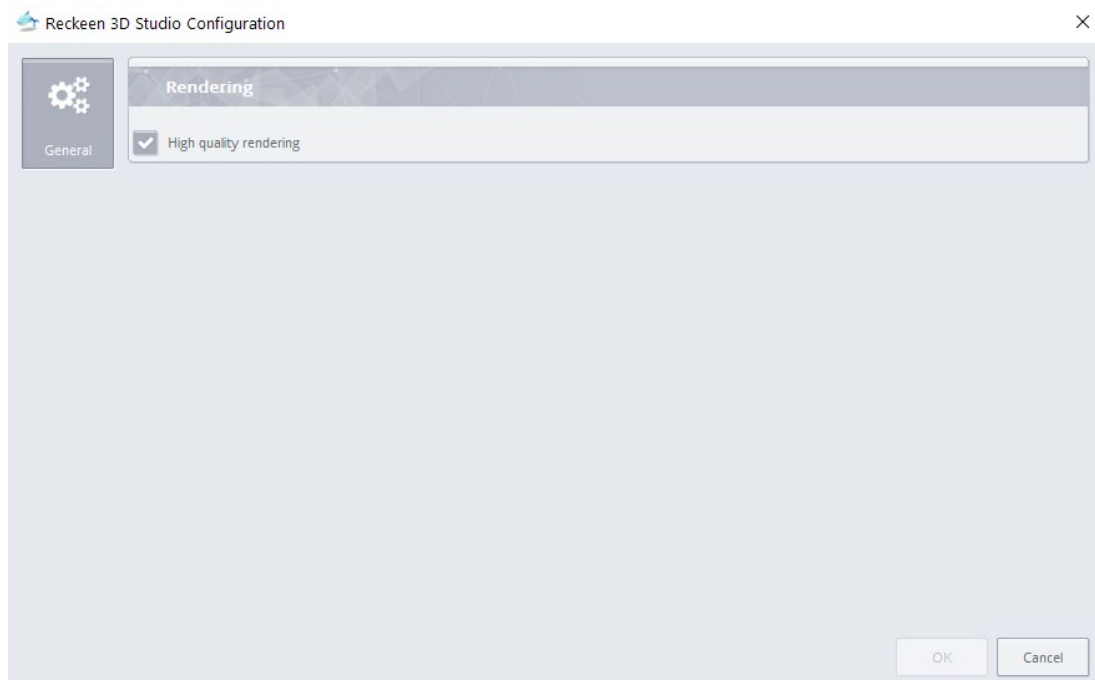
The Configuration option has two sub-options: **Language** and **Configuration**.

The **Language** sub-the option allows you to change the language of the **Still Editor** program. See the image below.



The [General Configuration](#) sub-option allows you to [enable/disable](#) the rendering. By default, the rendering functions are enabled. This allows you to [create objects, like texts](#), in high resolution (quality).

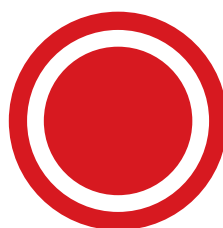
Disabling the rendering option allows you to increase the speed of editing the texts in [Still Editor](#), but at the expense of their quality.



MENU BAR – HELP

Here, you can scan the [QR code](#) to open the [Reckeen website](#). When you click on the [About](#) the program icon, the End-User License Agreement ([EULA](#)) appears in the window, along with a number of the current software version and the card's serial number at the bottom.

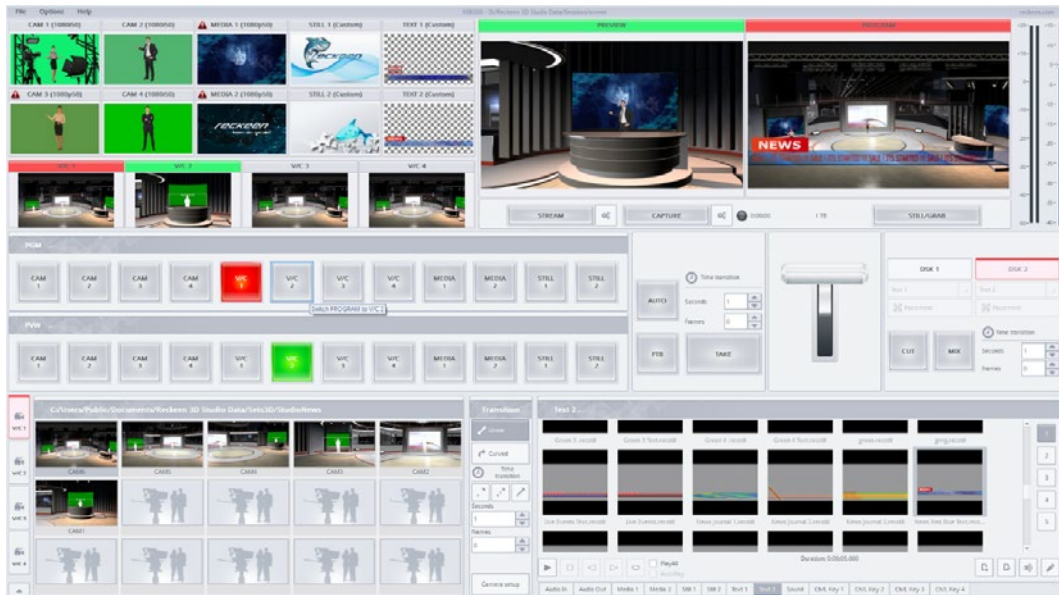
7



3D Production module
screen

After clicking on the **3D Production** icon on the start screen, the main module of the system appears on the screen. It's a kind of an executive center, where most of the Reckeen 3D system production functions are activated from.

The screen of 3D Production for Reckeen 3D Studio (White Style)



The production screen area can be divided into five main areas, as shown below (Black Style):

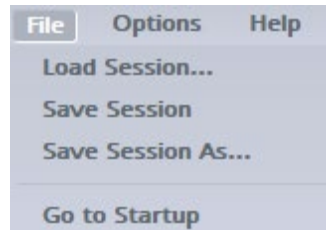
1. Toolbar
2. Multiview Panel (previews panel)
3. Vision Mixer (production switcher)
4. Virtual 3D studio Configuration Panel
5. Media trays



TOOLBAR

There are three options on the toolbar: [File](#), [Options](#) and [Help](#)

Options – File



- [File – Load Session . . .](#) - opens a session file with a previously saved production.
- [File – Save Session](#) - saves a current production file.
- [File – Save Session As . . .](#) - saves a current production in a file under a different name.
- [File – Go to Startup](#) - takes you to the [start screen](#)

Options – Layout

In this option, you can choose the number of screens to display and their arrangement on the monitors.



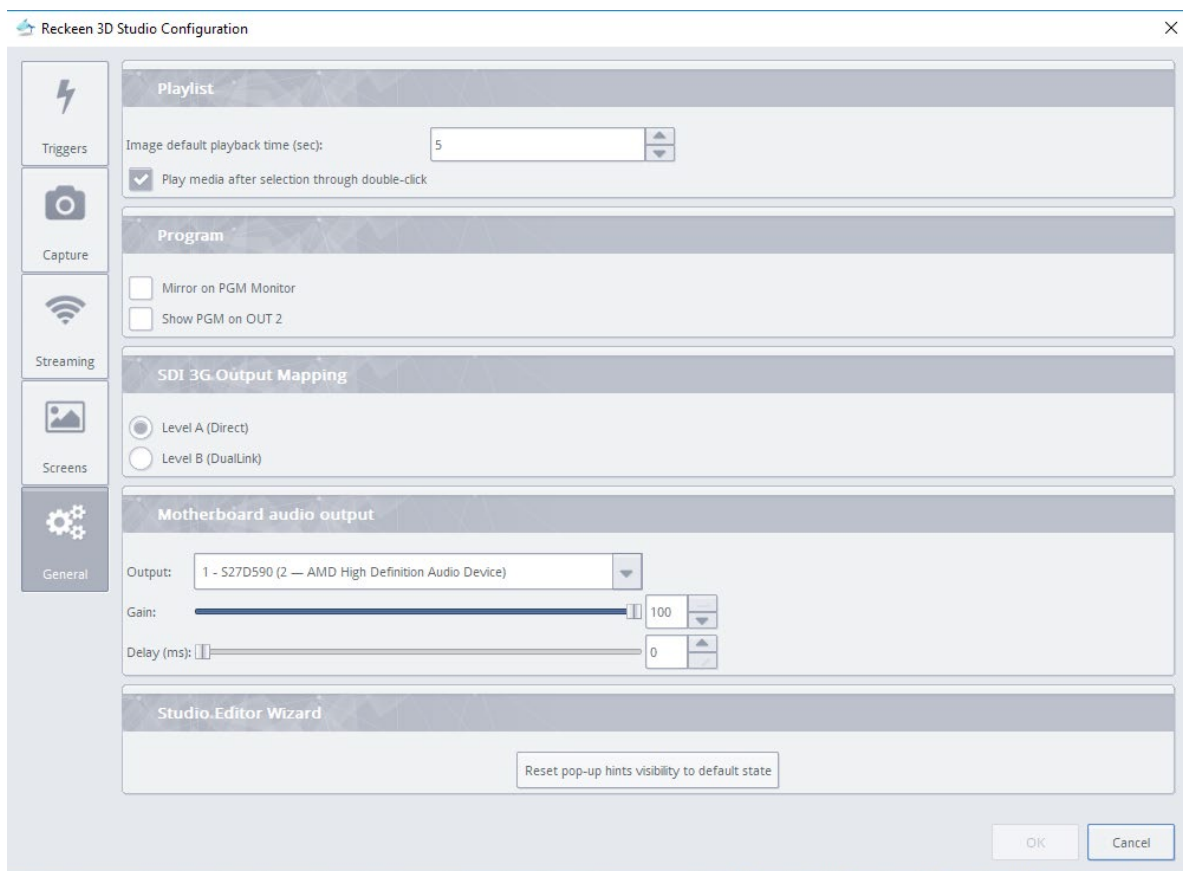
Options - Language

Here, you can set the system language by selecting it

Options – Style

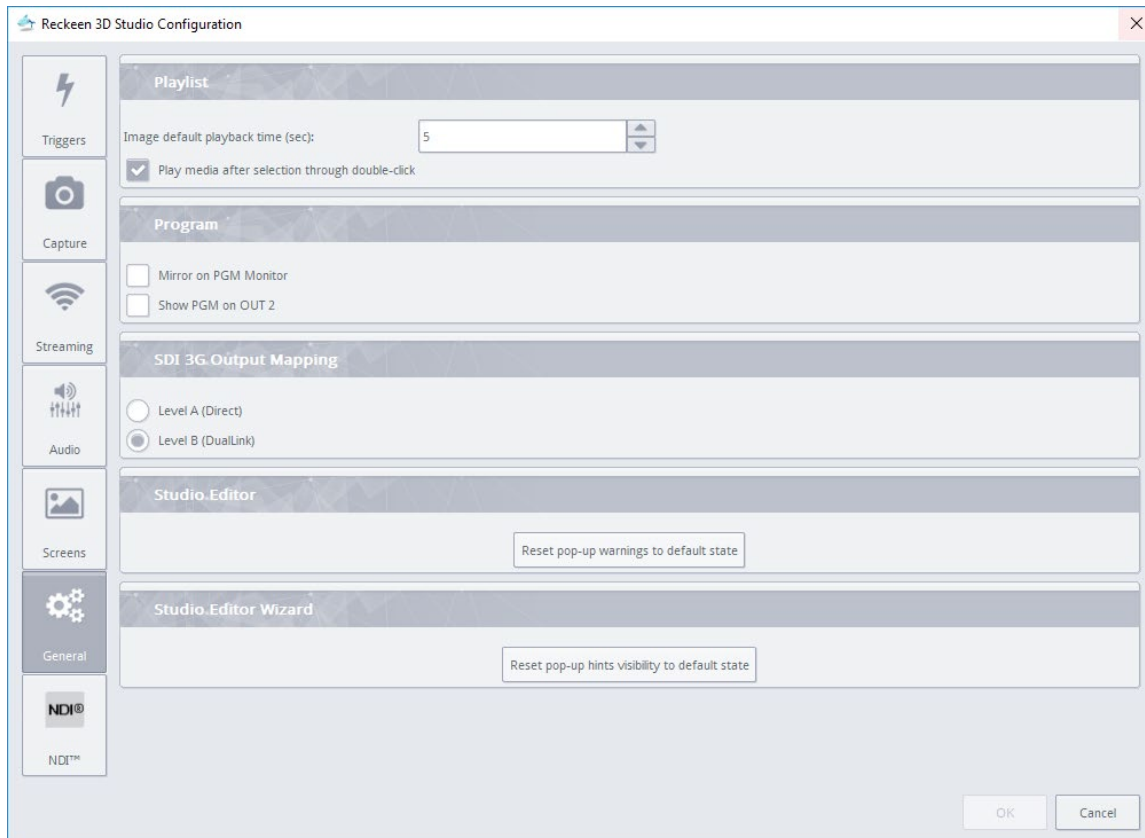
Here, you can choose the color of [Style skin](#) : [White](#) or [Black](#)

Options – Configuration



When you select the [Configuration](#) option, a window opens with tabs in its left side containing the available categories of settings:

- [Triggers](#) - settings of [Triggers](#) for the physical [PC](#) keyboard or [VKEY-100](#) control panel. More in the section: [Control Panel / external keyboard](#)
- [Capture](#) – quality settings for recording to a file on your hard drive. More in the section: [Capture function](#)
- [Streaming](#) - streaming settings. More in the section: [Video program Streaming function](#).
- [Audio](#) – audio settings . More in the section: [Configuration Window: Audio Tab](#)
- [Screens](#) - assigning production windows to monitor screen. More in the section: [Setting the displayed content on the monitors](#).
- [General](#) – general system options are described below. Configuration Window see picture below.
- [NDI](#) - replace system inputs as NDI inputs



Configuration Window: General Playlist window:

- **Image default Playback time** - default playback time for still images in seconds.
- **Play media** after selection through double click, described in the section: [Preparing media for broadcast](#)

Program window:

- **Mirror on PGM monitor** - enabling this feature allows you to view the mirror image on the Preview monitor, giving you the possibility to use it as a preview monitor for the presenter. More in the section: [Setting the displayed content on the monitors](#).
- **Show PGM on OUT 2** - in Reckeen 3D Studio as a default, a signal corresponding to **PGM** is set on the first card output and a signal from **PVW** is set on the second card output. After selecting Show **PGM** on **OUT 2** function, you get the **PGM** image also on the second output.

SDI 3G Output Mapping window:

- When the Reckeen 3D Studio system operates in **3G format (1080p)**, you have two possibilities of **SDI output** operating modes: **Level A (Direct)**, **Level B (Dual Link)**. If you want to convert **SDI** signal to **HDMI**, or your monitor requires a suitable signal mode (**Direct** or **Dual Link**), you must select an appropriate option.

Studio Editor:

- [Reset pop-up](#) hints visibility to default state - described in the section about [Performance](#)

Studio Editor Wizard:

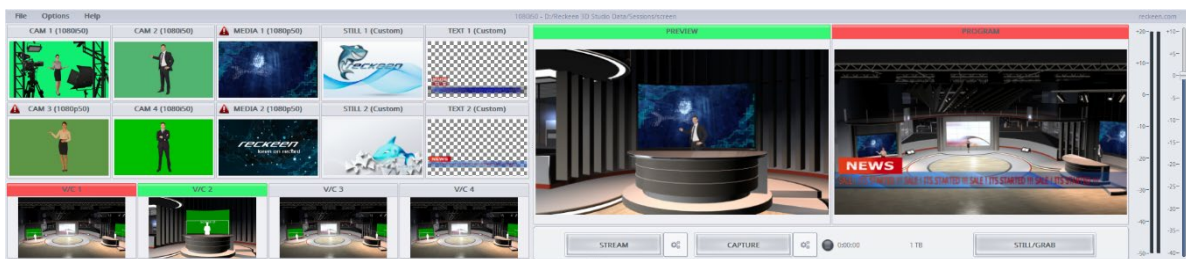
- [Reset pop-up](#) hints visibility to default state - described in the section about [Wizard](#)

MULTIVIEW PANEL

In the Multiview area, in the windows at the top left of the screen, you can display image from cameras or every [video signal source](#) and other [multimedia files](#). There are two preview windows on the right side of the production screen:

PREVIEW (caption on the [green](#) bar) and **PROGRAM** (caption on the [red](#) bar)

- **PREVIEW** - presentation of an item chosen to broadcast next
- **PROGRAM** - presentation of a currently broadcasting signal (system output)
[Multiview](#) view on the production screen for Reckeen 3D Studio, as shown below.



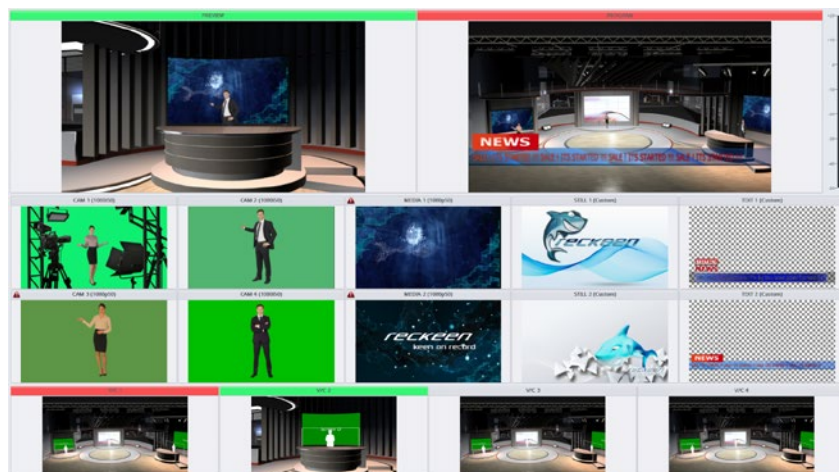
Description of Multiview view elements

Cam 1	Preview window of a camera 1
Cam 2	Preview window of a camera 2
Cam 3	Preview window of a camera 3
Cam 4	Preview window of a camera 4
Media 1	Preview window of a video file 1 from the hard drive
Media 2	Preview window of a video file 2 from the hard drive
Still 1	Preview window of a still image 1 from the hard drive
Still 2	Preview window of a still image 2 from the hard drive

Text 1	Preview window of a text panel 1 from the hard drive
Text 2	Preview window of a text panel 2 from the hard drive
Preview	Preview window of a program prepared for broadcast
Program	Window with a preview of program's current production
Stream	Icon enabling online streaming of a program
Capture	Icon enabling recording of a program to the hard drive
Still/grab	Icon enabling saving a single PROGRAM image frame to the hard drive
Volume & Set volume	Two vertical bars showing Audio output signal level and a slider controlling the Audio output signal level
V/C1	Preview window of a Virtual Camera V/C 1
V/C2	Preview window of a Virtual Camera V/C 2
V/C3	Preview window of a Virtual Camera V/C 3
V/C4	Preview window of a Virtual Camera V/C 4

Multiview view can be set on a separate monitor in order to facilitate the operator's work. See: [Additional monitors support](#).

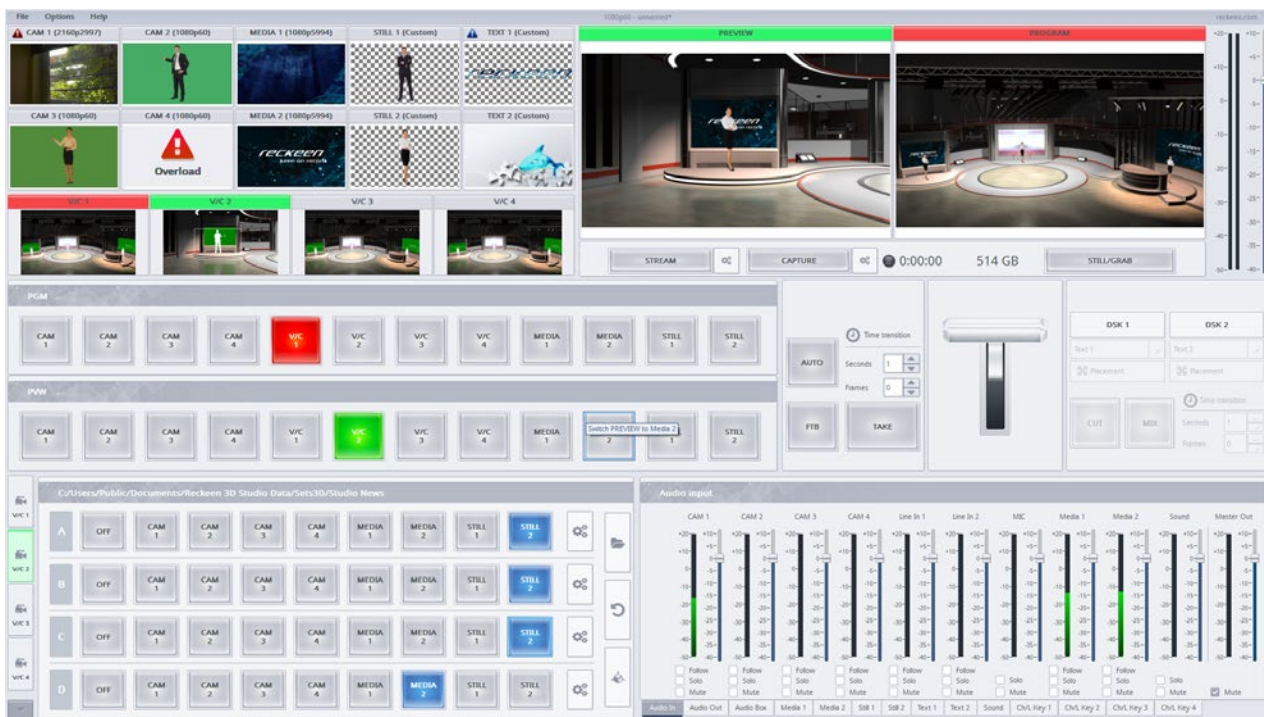
Multiview view on a separate monitor for the Reckeen 3D Studio system.



OVERLOAD

Up to 4 signal sources in the FULL HD format, i.e. 1080p60, can be connected to the Reckeen system's input card.

In the case of a system with SDI card, one of the inputs supports 4K format with 2160p30 resolution, which is equivalent to the need to process twice as much data as with 1080p60. If you connect such a signal to the system, you can connect 2 additional signal sources in FULL HD format to two other sockets. In the case of connecting another source to the card's input, an "Overload" graphics will appear on the display. Such a signal source will not be supported in the system.



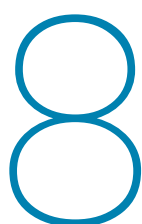
Warning !!!

If OVERLOAD appears on the input preview, it is necessary to physically disconnect such source from the Reckeen system.

The maximum system throughput is checked each time a source cable is plugged in and a correct communication with the Reckeen system occurs. Priority is given to a source a signal of which is detected first. NDI inputs do not participate in the calculation of the physical inputs' allowed transfer and are governed by their own rules described in the NDI STANDARD section.

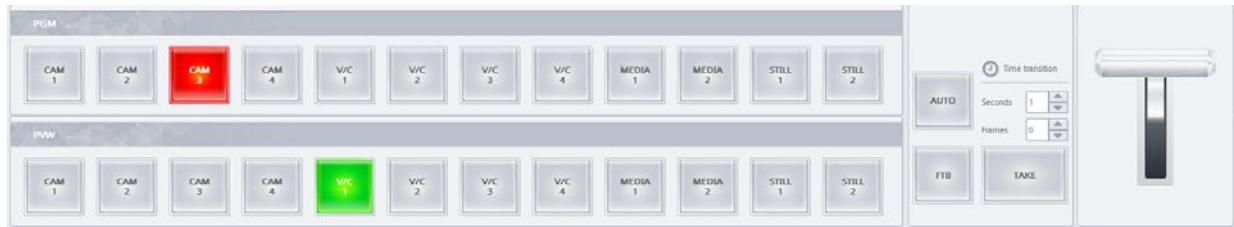
Possible system configurations:

- 4 inputs x1080p60
- 2 inputs x2160p30 (card type 4x HDMI)
- 1 input x 2160p30 and 2 inputs x1080p60

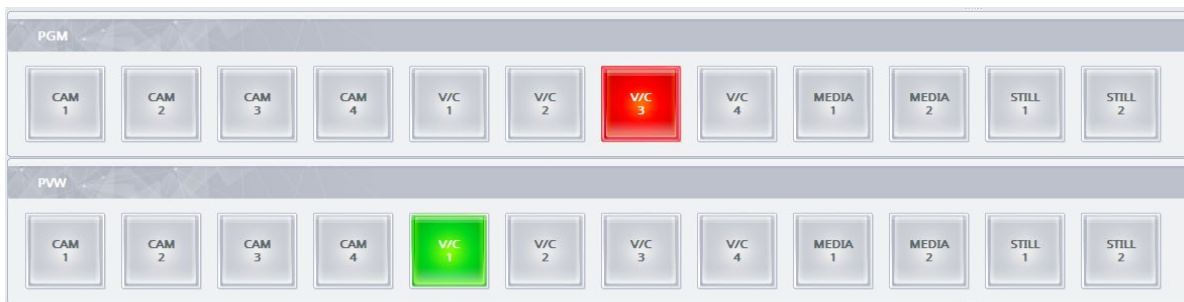


Vision Mixer – Production
switcher

An executive area - a Vision Mixer (production switcher), - occupies the middle part of [3D Production](#) module screen. The [mixer's panel](#) is composed of two rows of buttons with executive keys block on the right side of the screen. It is used to direct the chosen content on the air and to prepare the next materials for broadcast. See the image below.



[Mixer buttons](#) are located on [Program](#) and [Preview](#) lines. You can switch between different sources of signals on [PGM](#) and [PVW](#) by clicking the corresponding buttons. The image below.



The top line of buttons - [PGM](#) - indicates the image the source of which is sent directly on the air. The selected source button directed to be broadcast at the moment is highlighted in [red](#).

The bottom line of buttons - [PVW](#) - allows you to indicate which image source will be aired next. An active button is marked in [green](#). The chosen material is visible in the [PREVIEW](#) window.

12-inputs main mixer:

- [4 x CAM](#) - allows you to select an input source, to which a signal from a camera is usually directed. You can use [chroma](#) and [luma key](#) on the signals from this channel. You can also use a signal from an external source e.g. [PC](#), [camcorder](#), [video player](#) or another video source such as NDI input instead
- [4 x V/C](#) - allows you to select one of four [virtual cameras](#) (virtual cameramen).
- [2 x Media](#) - two [video](#) files from your hard drive
- [2 x Still](#) - two [graphic images](#) from your hard drive

After selecting and editing the sources for the broadcasted program, the next step concerns using the [function buttons](#): [online streaming](#), [transition effects](#), [inserting a logo](#) or an [animation](#) during the production process with the help of [DSK](#) and others. Descriptions of the individual functions are presented below.

PREVIEW AND PROGRAM WINDOWS – CHANGING THE SIGNALS



This block consists of several components, the most important of which is a Take button. Clicking it causes immediate switch between **PVW** and **PGM** signals. What was planned to be broadcast is broadcasted and the signal “removed” from the vision goes to **PVW** display. **FTB** (Fade To Black) button allows for a gradual transition of the broadcasted signal to black. This function is used for taking down the broadcasted image from the air and replacing it with black, for example in an emergency or at the end of a broadcast. Using this button cause a total quiet on the master audio output.

The same effect as with the **Take** button can be achieved by using the **Auto** button, with only difference being that the change of **PVW** and **PGM** signals does not occur at once, but smoothly, on a down-mix of both images and slow transition from one image to the other. You can set the time of this transition in seconds or in frames using the arrows located next the **Auto** button.

It is possible to control the **Auto** function directly from the production screen. You can operate the **T-Bar** slider displayed on the screen with a cursor. The same result can be achieved by using the **T-bar** handle on the **VKEY-100** control panel.

DOWNSTREAM KEY – DSK FUNCTION

On the right side of the **vision mixer (main switcher)** block is an area with **DSK functions**. The **Switcher** allows you to decide which source or which image from the inside of a **virtual studio V/C** is aired. However, no program can go without graphics and text panels. They are put into the broadcasted signal in the final step, on separate layers, in the form of overlays on the main signal. They are commonly referred to as **DSK (Downstream Key)**.

The Reckeen 3D Studio system allows you to place on the aired image up to two **DSK** signals at the same time. The source of such signal may be: **Media** (1 and 2), **Still image** (1 and 2), or **Text** (1 and 2). It can also be an image from a camera or laptop sent to **CAM** input. In order for the **DSK** function to operate correctly, the media sent to **DSK** must contain transparent areas. In this manner, they will be placed ‘above’ the main signal. Media without transparent areas used with **DSK** will completely cover the aired image with their content, which is not advisable (unless the program’s creator desired so).

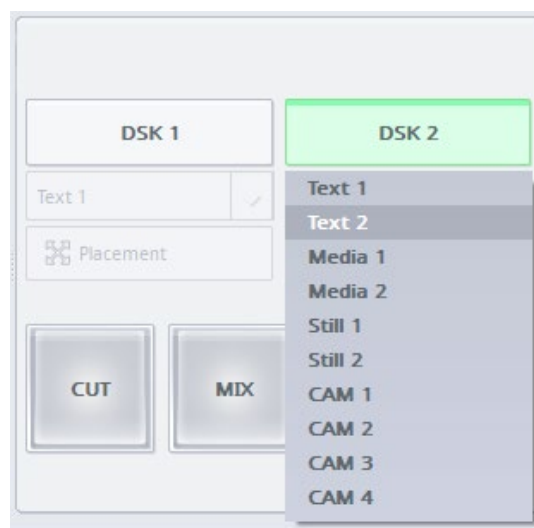
Usually, panels with captions, still graphics or short computer animations are used on **DSK** layers. For their preparation, video formats or graphic files with a definition of transparency (i.e. **alpha channel/alpha**) should be used. In the case where a signal from a camera is used as **DSK**, its use should be connected with keying. The Reckeen 3D Studio system is equipped with its own **text panels editor - Still Text**. With the editor, you can easily prepare subtitles to be used on **DSK layers**. An additional advantage of such created panels is the possibility of modifying their content from the broadcasting program level. Swapping the text content already on the air is also possible.

USING THE DSK FUNCTION

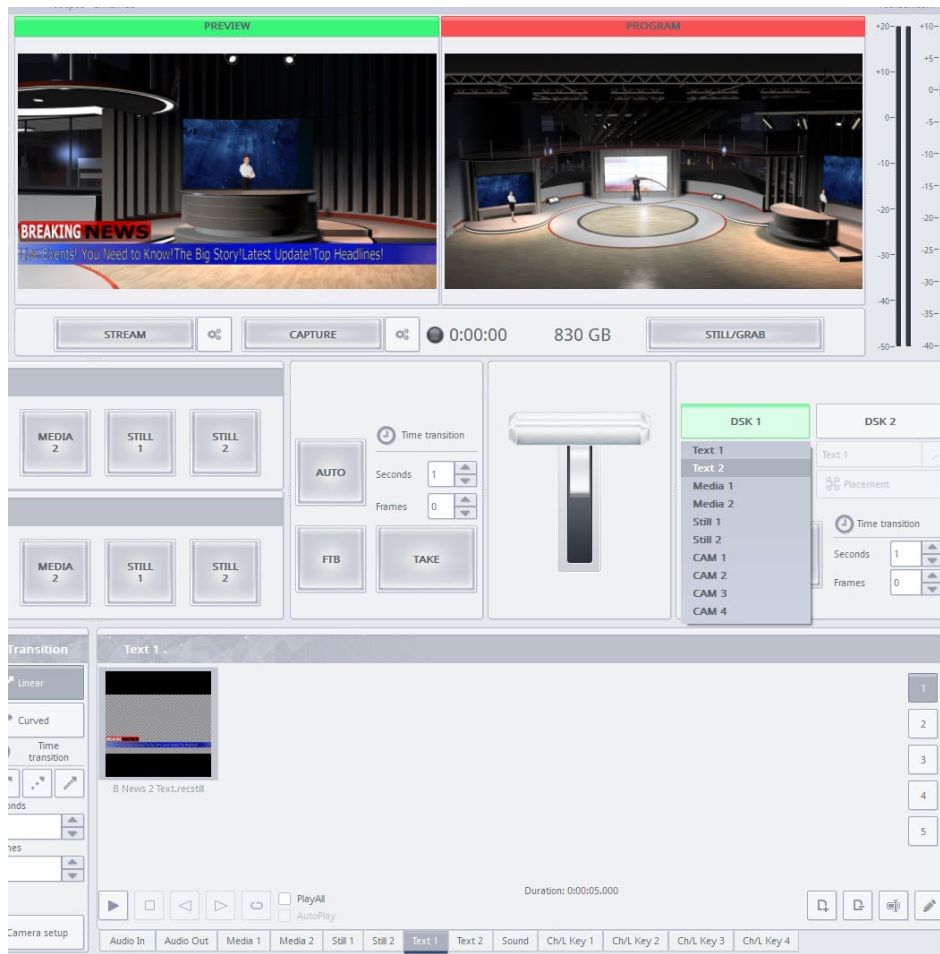
In order to use the **DSK**, you need to **enable** one of the buttons: **DSK1** or **DSK2** and select the source. Then, you have to adjust the location on the screen with **Placement** function. Entering on the air may occur smoothly (**MIX button**) or abruptly (**Cut button**). They operate independently of Take button on the **switcher**.



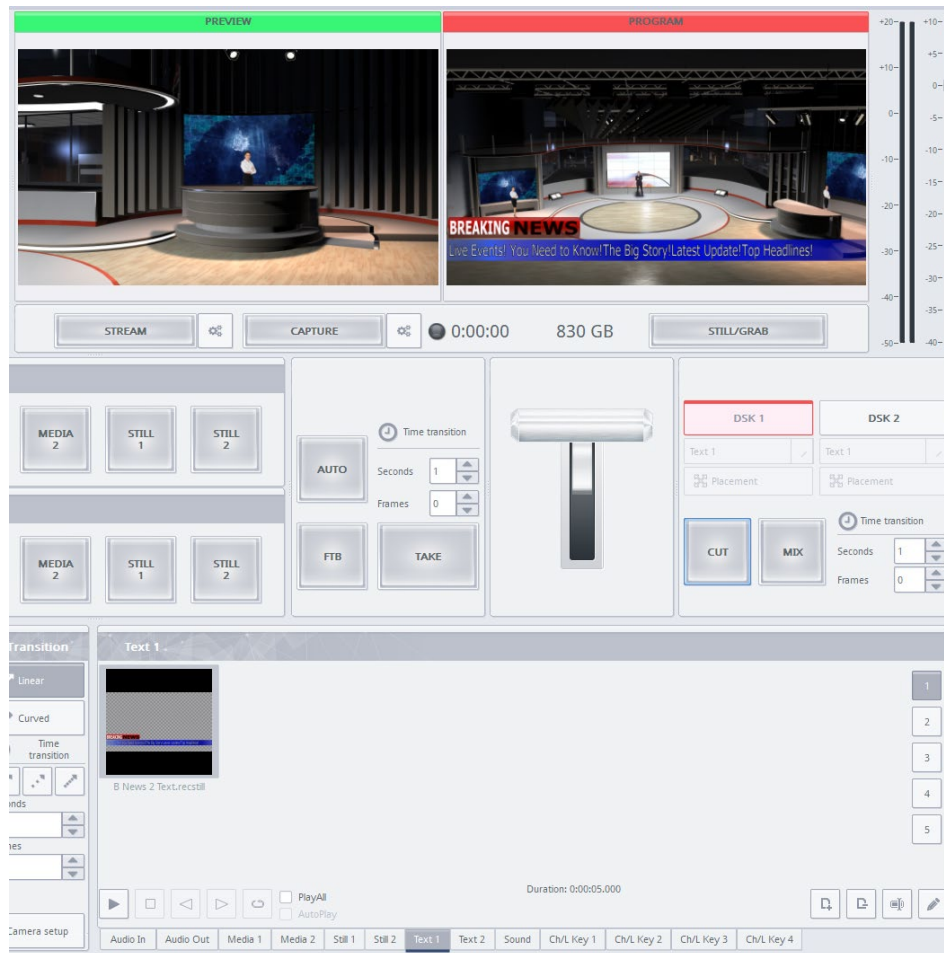
Example of the **DSK layer** usage: in order to use the **DSK**, one of the **DSK** buttons has to be **enabled**, then a source from a drop-down list has to be selected



- DSK button is highlighted in green,
- the caption is ready for broadcast,
- caption's preview is displayed in a PREVIEW window



- to change caption's size and position on the screen, you can optionally use Placement button (Note - changing the caption's position is not possible, if it is being already displayed on the air!) - description in the further part of the manual.
- the caption can enter on the air smoothly (MIX button) or abruptly (Cut)
- the operation of MIX and Cut buttons is independent of the Take button on the switcher,
- when the caption is visible on the air, the DSK button's color changes to red



- to remove the caption from the vision, use **MIX** or **Cut** button again,
- after removing the caption from the air, the **DSK** button's color is changed again to green and the caption appears in a **PREVIEW** window.

Both **DSK 1** and **DSK 2** layers are handled exactly in the same way. This enables using common **MIX** and **Cut** buttons to support **DSK 1** and **DSK 2** layers, which allows you to show both **DSK** layers on the air in a synchronous manner, and to switch the caption from **DSK 1** with the one from **DSK 2**. In this way, one caption will appear, while the second will be removed from the vision. To fully understand the principle of using the **DSK** function, you should perform several dry-runs with **Cut** and **MIX** buttons. A **PREVIEW** window, where the entered texts appear, should be watched simultaneously.

The **MIX** function's delay (length of transition run-time) can be set in seconds or in frames next to this function's button.

Click **Placement** button below the selected **DSK 1** or **DSK 2** button in order to configure position and size of the object inserted with **DSK**, a logo for instance. A window shown below will open then



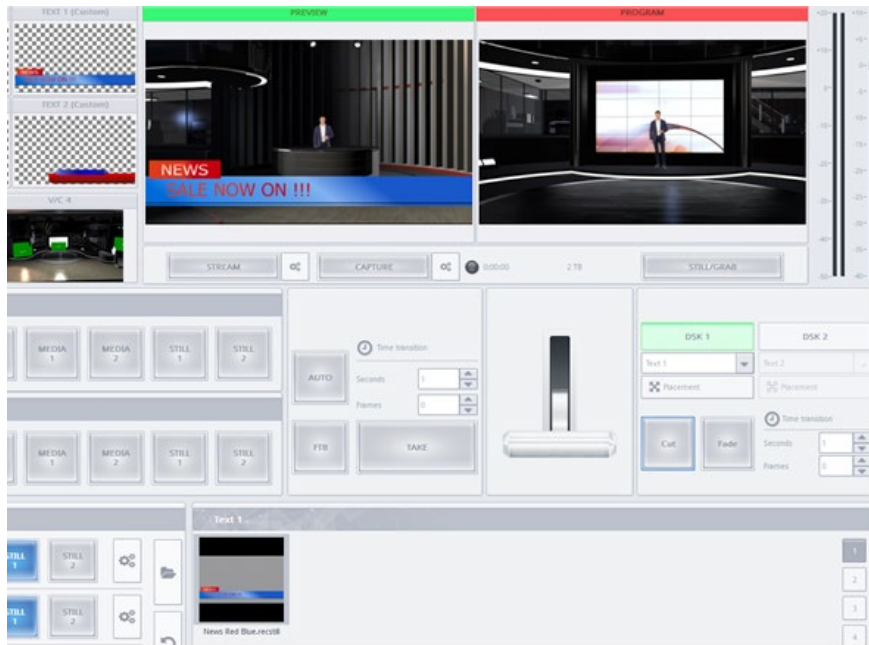
Joystick: used to change the object's positions on a screen through rough manipulation ([joystick hooks](#) and [steers the cursor](#)) or accurate one by pressing 4 directional arrows around the [joystick](#). On the other hand, a very accurate positioning is possible through pressing the [up/down](#) arrows displayed beside the fields with numerical values.

Central vertical controller : used to change the inserted [object's size](#), - you can move it with the cursor

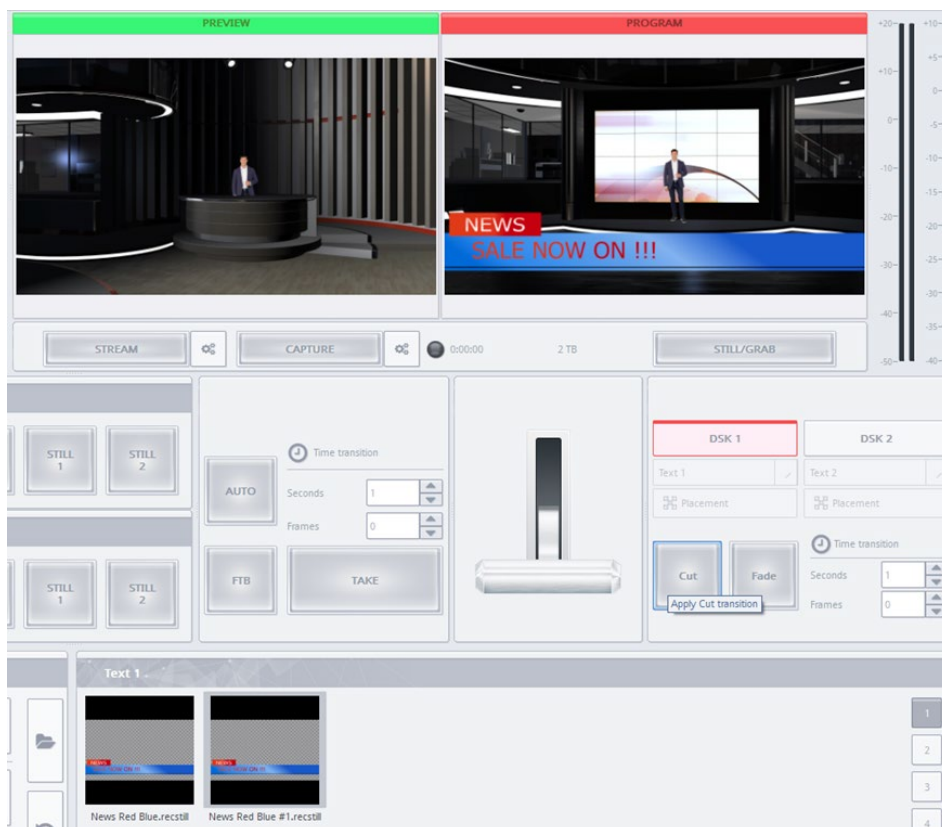
Right rotary knob: used to rotate the inserted object on the screen- you can move it with cursor.

DSK FUNCTION: SWAPPING THE TEXT CONTENT ALREADY ON THE AIR

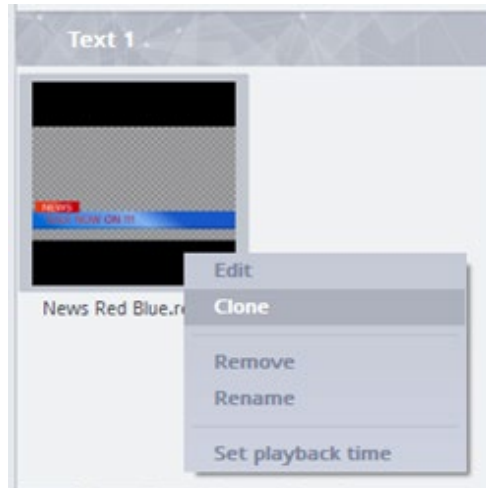
When you have a file with the news ticker previously prepared in the [STILL EDITOR](#), load it to the [Text 1](#) or the [Text 2](#) tray. Then, turn the [DSK](#) on by choosing the [Text](#) source from the drop-down list. The news ticker with the text will appear on the [Preview](#) screen. See the image below.



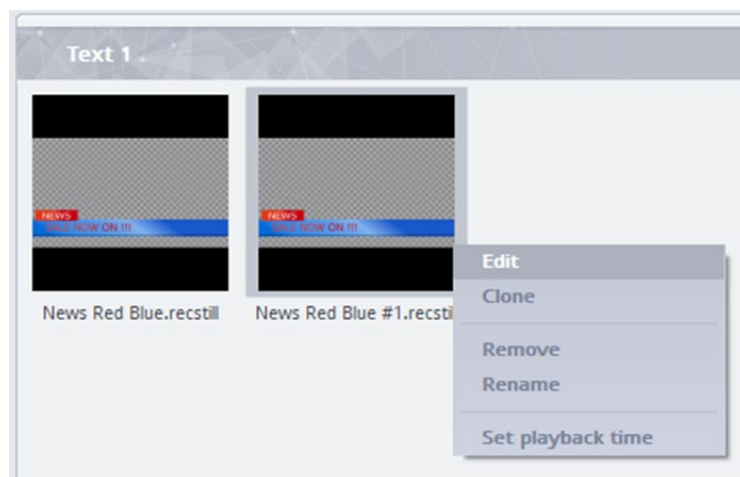
You can put your file on the air (**Program**) with **DSK** function. Image below.



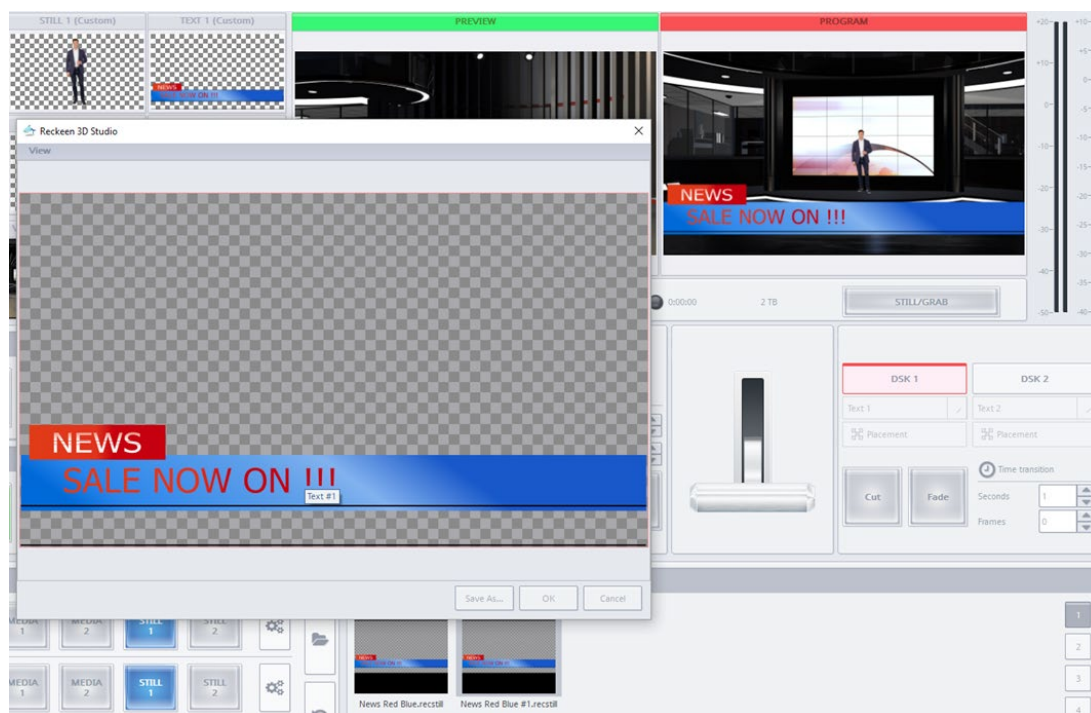
Any changes made to the *.recStill files are permanently saved overwriting the file, therefore you have to create a clone to avoid this situation. **Right-click** on the news ticker file's icon, and then select the **Clone** option from the drop-down list. For each new file clone, the filename copy with #1, #2, ... index is created. This way, you can avoid making unplanned changes to the original file.



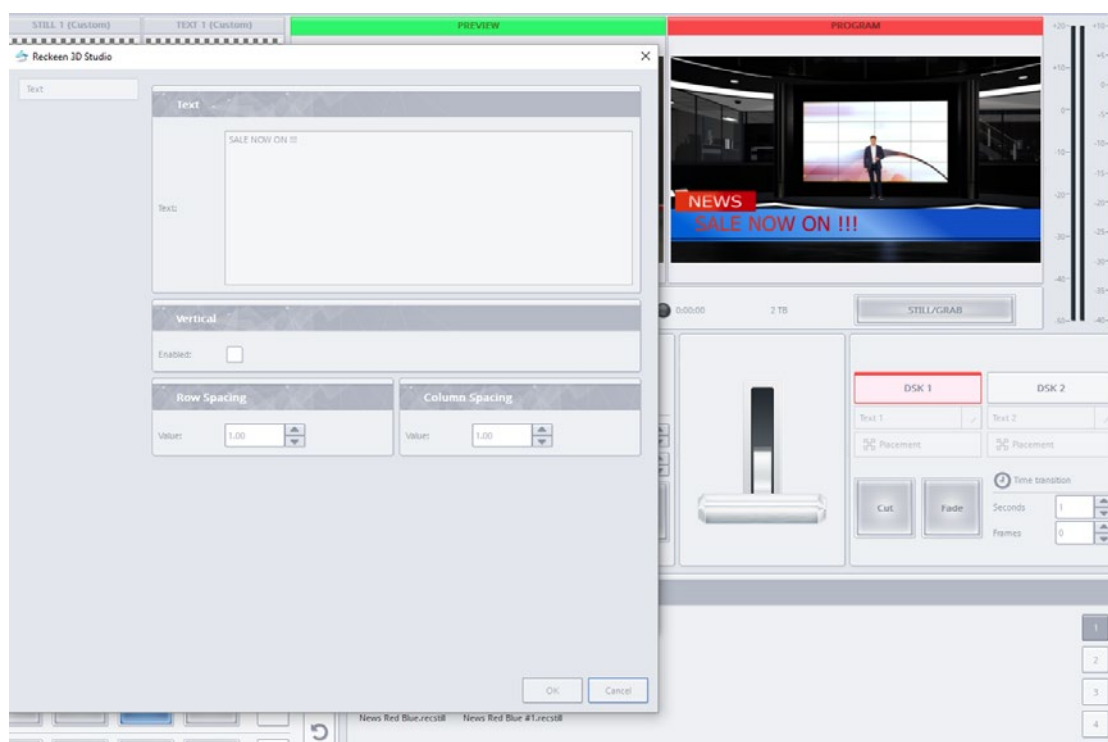
Let's change the text in [the clone #1](#) to show it on the air next. [Right-click](#) on the [cloned](#) file and select [Edit](#).



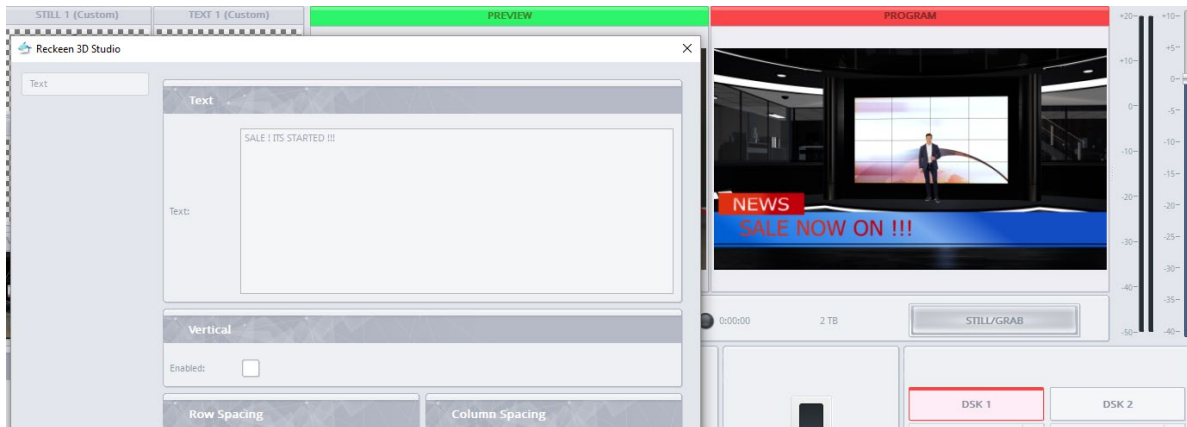
A window with a [preview](#) of the news ticker opens, as shown below. Now, move the cursor over the text you wish to [modify](#) and [double-click](#) the [right](#) mouse button.



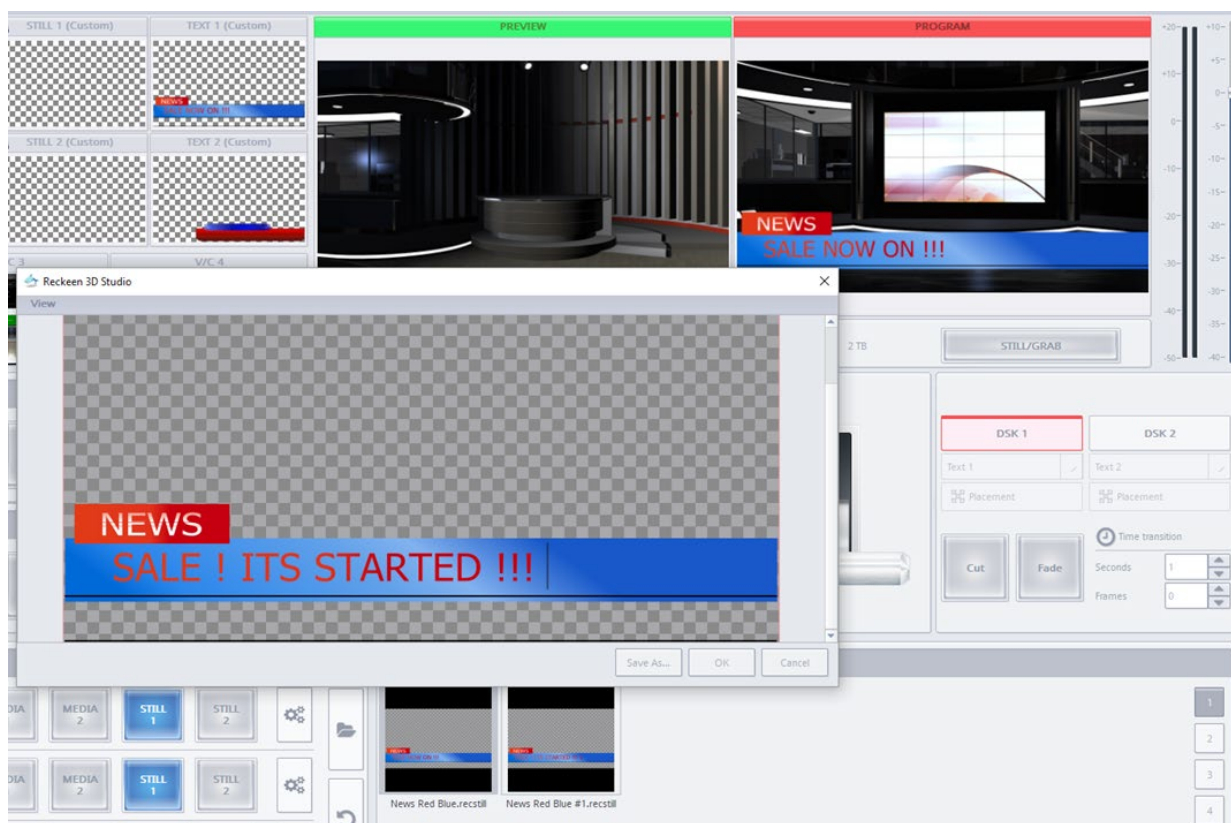
A window opens with a field for entering the text. The current text is displayed there.



Enter the **new text** and click OK button at the bottom of the window.

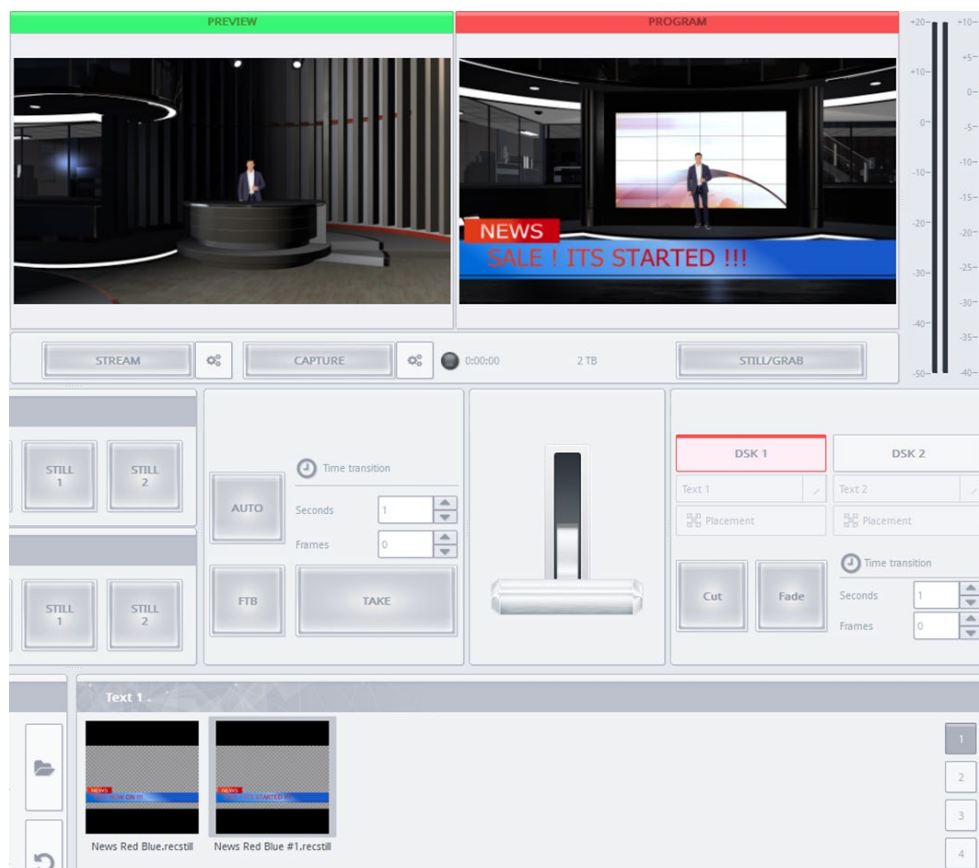


After clicking, you will return to the window with the news ticker's preview. Now you can check, whether the entered message is not too long - it does not "protrude" beyond the screen. If everything is in order, click OK button.

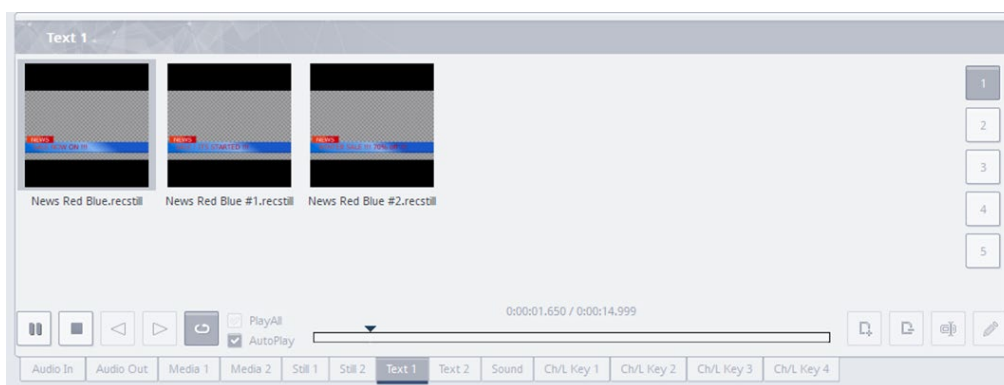


On the air, in the **DSK** tray you have the original file selected, so all you need is to select your newly created and edited clone from the tray. **Double-click** it with the **left** mouse button.

In this way, you have prepared the news ticker changing on the air, without changing the graphics. Image below.



If you clone a couple of news tickers, you can run them in the **LOOP** by **enabling** the **Autoplay** function. Then, the whole sequence of texts shown on the screen with **DSK** will be playing non-stop (Image below). For more information see: Preparing media for broadcast section.



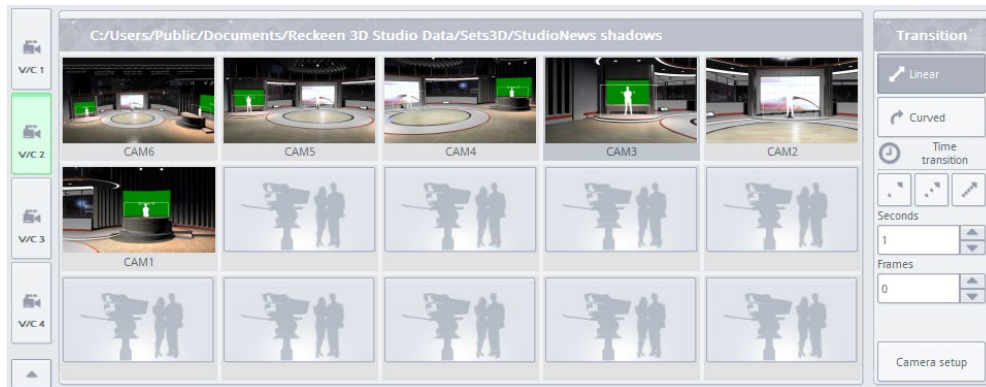
9



Virtual 3D studio
Configuration panel

After opening a production screen of **3D Production**, you will find the virtual studio **Configuration Panel** in the lower left corner. The Reckeen 3D Studio system will always open a new session with a starting studio loaded.

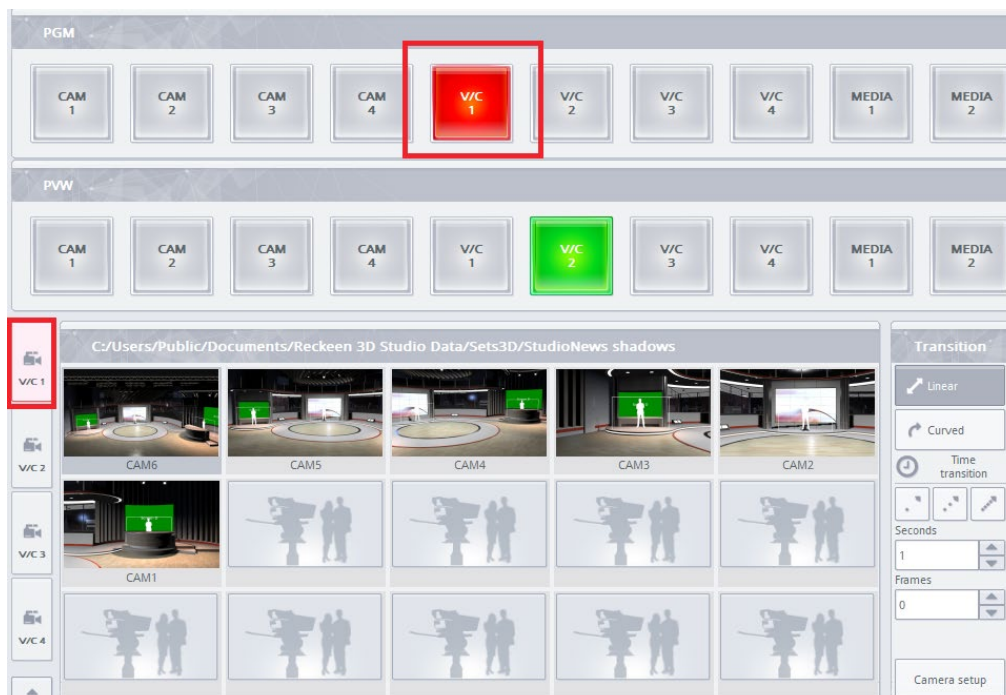
A studio file's path on the disk is displayed at the top of the panel. See the image below:



The Reckeen 3D Studio system is equipped with **4 V/C** channels, that is **Virtual Cameras**.

The backlit buttons **V/C 1** to **V/C 4** on the left side of the configuration panel allow you to choose which group of V/C shots you can currently configure.

The **V/C** buttons in the panel are fully compatible with the main **video mixer**. If you change the status of the main mixer (switch the **V/C** on the **mixer**), whether it is in **PREVIEW (PVW)** section or **PROGRAM (PGM)** section, the button in **V/C control panel** will switch automatically. **V/C** tab button is highlighted in **red** when the virtual camera **V/C** to which it is assigned, is on the air, that is, in a live signal on the **PROGRAM** screen. And when the button is highlighted in **green**, it means the virtual camera **V/C** image is displayed on the **PREVIEW** screen. See the image below

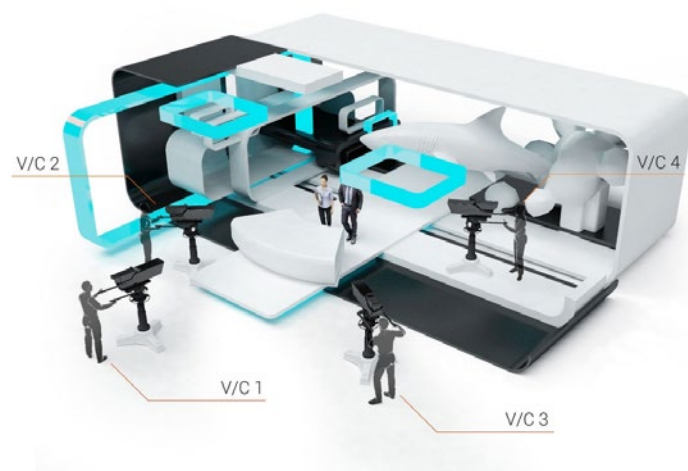


However, the other way around the system behaves differently, due to the safety reasons and functional facilitation. There is no recommended of controlling the **PROGRAM (PGM)** section of the main production mixer with configuration **panel V/C** buttons. Accidental change could cause unexpected result on the air. It is, however, recommended to control the **PREVIEW (PVW)** section. When you change one virtual cameraman to another by clicking the **V/C** button in the control panel, a new button will be highlighted in **green**, and this change will be also immediately visible on the production mixer buttons in the **PREVIEW (PVW)** section and in the **PREVIEW** window.

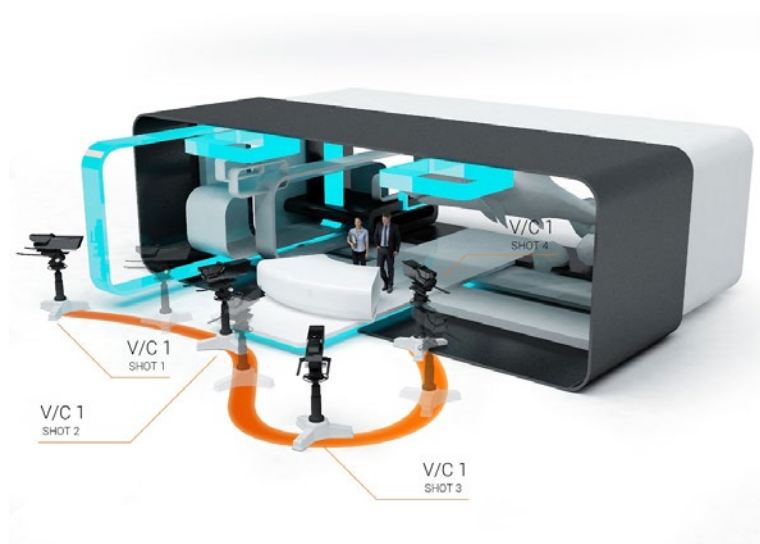
Each **V/C** group is displayed on the screen in the form of up to **15** images showing respective virtual camera shots. The image of an active shot, which will be shown on **PROGRAM** or **PREVIEW** screen, is highlighted in a frame. (Picture above)

In order to help you fully understand the idea of working with the system, you can imagine that each of the **V/C** groups is a separate virtual camera in a studio, and each of them is led by an individual cameraman.

See the picture below.



Shots, on the other hand, are specific positions of a cameraman in the studio. They can be defined for each **V/C** camera and its cameraman - separately. Picture below.



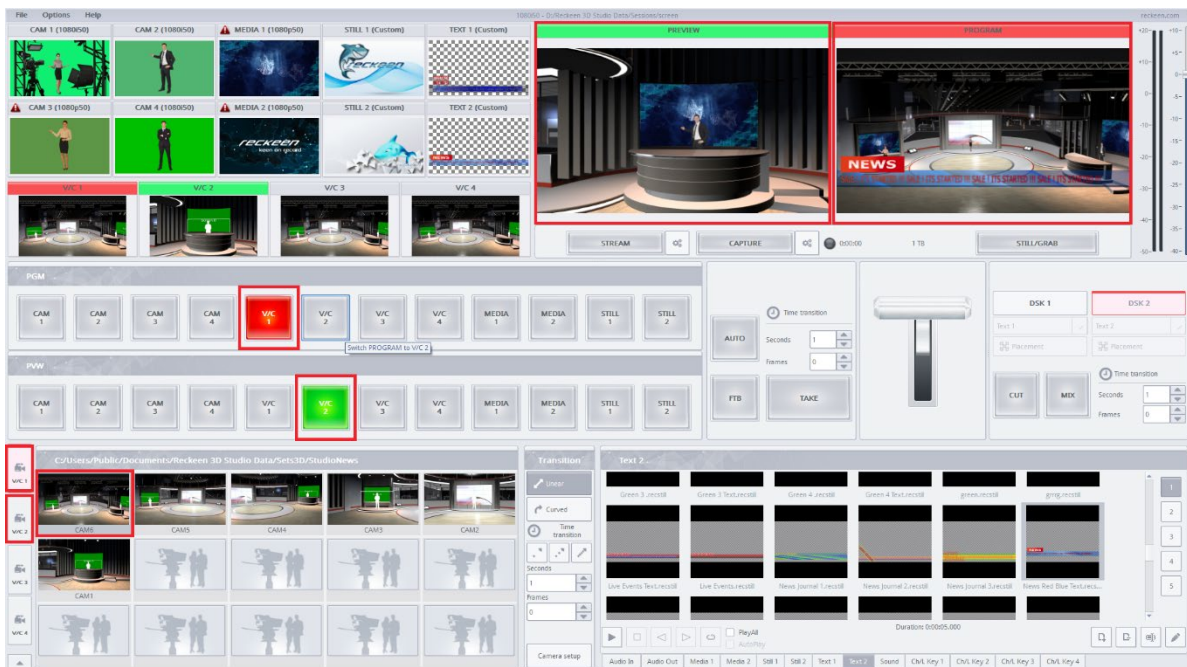
When launching the **3D Production module** with a new session, you get a starting studio loaded with four (virtual camera) groups **V/C 1**, **V/C 2**, **V/C 3** and **V/C 4** provided with loaded shots (cameraman positions in the studio).

The **initial shots** - their number and the way they will look like - are determined by a studio designer.

You can specify up to **15 camera** shots during a studio file design. Each of the shots is named by the designer, and, in this example, it will be a default name - 'Camera 1', 'Camera 2', 'Camera 3', and 'Camera 4' - respectively.

Therefore, this starting studio will have, the same four shots loaded at the beginning for each of the **4 V/C** cameras.

It is a Reckeen 3D Studio application's session file (*.recSession) and not a studio file (*.recSet) that determines which shot is selected as a first one within the V/C group. Note that, by default, in the starting session file the **V/C 1** camera with the **shot 1 (Camera 1)** is set on the **PROGRAM** screen, while the **V/C 2** camera with the **shot 4 (Camera 4)** is set on the **PREVIEW** screen. It is done on purpose, in order not to show the same image on these screens. Picture below.



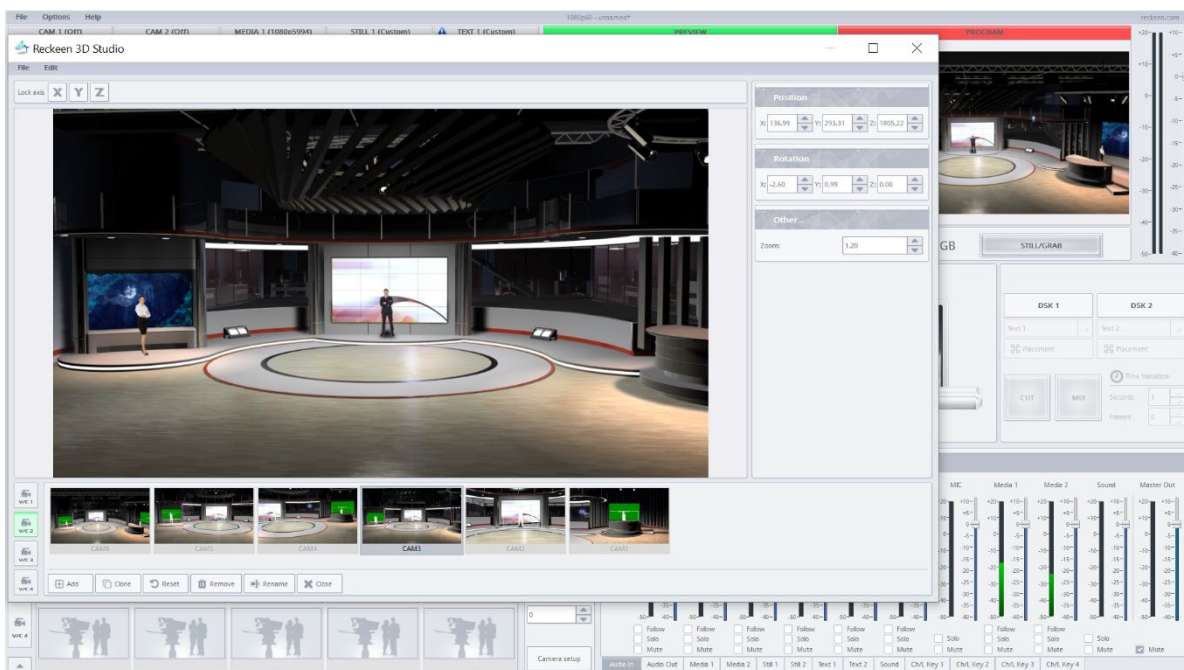
CAMERA SETUP

The startup application allows you to use the default shots immediately after loading. Each user has their own preferences, so there is a possibility to change these settings freely to suit your needs. Here, it will be shown with a case of the second virtual cameraman (**V/C 2**)

If you want to change a position of a camera handled by a virtual cameraman **V/C** in a studio - first, click on the **V/C 2** tab. A view of a shots group opens. Then click on the **Camera setup** icon. Picture below.



A window with settings of **virtual cameraman's** positions will open along with the **loaded shots**. Picture below.



At the bottom left side of the screen, you can see a menu with a list of functions concerning **camera settings** (shots). Picture below.



You can, for example, delete shots - by clicking first on the shot image at the bottom of the screen, and then on the **Remove** button. You cannot remove all the shots - there always has to remain at least one.

There is a possibility to create a new shot with the **Add** button. The first shot that was set as a default for the studio (here Camera 1) will be always loaded as a first view.

You can **clone**, that is **copy**, a position of a camera, and **create a new** shot on its basis. This is done by selecting the current shot, and then using the **Clone** icon.

Reset button allows you to reverse the current shot to the default settings, i.e. to the first shot (Camera_1).

Rename button enables you to assign your own name to the shot, e.g. associated with a camera position in a studio.

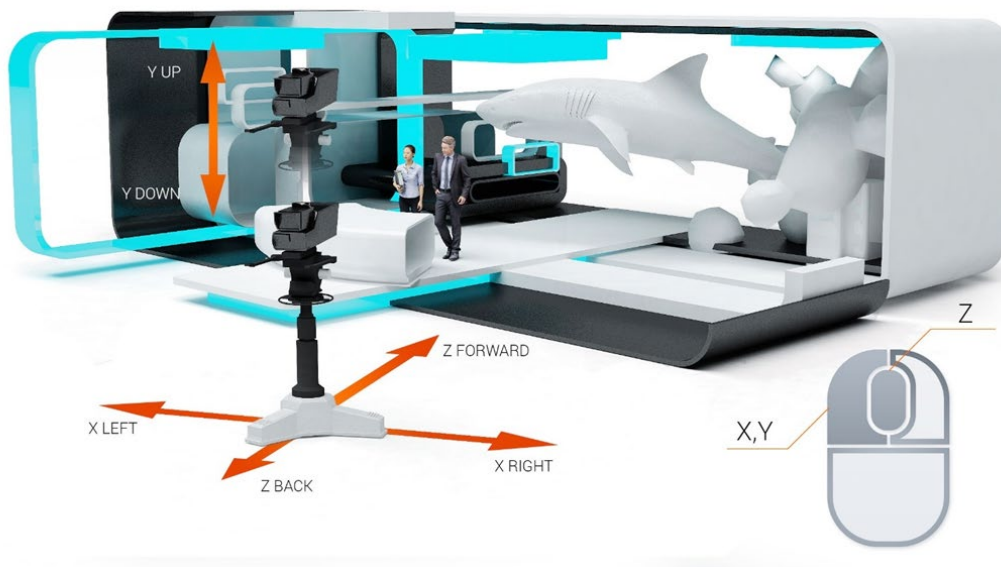
SETTING CUSTOM CAMERA V/C SHOTS

Now, you set your own **camera positions** for virtual cameraman **V/C 2**.

Click on the first window on the list of shots - **Camera 1**. In a large window, a studio image your chosen camera 'sees' at the moment will appear. You can now adjust its view by hooking the mouse cursor on the screen.

With a **left** mouse button, you can move the camera in along **X Y** axes (**X - horizontal**, **Y - vertical**). If you want to move the camera forwards or backwards - use the **mouse scroll**. The same effect can be achieved by pressing the middle mouse button (usually the scroll roller) and moving the mouse **up** and **down**.

Let's imagine that the camera is on a trolley which can be moved - from side to side, and forwards or backwards, - and the camera can be raised or lowered vertically when the trolley is standing still. Picture below.



The movements a virtual camera performs due to the mouse movements correspond to the actual camera movements in a studio (see the image below): movement of the **trolley** from **side to side** - **Track right**, **Track left**. movement of the **trolley forwards** and **backwards** - **Dolly in**, **Dolly out** raising and lowering of the camera vertically - **Pedestal up**, **Pedestal down**

Description of real camera movements in a studio . Picture below



Now let's use the right mouse button.

Click the [right](#) mouse button, hook the cursor on the screen and direct the view of your camera.

This reflects a real situation, where a camera stands still on a tripod in the studio, and you only change the direction of its vision on a tripod head, that is rotate it horizontally and vertically.

This corresponds to the actual camera movements in the studio - turn to the left and to the right, that is [Pan right](#) and [Pan left](#).

Rotation in the vertical plane: turn up and turn down: [Tilt up](#), [Tilt down](#).

In addition, there is a [Zoom](#) function - not available with a mouse, but from the screen level in the [Other](#) section.

In the [Zoom](#) function, you can adjust the image from the camera, zooming in and out without making any changes in the perspective or on the image plane. This is an equivalent of changing a focal length of the lens.

SECTIONS: POSITION, ROTATION, OTHER

At the top right of the [Camera setup](#) screen, there are 3 sections available: [Position](#), [Rotation](#) and [Other](#) with Zoom function. Picture below.



Position		
X:	136.99	
Y:	293.31	
Z:	1805.22	

Rotation		
X:	-2.60	
Y:	0.99	
Z:	0.00	

Other	
Zoom:	1.20

Position

The X, Y, Z coordinates show the exact position of the camera in the studio in relation to a point $X = 0$, $Y = 0$ and $Z = 0$, the position of which was set by a graphic designer of a particular studio. If you want to find this point in a studio, type a 0 value in the fields X, Y and Z - and a camera will move to this point. In the case of the presented studio, this point is located more or less on the floor behind the desk.

To enter a specific value, position your cursor at a beginning of a value field and drag (select) the entire field, then type in the desired value with a keyboard. You can also change the value by clicking on the white up/down arrows on the right side of each value field.

Movement in the X axis: moving the camera trolley to the right will mean increasing the positive values for our studio, and moving the camera trolley to the left - increasing the negative values.

Movement in the Y axis: raising the camera above the floor - increasing the positive values, while lowering the camera below the floor - the negative ones.

Movement in the Z axis: if you increase the positive values - the camera moves away from the desk, and if you increase the negative values - the camera moves forwards, deep into the studio.

Our virtual camera has no limits!

Note: in the studio, all the values of X, Y, Z are given in centimeters when they represent a linear motion. This means that, for example, a value of 100.80 means 100.8 cm in a virtual 3D studio. If the values refer to the circular motion, they are expressed in degrees, that is, for example, a value of 45.00 for Rotation stands for 45 degrees.

Rotation

The coordinates represent a rotation, that is, an angle at which the camera is pointed. The camera trolley is stationary and the camera stands still, but it can 'look' in all directions. In this set design, the **Rotation 0** point means that the camera is pointed exactly straight at a Talent (a presenter) behind the desk.

Movement in the X axis means increasing the positive values for this studio - namely lifting the camera lens on a tripod (up until the camera is looking at the ceiling). Increasing the negative values - tilting the camera lens down (until the camera sees the studio floor).

Movement in the Y axis: camera rotates to the right with the increase in the negative values, and to the left - when the positive values increase.

Movement in the Z axis means tilting the camera from side to side. In an actual film or TV studio, this movement is called cant and is used, for example, to achieve the Dutch View, where a camera is tilted slightly to one side in relation to a vertical axis, all resulting in tilting of the image. (See the picture - a description of camera movements at the beginning of this section).

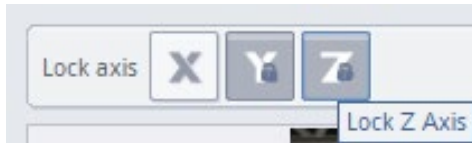
Zoom function: this feature sometimes substitutes a shot where a trolley moves straight ahead, but the difference between these two methods of operating the camera is significant. Zoom enlarges or reduces the camera image without causing changes in a perspective and in the image of a studio space. The trolley movement, on the other hand, brings you closer to an object, just as zoom does, but at the same time it changes the perspective and image of a studio the camera 'sees'.

LOCKING X, Y, Z AXES

Setting several camera movement parameters at the same time can be difficult at the beginning, so you can make this process easier by disabling some of the movement possibilities. This is done with a

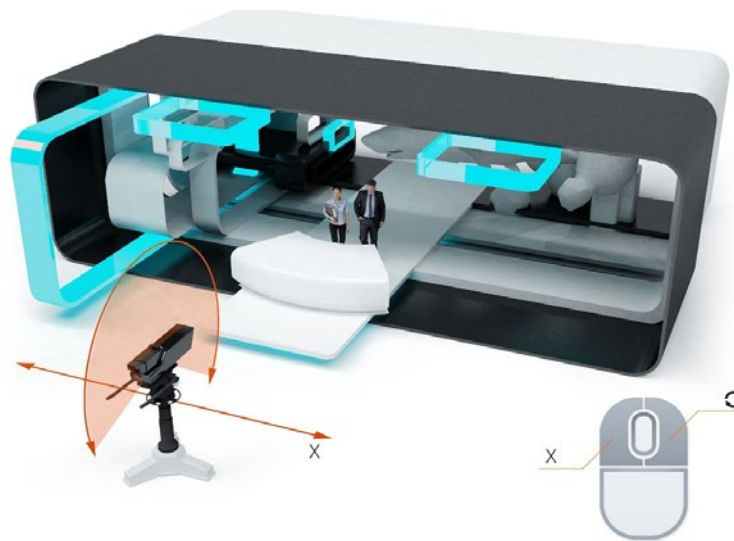
function that blocks the axes (**Lock- unlock axis**). The icons of this function are located in the upper left part of the screen (see the picture below)

In the picture above, you can see a situation where a camera movement in Y and Z axes has been locked. Axes' icons have turned color and picture of padlock has appeared. Movement in the X axis is allowed (if you also **block** the X axis, the camera will be completely immobilized).

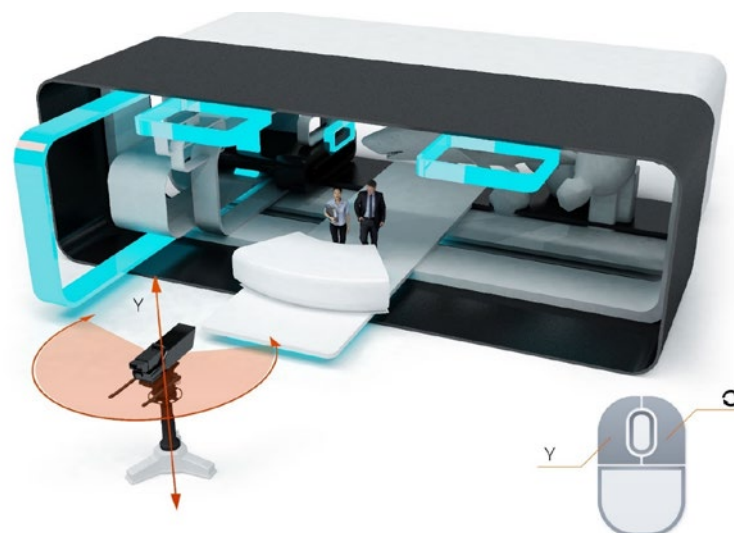


In the case shown above, the camera will be able to move only to the left and to the right when you use the left button of the mouse, and to rotate up and down when you use the right button.

To illustrate this situation, you can imagine that the camera moves along a long tube and can move only lengthways or along its perimeter. Picture below.



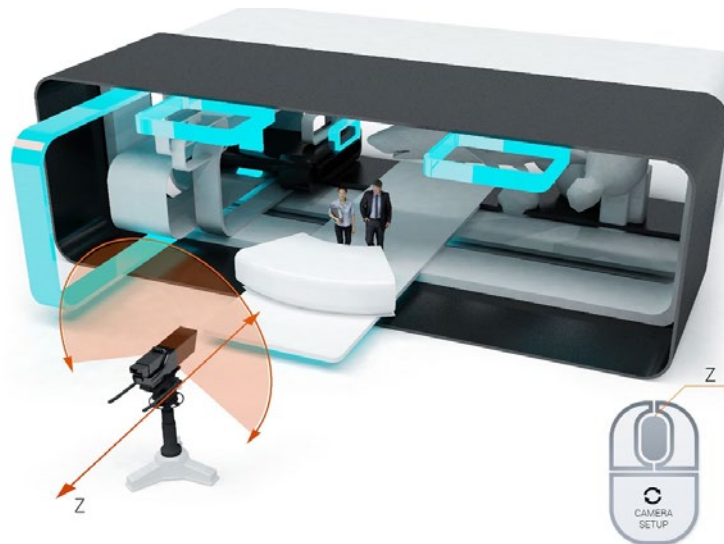
When you **lock X and Z axes** - Y axis is unrestrained. In this case, the camera will be able to move only up and down when you use the **left** mouse button, and to rotate to the right and to the left if you use the **right** button. Picture below.



In case of **locking X and Y axes** - you have Z axis unrestrained.

In such circumstances, only a mouse scroll operates, which corresponds to the camera trolley movement forwards and in backwards. The rotation can be achieved through changing the Z value in the **Rotation** section (by clicking on the up and down arrows).

(As shown below)



This kind of blocking the two axes allows for accurate and precise positioning of the camera in the studio, in one of the selected axes. After adjusting the camera in this axis, you can move on to the next one, and so on, until you achieve the desired camera view. You have then an exact position of the camera (a shot) set.

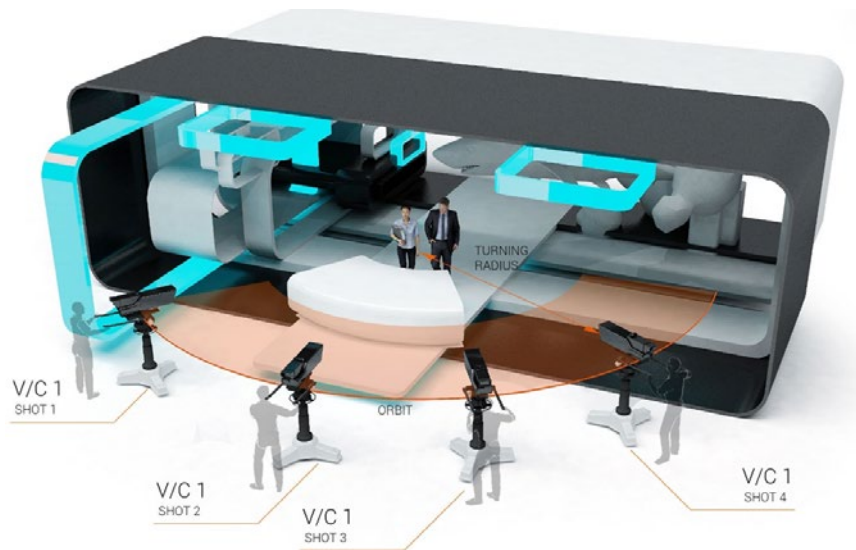
You may also block just one of the axes, enjoying the greater freedom of camera movement, but it is then more difficult to position a camera accurately and precisely.

ORBIT MOTION

Another type of movement that can be executed in the 3D studio when setting the camera shots, is an **Orbit** motion. Imagine that you are sitting on a rotating carousel looking all the time at the center of a circle, namely at an axis of rotation. A camera in the studio can make a similar movement - a circle around a selected item, all the while pointing at it.

Note: To better explain what the **Orbit** motion is, let's assume the camera always looks straight ahead at an object, for example, a Talent. **Orbit** motion can, in fact, maintain any chosen angle direction of viewing. For example, if you move a camera by an angle to the side in Orbit motion, seeing the Talent on the side of the screen, as if 'from a corner of your eye', the moving camera will keep this angle the whole time. This means that during the subsequent shots you will see your Talent 'from a corner of your eye' all the time, namely on the side of the screen.

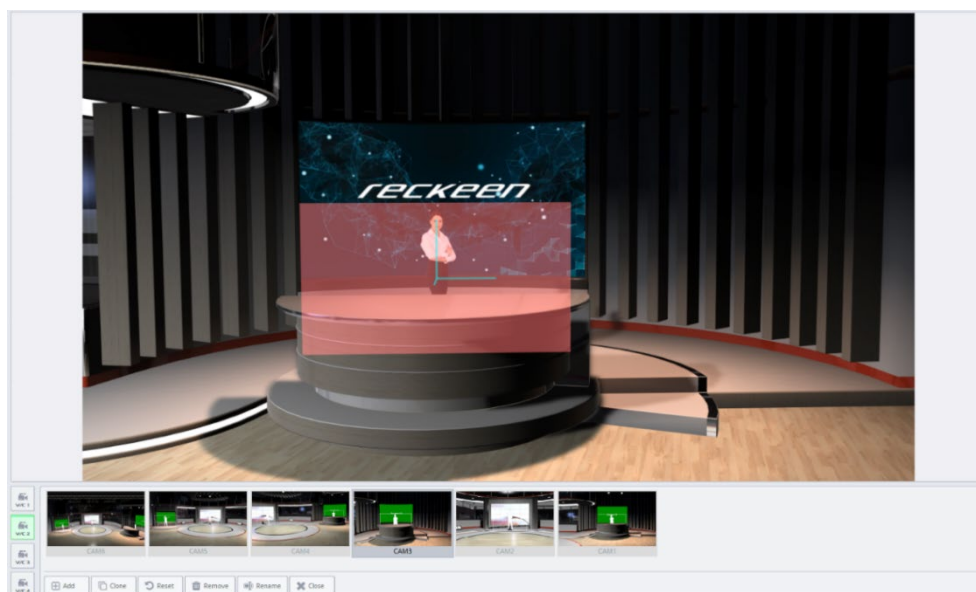
You can, for example, set several virtual camera **V/C 2** positions around the Talent. See the image below.



Positioning a camera in **Orbit** motion starts with selecting an object in the studio, which will be the center of rotation for the virtual camera orbit (circular motion).

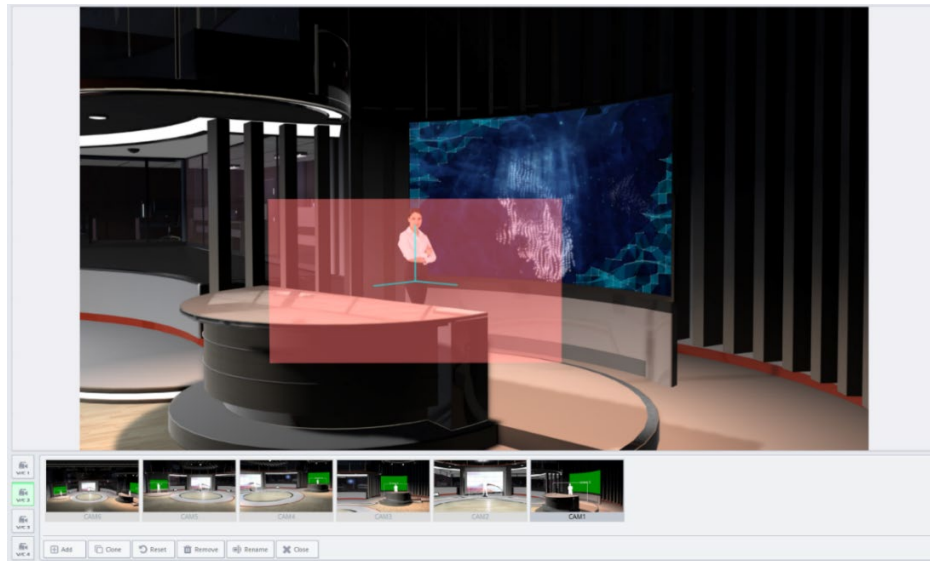
Click the left mouse button on a figure of a presenter. A whole rectangle with the Talent figure lights up in **red** - it represents a view from the real camera. A **3D Gizmo** appears on the rectangle - it will facilitate setting X, Y, and Z axes in your studio.

Additionally, **3D Gizmo** facilitates determining the center of, for example, a group of objects, if such a group has been created by a graphic designer. A group of objects, e.g. **lights** in the studio, can be highlighted all in **red**, but thanks to the **3D Gizmo**, you will be able to specify where the center of the object is, that is where the camera will be pointing at. Picture below.



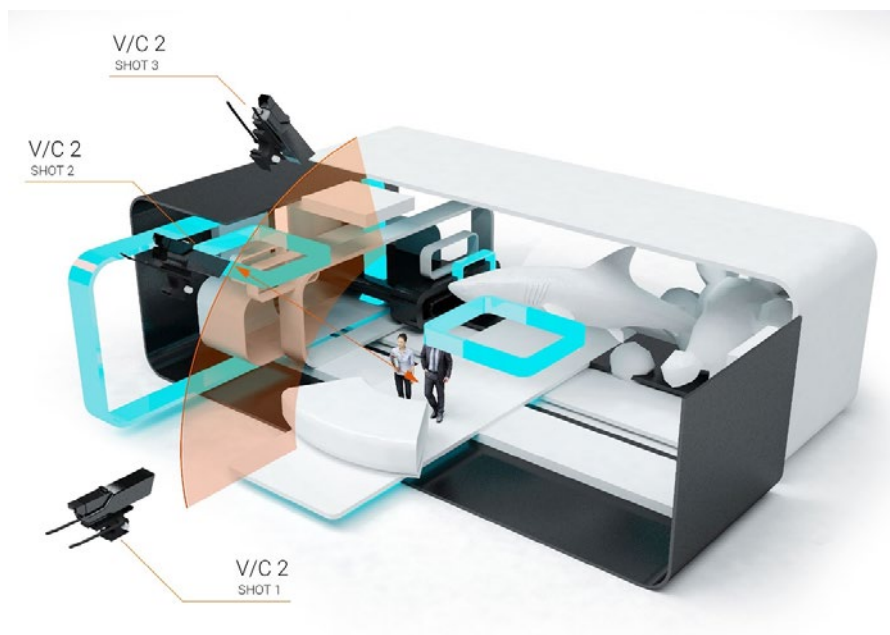
Then, with a **right-click**, you can change and select more virtual camera's positions around the Talent in the studio.

Your camera will be able to move to a different position on a circle (orbiting), and also up and down, all the while facing the Talent. You can, for example, select a position in a circle, but under the studio's ceiling - the camera is pointing at the center of the selected object all the time. See the picture below.



If you want to achieve [Orbit](#) motion solely along a circular track without changing the height of the camera, you should use [Lock axis function](#) and [block X and Z axes](#).

The [Orbit](#) motion is possible also with [axes Y and Z locked](#). You get the effect of a camera moving along a circular track, but vertically. Just like the Ferris Wheel: you can imagine that the cameraman is sitting in the wheel's carriage and the camera is looking at its center, where the selected object is located. It means, at the starting position the camera can be, for example, at the floor level and then, with the circular motion, it can move to the studio ceiling - all the while facing the Talent. Picture below.



If you lock only the [Y axis](#), then, in addition to a vertical Orbit motion ('Ferris Wheel carriage') carried out with a [left mouse](#) button, you can move the camera from side to side - to the left and to the right using a

right-click

ADJUSTING VIRTUAL CAMERA V/C POSITION AROUND THE TALENT IN ORBIT MOVEMENT

Select a [virtual cameraman](#), V/C 3 for example. You start with one initial camera shot (preferably one where the camera is facing the Talent directly). The desired distance between the camera and the Talent is set with a mouse scroll (that is with 'riding the camera trolley' forwards and backwards). This will be a radius of a circle, a center of which is the Talent. With a left-click, select your object, which highlights in red. Remember not to move the mouse at the same time, as it won't select the object, it will only change the view.

With a [left](#) mouse button set a desired height of camera's view vertically. Now use [Lock axis](#) function and [block X](#) and [Z axes](#) (see the picture below) to get an [Orbit](#) motion solely along a circular track without changing the height of the camera.

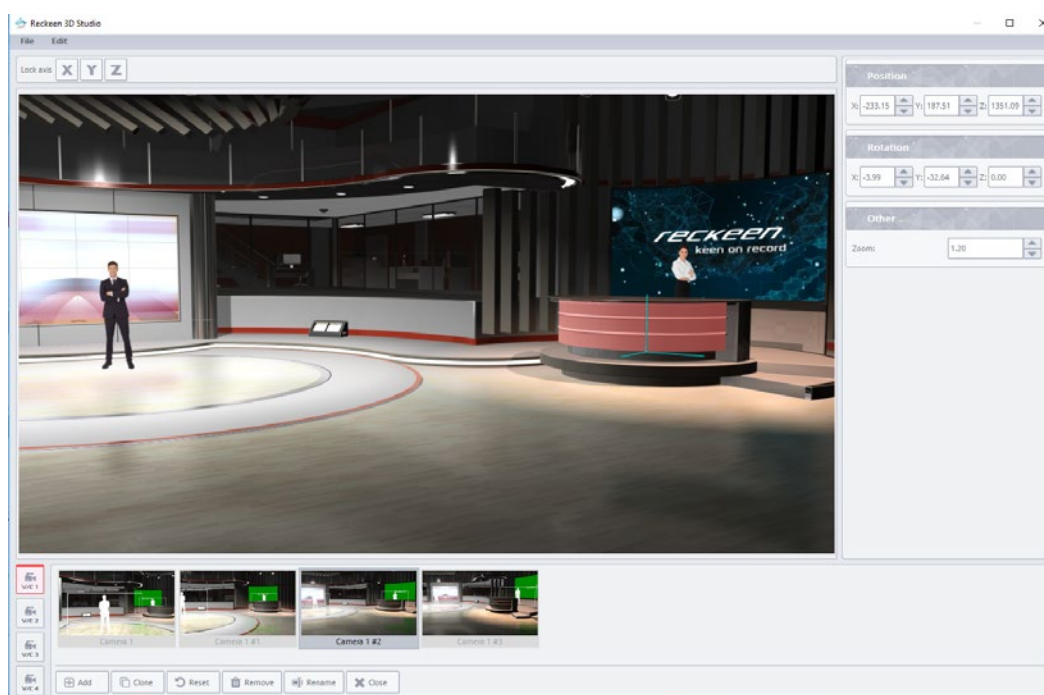
Execute camera's [Orbit](#) motion (rotate) around the Talent with a [right-click](#) and select the first shot.

Make a [clone](#) of this shot. Then, in a new shot, move the cameraman to the next position using the [right](#) mouse button. Set the desired camera position.

Make another [clone](#) and repeat the steps to get a satisfactory number of camera positions. The more camera shots you create, the more accurately the camera will move along a circular track.

In this case, [6](#) camera shots, that will rotate around the Talent, were chosen.

As all the shots are [Camera 1](#) shot clones, they have the same name. If you want to change them - use the [Rename](#) button. Six camera shots were created for the virtual cameraman V/C 3, starting from the left side of the studio and ending on its right side, all the time moving along a circular track. You can see the last shot in the picture. Picture below



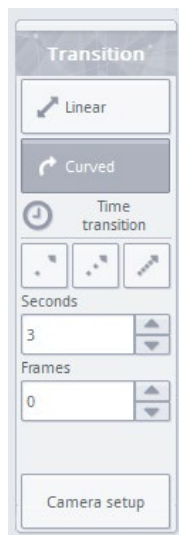
FUNCTIONS OF VIRTUAL CAMERA V/C TRANSITION MOVEMENT BETWEEN SHOTS

6 cameraman V/C 3 shots for ORBIT motion have been set in the previous section.

There are 3 ways to navigate between camera positions in the virtual studio: [Cut](#), [Linear](#) or [Curved](#). Remember that shots are set in the [Camera setup](#) window, and in the [3D Production](#) module, the realization of transitions between the given shots takes place. As shown below.



It can be done with [Cut](#) transition, that is immediately, without any delay. Cut is triggered by right-clicking on the shot's thumbnail.



There is also a possibility to set the time and type of camera's transition movement from one position to another - [Linear](#) or [Curved](#). These functions can be triggered with a [left-click](#) on the thumbnail.

If you choose [Linear](#) function, the camera will move between successive positions along straight lines, even though the camera positions have been set on a circle.

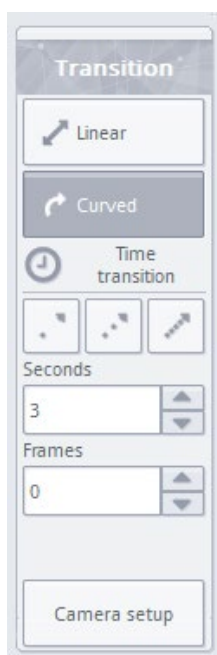
The picture below.



If you want the camera to move along an arc also between the shots - select the [Curved](#) function. The camera will be moving on a curve calculated by the Reckeen 3D Studio system, as shown above. Camera movement will become 'fluid' and will recreate the Orbit motion more naturally.

Enabling the Curved function corresponds to a real camera movements in a studio (see the picture: Description of camera movements in a studio) - [Arc right](#), [Arc left](#) (if you move the camera trolley on the studio's plane) or [Tongue right](#), [Tongue Left](#) movement (if you operate a camera on a crane horizontally), or [Crane or boom up](#) / [Crane or boom down](#) (if you move the camera on a crane vertically).

SPEED OF VIRTUAL CAMERA V/C MOVEMENT BETWEEN SHOTS



For your convenience, default speed of transitions between camera shots had been defined in the Reckeen 3D Studio system. They can be switched on with [S](#), [M](#) or [F](#) icons - [Slow](#), [Medium](#), [Fast](#).

Speed of transition can be also controlled with up-down arrows located below [S](#), [M](#) and [F](#) buttons.

WORKING WITH 4 VIRTUAL CAMERAMEN V/C

During the production, you can change the settings of each cameraman by clicking on the [shots' miniatures](#). You can then wander around the studio with one selected cameraman, e.g. with a camera set to move according to the [ORBIT](#) motion, as in an earlier example.

Producer can also switch between [V/Cs](#), choosing a virtual cameraman an image from whom will be show on the vision. Switching between views from different virtual cameramen [V/C](#) can be done with a production mixer and functions: [Take](#), [Auto](#) or with a [T-Bar](#) handle.

After switching to a different cameraman, you can operate again on the shots defined in this [V/C](#) group.

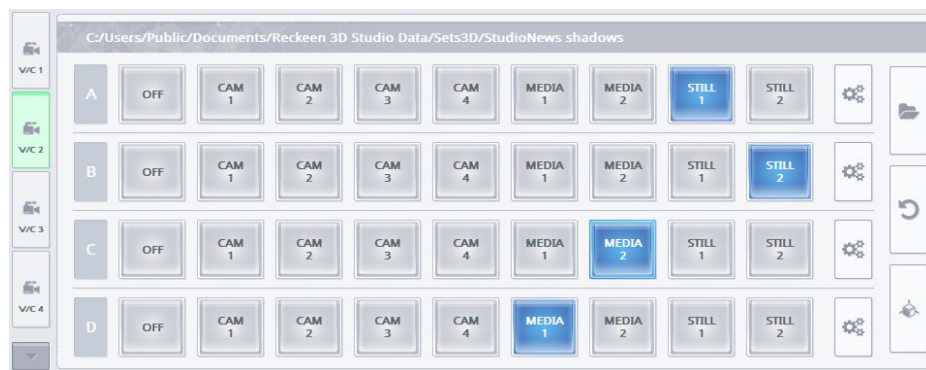
Possibilities of cameras' movements provided by the virtual studio Reckeen 3D are the same as in a real TV studio. Hence, we can recreate diverse, complex camera movements used in [TV](#) or [film techniques](#)

and assign them to virtual cameramen [V/C](#).

If, for example, the loaded studio has sub-studios, then one virtual cameraman can operate in the main studio and a different one in the sports studio, with another in a the weather studio and so on

LOADING A NEW STUDIO

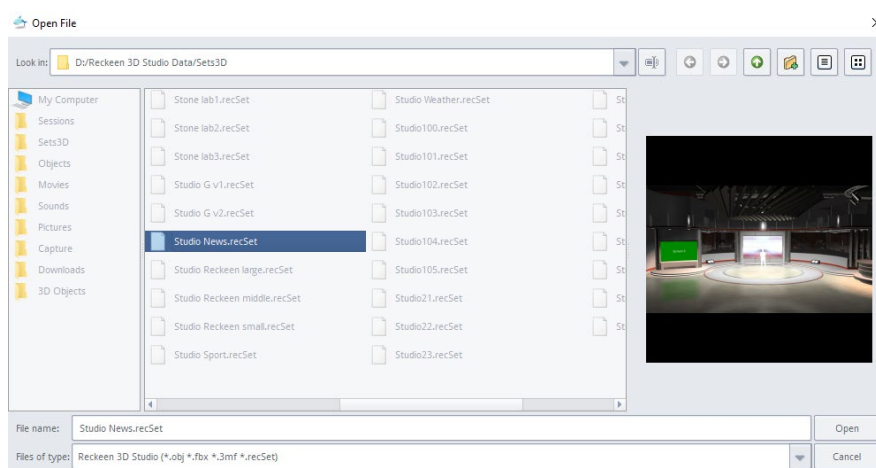
By clicking on the icon with the arrow in the lower left corner of the screen (image below), you can open an additional panel for selecting [A](#), [B](#), [C](#) and [D](#) signal sources for your studio. There are also [Load](#), [Reset](#) and [Studio Editor](#) icons located on the right side of the panel. Picture below.



If you want to load a [new studio](#), click on the [Load](#) icon (in the upper right corner of the picture above) and select a [studio file](#) from the disk. The supported [3D studio file formats](#) are: [*.obj](#), [*.fbx](#), [*.3mf](#), [*.recSet](#).

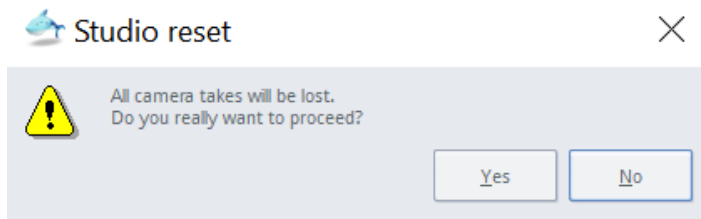
Note! Remember that, if you introduced your own set of virtual cameras V/C shots earlier, then loading a new studio will erase the results of your work.

Select a file in a file selection window that opens up. When you click on the file, a preview of its set design appears in a window on the right.



Remember: if, during the session, you Load a new studio with the Load icon (i.e. not using a previously created and saved session), then initially all the default shots are set in their first positions for all cameras [V/C](#). You need to change that, as otherwise both [PREVIEW](#) and [PROGRAM](#) screens will show the same view.

The [Reset](#) button, located below the [Load](#) button, resets 3D studio cameras to the default shots.



It means you return to the initial default camera settings, as if a brand new studio was loaded.

In order to avoid losing your work associated with setting virtual cameras' positions in the studio, you will be warned with a message when you press this button .

If you want to keep the results of your work, [save a session](#) file. In this file such settings as a kind of studio you used and all the virtual cameramen's camera settings you have created will be preserved. You can use them later in realization of your program.

SELECTION OF SIGNAL SOURCES A, B, C ,D

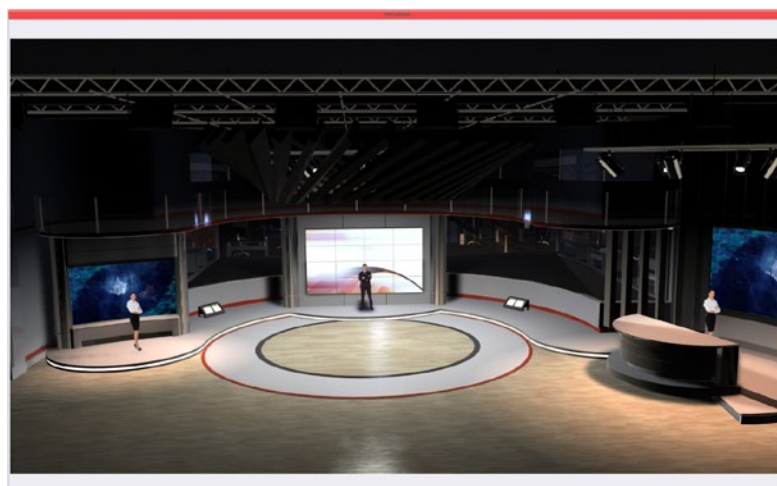
The setting all the [A](#), [B](#) ,[C](#) and [D](#) sources is identical for all cameramen [V/C](#).

The fundamental part of studio configuration is a selection of a source. Usually, a studio project allows you to place there [4 input](#) signals [A](#), [B](#) ,[C](#) and [D](#) that are set on the mixer in an additionally opened panel.

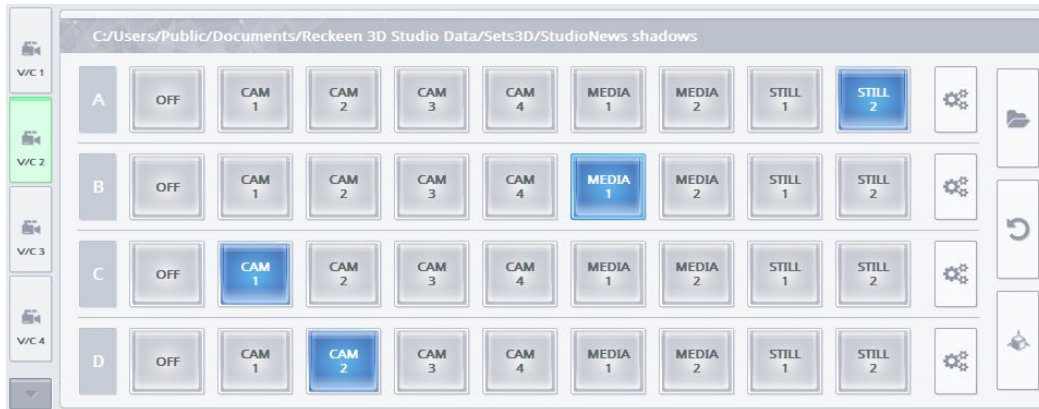
In a studio design, the first two of them, namely [A](#) and [B](#), are almost always images of presenters ([Talents](#)), from [CAM 1](#) to [CAM 4 sources](#). A keying filter is applied to these sources.

The applied key removes a uniform background (e.g. [green](#)), on which the presenter is filmed.

The third and fourth signal source – [C](#) and [D](#) may be a [film](#) or a [still image](#). They are usually displayed on virtual screens that are a part of studio scenography. Everything depends on the project. In the picture below, you can see tree images of presenters ([source A](#), [B](#), [C](#)) and [studio screens](#), where a film ([source D](#)) is displayed



Most often the default [A](#), [B](#) , [C](#) and [D](#) sources were defined by a studio designer, but you go to the [Studio Editor](#) and create your own settings, e.g. [remove a Talent](#) or [add a screen](#). In each studio, signals can be used in a different way. Due to this flexibility, the signals have been described in a studio configuration panel in a universal way - symbols [A](#), [B](#) , [C](#) and [D](#) (image below)



There are four separate rows of buttons with identical descriptions for [sources A, B, C and D](#). This enables a separate regulation of parameters for sources [A, B, C and D](#).

The input signal for studio composition can be: a [transparency \(Off\)](#), a [camera image \(CAM_1, 2,3,4\)](#), a [video file \(Media 1, 2\)](#), an [image/bitmap \(Still 1, 2\)](#),

And so are called the buttons located in four rows below the studio previews. The button with selected source is highlighted. Changing the [input source](#) takes place immediately, so you can change it during the live broadcast.

After selecting the appropriate [signal sources](#), a figure of a presenter will be displayed against a studio scenography, and a selected video file or a still image will be shown on virtual screens. If a keying filter has not been enabled for the source with a presenter figure, you have to switch it on and set its parameters. After applying the correct keying parameters, a background against which the presenter is filmed (e.g. [green](#)) will be removed and the figure of the presenter will be visible against the background of the studio scenography.

In order to make the figure of the presenter fit better into set design you have used, you can adjust the [figure's size](#) and [position](#) in the studio. A separate window is used for changing these parameters. The window can be opened with a button located next to the buttons used for the studio's signal sources selection.

This window works on the same principle as the [Placement](#) window earlier described in the [DSK](#) section. The only exception is an additional function [Aspect Ratio: Keep / Stretch](#) described on the following pages of the manual.



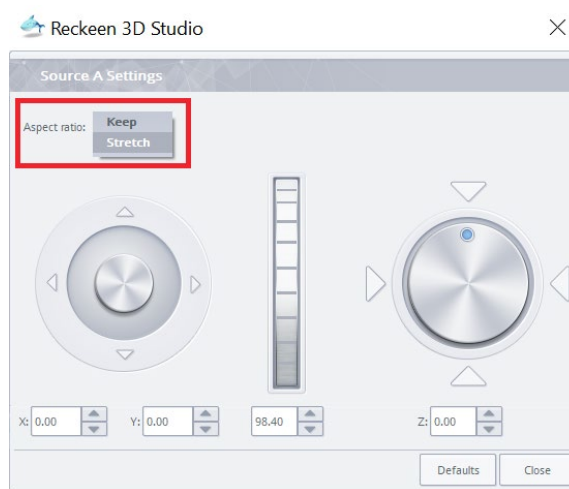
ASPECT RATIO FUNCTION: KEEP/STRETCH

With this function, you can set the aspect ratio for sources [A](#), [B](#), [C](#) or [D](#), for movie files or for images.

The [Keep](#) option allows you to maintain the source's aspect ratio, while the [Stretch](#) option stretches the image to cover the whole desired area. See the following example.

If, for example, a video file with its aspect ratio of [4:3](#) is placed in a studio on a display, which has an aspect ratio of [16:9](#), the image file proportions will be maintained and the 'lacking' space on the screen will be transparent.

If you select the [Stretch](#) option, the image of an aspect ratio of [4:3](#) will be stretched to [16:9](#) proportions, and there will be no uncovered space on the display. You have to remember that the stretched picture will not have the previous aspect ratio.



SAVE SESSION FILES

In order to keep all the [studio settings](#) ([selected sources](#), [virtual camera V/C positions](#) and [settings](#), and [others](#)) and be able to use them for the next production, there is a possibility to save them in a session file. To open such saved settings, you have to load an appropriate session file at the start of [3D Production module](#).



Virtual 3D studio editor

10

The goal of working with the editor is to prepare a studio before a [live broadcast](#). You should keep in mind that, if one of the [V/Cs](#) is selected in the main [PROGRAM](#) mixer at the moment and you want to make some modifications in the editor - it can cause some unexpected changes seen directly by the viewers, e.g. a studio element disappears.

You can open the editor with [Studio Editor](#) button. As shown below.

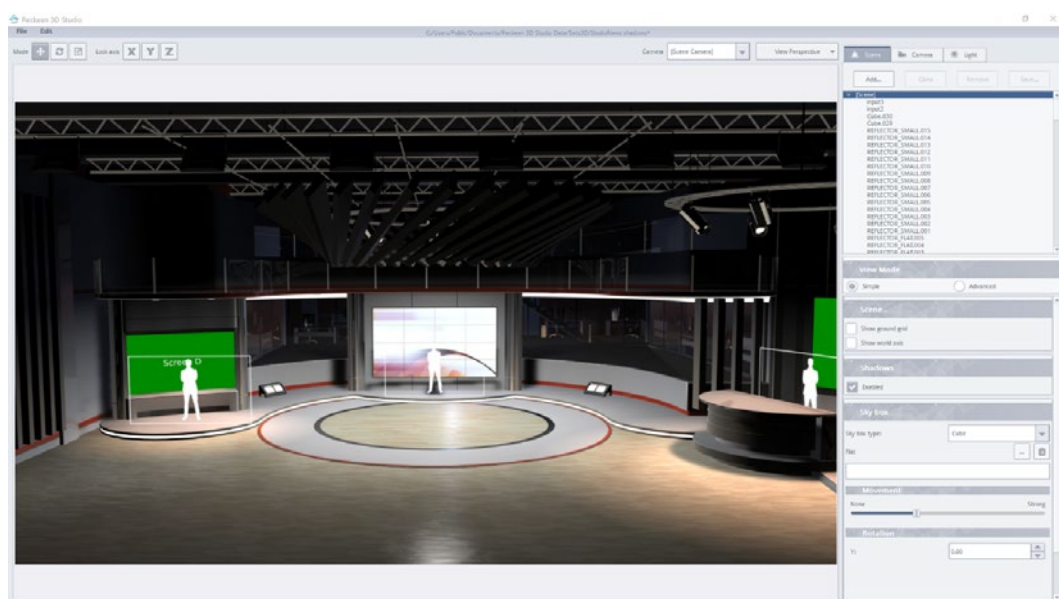


After opening, you can see the [editor screen](#). The Reckeen 3D Studio system operates on a single file virtual 3D studio project loaded, but it can be a very complex one. You can add another studio project to the already existing one and place it on the same set, e.g. by its side or at the top. The second studio is added with the [Add...](#) button in [3D Editor](#).

This way you will have in one file, two different studios with the possibility of two (e.g. [V/C1](#) and [V/C2](#)) cameramen in one virtual studio and two (e.g. [V/C3](#) and [V/C4](#)) in the other studio.

After adding a new studio, it may not have lights. If your studio is dark you have to [add light](#) to it.

See the picture below.



OPERATING MODES: CAMERA AND OBJECT

First, let's discuss the different operating modes of a mouse on the 3D editor screen:

Camera operating mode

Clicking with a simultaneous movement.

Left mouse button: change the camera's position/view in the studio in **X, Y axes**. **Scroll** - move the camera forwards and backwards in the **Z axis**.

Right mouse button: rotate the camera in a studio - to the left or to the right and up or down.

In this mode, the mouse can **lock X, Y, Z axes** in order to position a camera view accurately, just as in the Camera setup.

On the picture below – two **axes** (X and Y) are locked, so the movement is possible only in the **Z axis**.



Object operating mode

If you **only click** the left mouse button, you will select the object located at the cursor's position. The object will be highlighted in red and a **3D Gizmo**, which is an indicator allowing you to edit the object, will be displayed for it. The type of the Gizmo indicator will depend on the selected object's editing mode (move, rotate or resize). You can see a 3D Gizmo portrayed with arrows in the following picture, it allows you to move the object in all 3 axes.



With right-click on the **3D Gizmo** you can carry out an orbit operation on the highlighted object. This operation is described later on in this manual.

When the object is selected with a cursor and highlighted, you are still able to move your camera. Just click the **left** mouse button and move it simultaneously, but this time - beyond the red outline of the object. This allows you to position the object better in your studio, being able to see it from every possible angle.

If you want to disable the object's highlight - just click the **left** mouse button again on the object highlighted in red. The highlight will disappear, thereby signaling leaving the Object operating mode.

EDIT: UNDO AND REDO FUNCTIONS

There is an **Edit** option available at the top left side of the screen. You can trigger **Undo** and **Redo** functions from the drop-down menu or through the keyboard shortcuts. Undo: **Ctrl+Z**, Redo: **Ctrl+Y**

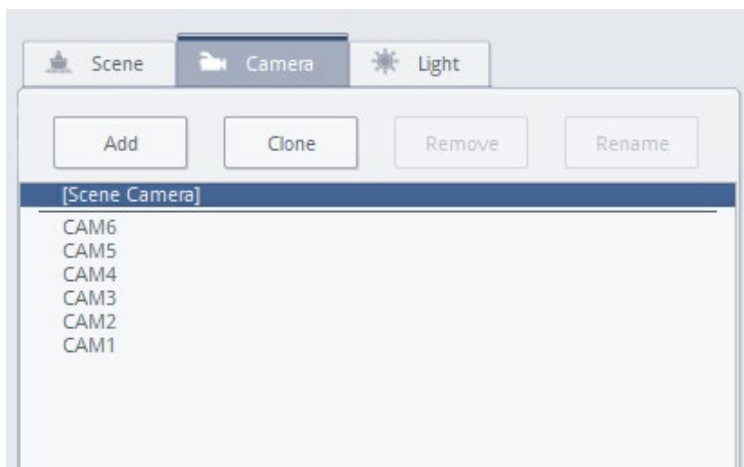
- **Undo** function - erases the last introduced change.
- **Redo** function - reverses the Undo command.

Note, however, that if you undo several operations and now you are performing a completely new operation, all undone operations will be deleted from the job queue (list of tasks). In case you perform a lot of operations, the system can limit the amount of memorized operations that can be used with **Undo**, **Redo** functions.

CAMERA TAB

There are the following tabs at the top right of the screen: **Scene**, **Camera** and **Light**.

Let's choose a **Camera** tab. Picture below:

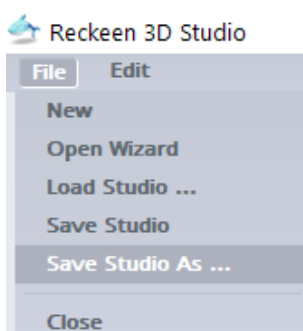


A list of default camera shots for the studio will be displayed. These shots (their number and type) have been defined by the designer of the studio.

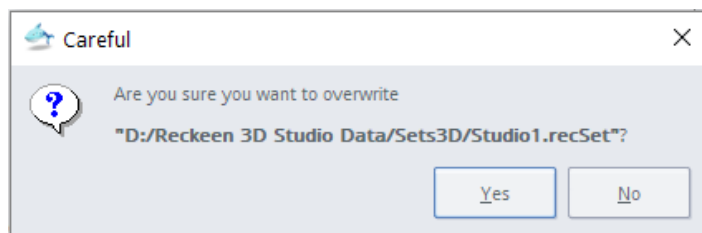
If you choose **Camera 1** shot, its view will be visible on the screen. You can change this shot by setting the camera differently with mouse buttons in the Camera mode. **Remember** that this way you will not be able to change in the editor the shots currently loaded to the production module.

These shots will be loaded into **V/C** groups only after reloading the studio project file to production. When you finish the editing,

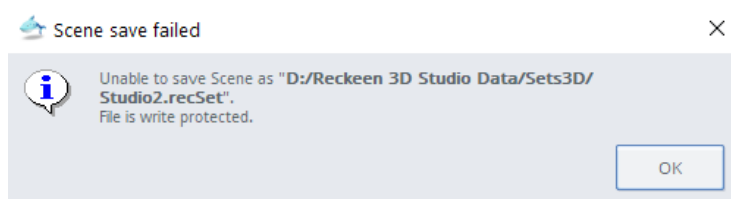
you can save such altered project as a new studio under a new name.



The studio file should be **saved under a different name**, because if you try to save it under the **same name**, the system will warn you with a message concerning an attempt to overwrite the file.

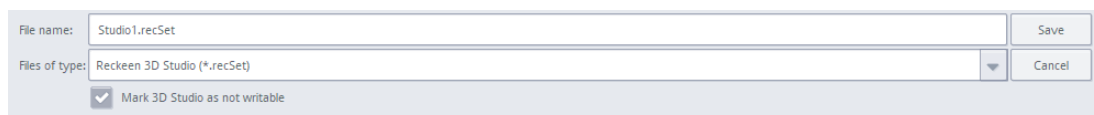


If you decide to [overwrite the file](#) and the given file is [write protected](#), you'll get a message, as shown below.



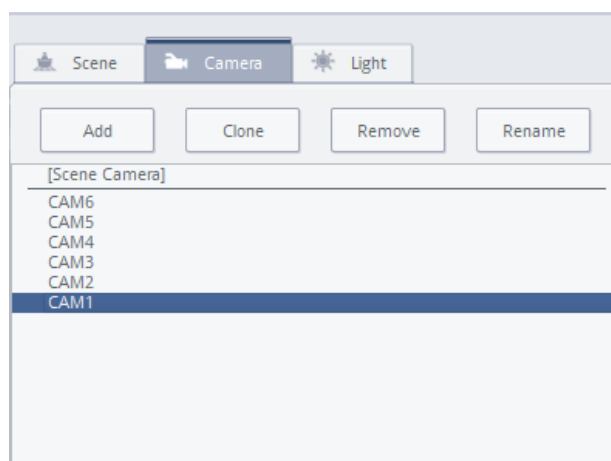
If you want also your [new file protected](#) against overwriting (changing), check the appropriate option during the process of creating this new file - [saving it](#).

See the picture below.



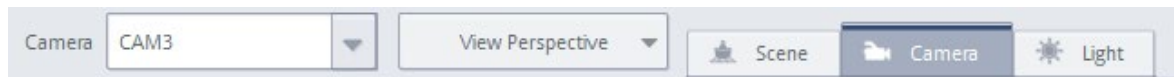
You can also change the number of the new studio's default shots by: [adding a new shot](#), [cloning a chosen shot](#), deleting some of the shots or changing their name - with [Add](#), [Clone](#), [Remove](#) and [Rename](#) functions

The picture below - five new shots were added to the four shots created by a graphic designer.



You can define up to 15 new default camera shots. They will be immediately visible in the [Camera setup](#) in the V/C 1 to V/C 4 after loading a new studio to production - exactly the same for each virtual cameraman.

It is very useful and therefore, in addition to the [Camera](#) tab, you also have a possibility to switch between the default camera shots ([Camera_1](#) to [Camera_4](#)) at the top of the screen, next to the [View Perspective](#) icon. See the picture below.



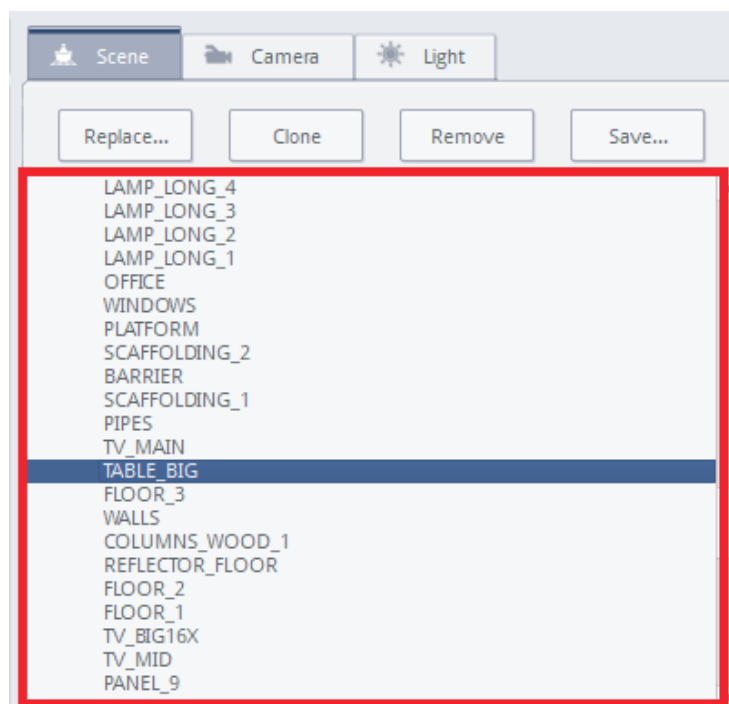
This allows you to switch between the shots while working in the [Scene](#) or the [Light](#) tab, and to monitor on a regular basis how the changes introduced in one camera view look like in another one. See the picture below



For the ease of use, there is also a possibility to work with objects in the [Camera](#) tab - you just have to switch to the [OBJECT](#) mode with your mouse. However, it's a [SCENE](#) tab which was especially designed for this purpose and so it has more options for editing the objects.

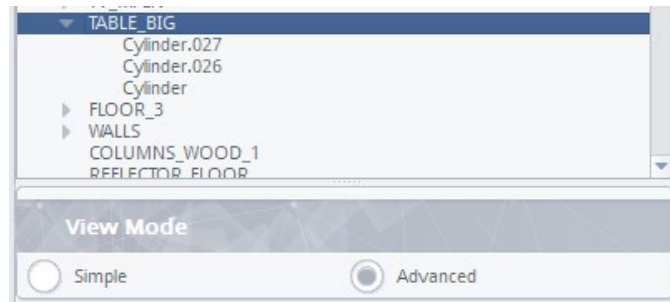
SCENE TAB

In the [Scene](#) tab, below [Clone](#), [Remove](#) and [Save...](#) icons there is a tree with all the objects in the studio. See the picture below.



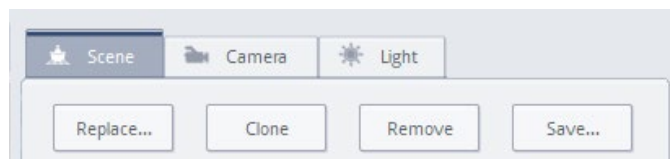
If you have a problem with selecting an object on your screen, for example, because it is obscured by another object located closer to the camera, you can select this object from the list. The object is highlighted in red on the screen then, and its **3D Gizmo**, with which the object can be edited, appears.

A list of all the objects in the studio can be displayed in two modes. You can see the **objects tree** in a **Simple** mode in the picture above, with a **list** of whole objects created by the studio designer. When you **enable** the **Advanced** mode for the selected object (e.g. desk_background), you will be able to see its components. Picture below.



If you are working in the **OBJECT mode**, that is you have an object selected and highlighted in a studio, you will see additional icons above the tree: **Replace**, **Clone**, **Remove** and **Save...**.

As shown below.



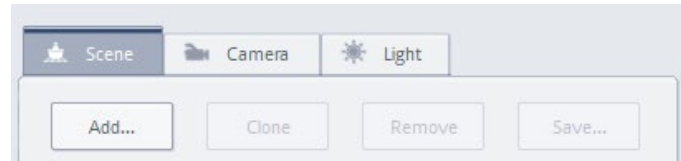
Replace - allows you to swap objects. We can, for example, replace the desk object on the stage to another desk. The new object will be exactly in the place of the previous object.

Clone - (enables cloning the highlighted object) - it adds a clone to the bottom of the list, and places a new object in the preview window in exactly the same location as the original. You have to move the cloned object in order to see that there are, in fact, two identical objects in the studio.

Remove - allows you to delete the highlighted object.

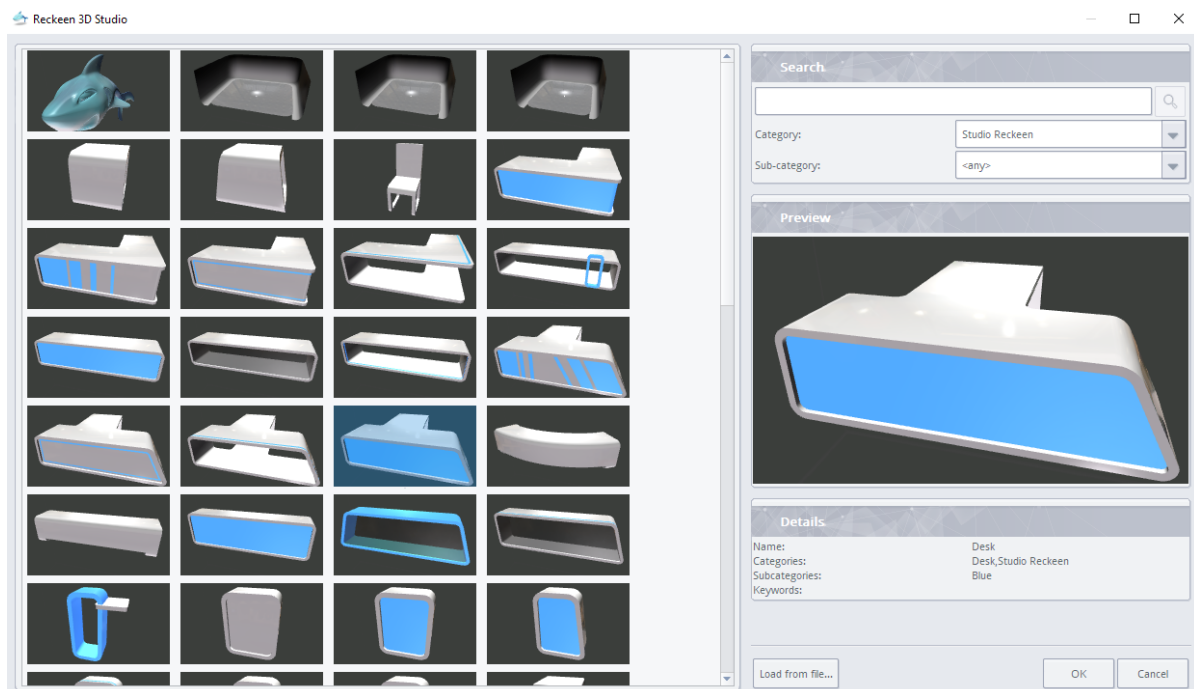
Save - allows you to save the selected object in a directory on your hard drive. If, for example, you like the studio ceiling or its another element, you can save it on your hard drive and use it in another studio project. In order to load the object, you have to go to **CAMERA** mode of the mouse. Then the

Add - icon will appear on the screen in the place of icons: **Clone**, **Remove** and **Save**. The appearance of the **Add** icon can also be called by clicking [**Scene**] on the tree with a list of all objects at the very top of the list. See the picture below.



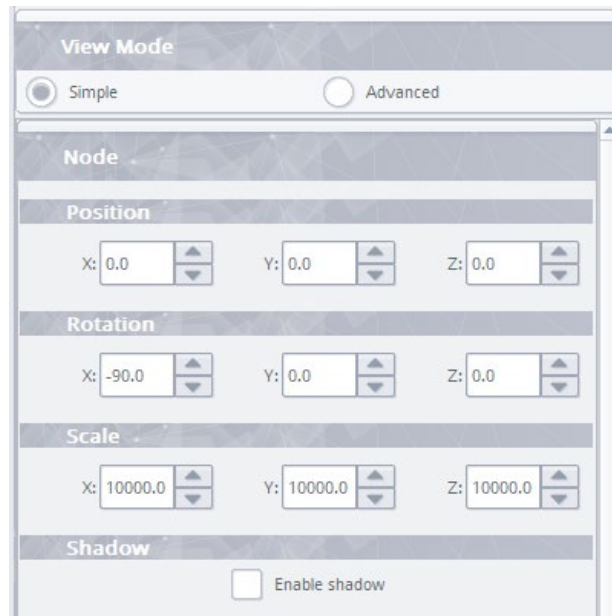
After pressing ADD button... a window with available objects in the Reckeen system database is displayed. It allows you to view an object when you select its thumbnail. On the right side, you will see full information about the object and its location. It is possible to search for an object by typing in first three characters or by using categories and sub-categories. If you want to add an object to the set design that is not in the database, just press "Load file" button and then select an appropriate file from the disk.

You can load objects from files: ***.recNode** (the Reckeen 3D Studio system's own object files) , ***.obj**, ***.fbx**, ***.3mf** (external programs' files like [Microsoft Paint 3D](#)) and ***.recSet** (the Reckeen 3D Studio system's own studio files).



Node section

If you select an object in the studio and it highlights in red, a **Node section** will appear in the **Scene** tab below the **View Mode** section, along with its subsections: **Position**, **Rotation** and **Scale** (picture below).

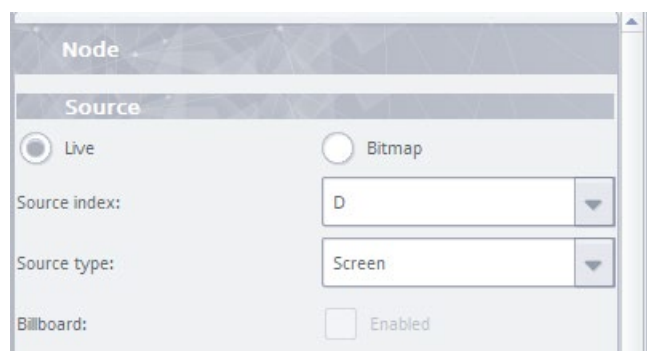


These subsections show accurate numerical values of the studio object's settings in the subsequent modes that can be selected at the top left of the screen: [Move](#), [Rotate](#), [Scale](#). Picture below.

Changes in the object can be also precisely set by clicking up or down white arrows on the right side of the displayed values. You can also enter your own numerical values of the object's settings. To do this, select the numeric field with a cursor, so that the value highlights in blue, and enter the correct number on your keyboard.

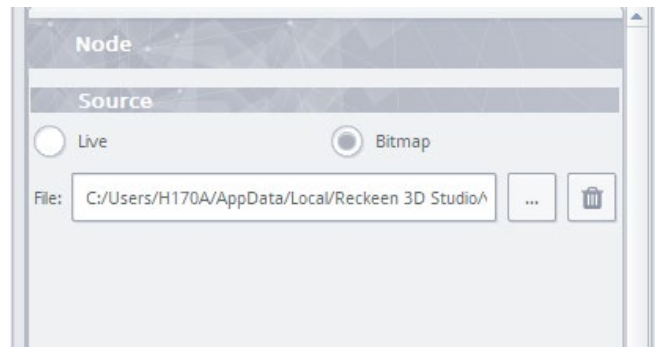
If the object you have selected in the studio is a [Talent](#) or a [Screen](#), then you will see an additional subsection [Source](#) in the [Node](#) section

These are the objects for which you can change the sources with the [A, B, C, D mixer](#) on the [3D Production](#) screen, when the [Live](#) option is selected, as shown in the picture above. See section: Selection of signal sources [A, B, C, D](#).



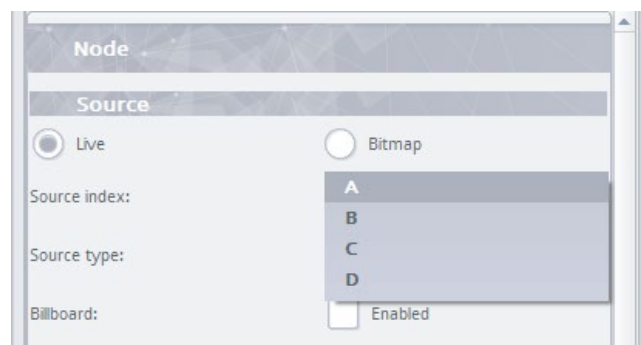
If you select the [Bitmap](#) option, it means that you will not use the [A, B, C, D mixer](#) in the project of your studio, but rather place an image as a source instead. For example, if you have a couple of screens in the studio, you can put different images on some of these screens with the [Bitmap](#) option, and a movie or a camera feed on one or a few displays with [Live](#) option. If you cannot select a single display screen in the [Simple](#) mode, as all the screens were grouped together by a graphic designer, you should use the [Advanced](#) mode.

Clicking on the icon with [three dots](#) will allow you to upload an image file from your hard drive. The path to this file will be displayed in the window. As shown below.

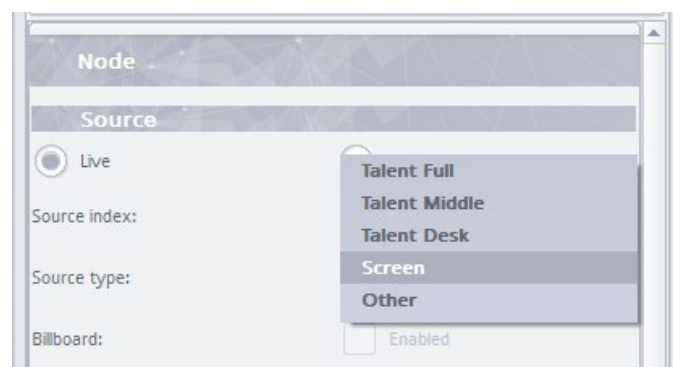


Click on the [bin](#) icon to clear the window.

To set the [Source index](#), click on the drop-down menu and select the index type: [A](#), [B](#), [C](#) or [D](#). Then, what you have previously assigned to the sources [A](#), [B](#), [C](#) or [D](#) in the mixer, will be shown in the studio. See section: Selection of signal sources [A](#), [B](#), [C](#), [D](#).



To set the [Source type](#), click on the drop-down menu and choose the [type](#). See the picture below.



- [Talent Full](#) - the Talent type - a view of the whole figure,
- [Talent Middle](#) – the Talent type - only the upper half of the figure is visible,

- **Talent Desk** – the Talent type - a figure sitting behind the desk,
- **Screen** – a screen view,
- **Other** – a view specified by the user,

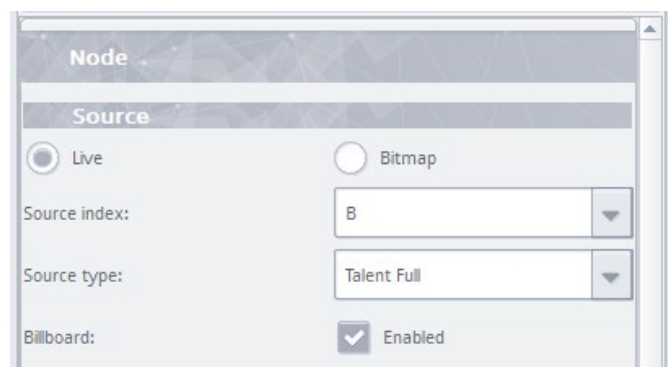
You should take into account that if you have multiple Live sources of the same index (e.g. there are several **A objects** in the studio at a time), then changing the **Source type** of one of them (e.g. **Talent to the desk**) will automatically result in changing the type of all the instances of **A**.

The **Source type** function places an appropriate image on a studio miniature. You will be able to see it in the shot's preview in the production module. For example, if the studio designer envisaged that a source of the **Screen type** will be placed in a given location, then you will see a green graphics on the studio miniature. You will also be able to see a Talent figure in a position behind the desk on this miniature, if the Talent has been placed so. This facilitates operating the **A, B, C, D** mixer. See the picture below.



BILLBOARD FUNCTION

This function is very useful in the case of a **Talent object**. Picture below.



When you **enable** this function, the Talent will always be positioned 'facing' the camera, regardless of the shot. The camera will always point at the Talent at a right angle, as the **Talent** will rotate around a vertical **axis Y**. This way, a situation where the camera 'looks' at the Talent from the side, seeing only a vertical line, will be avoided.

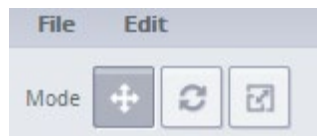
Below the BILLBOARD checkbox you can also find ENABLE HIDE option. It is used to completely turn off a source of A, B, C, D type from a studio without the need to remove the object itself. The studio's author can provide in the project possibilities of placing, for example, a form of a talent in various places in the studio. Using them all at once in one frame is not possible, so such source can be switched off for a while.

You have to be careful in the case when the Talent figure stands close to some other object, like to a desk, not to move into it when turning around. The picture below.



In such case, you should increase the distance between the Talent and the object, or even remove this object from the studio. Graphic designer can disable the [Billboard](#) function for the Talent in their project and in this situation you need to save the studio in a new file to change this.

MOVE, ROTATE AND SCALE MODES



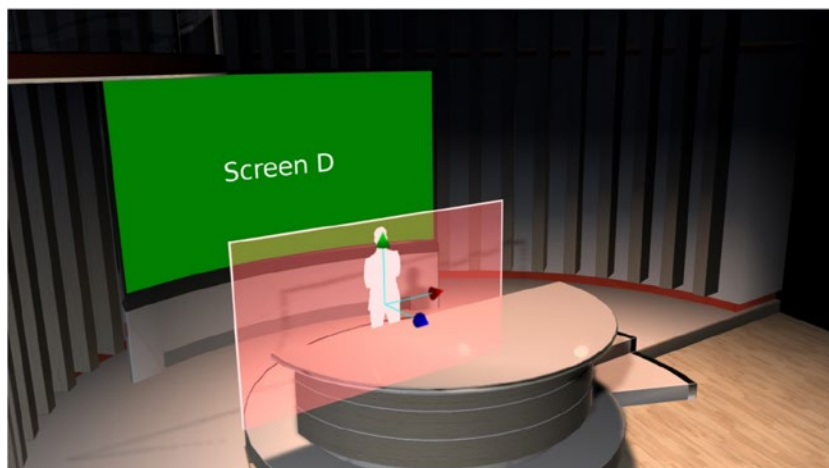
Mode icons are placed in the upper right corner of the screen. Let's start with a [Move](#) mode.

Each mode has its own [3D Gizmo](#) type which appears when you select an object.

To make the user's work easier, shortcuts [ALT + Q](#), [ALT + W](#), and [ALT + E](#), allowing you to quickly switch between different [3D Gizmo](#) modes, have been defined.

When you select the object, it highlights in red and the [3D Move Gizmo](#) appears.

See the picture below.

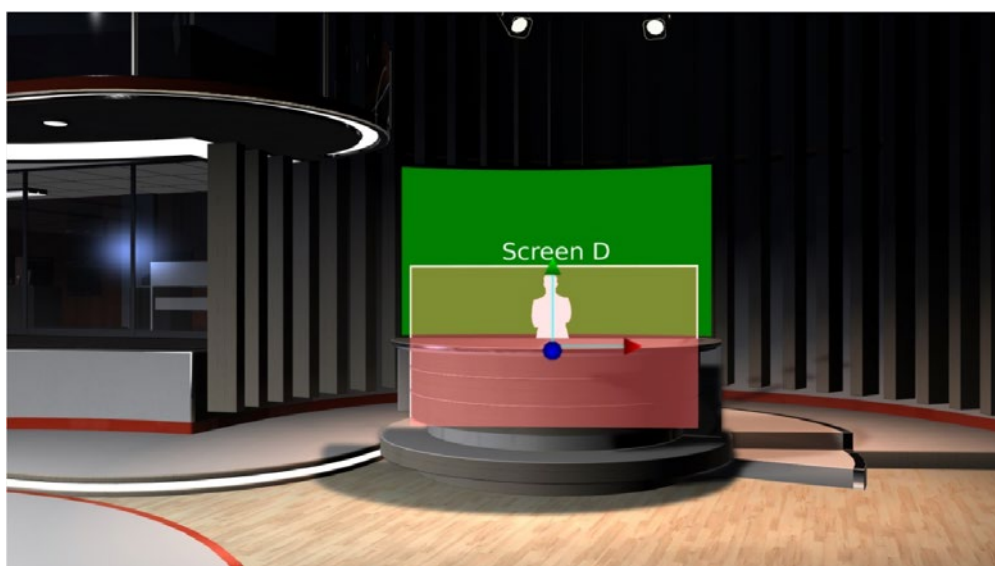


If you hook the mouse cursor on any of the arrows, you move the object in that direction. The currently used arrow highlights in **yellow**.

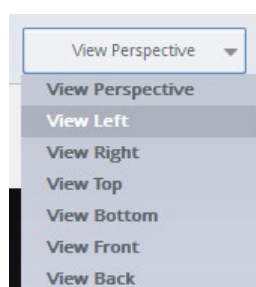
When you move the cursor into the **3D Move Gizmo**, you will find a place where all 3 arrows light up. You can change all values at once with the mouse cursor there, that is move the object in all three directions. However, it is easier to set the object's shifts in successive axes.

Setting the shifts in some axes may prove particularly difficult or even impossible with various objects due to the lack of appropriate view.

Imagine that you want your talent to move from the desk to the front. When the camera faces straight at the Talent, you will not see the **Z axis** at all. As shown below.



However, you can change the camera view perspective with the drop-down menu at the top right side of the screen. Let's choose **View Left**. Picture below.



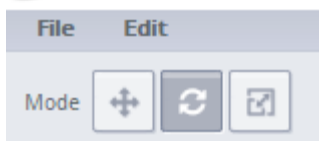
In this view, the **Z axis** is clearly visible, which allows for accurate positioning of a shift in this axis. Pulling the Talent forward from behind the desk, you can precisely set the position in the **Z axis**, and also the height in the **Y axis**.

See the picture below.



In the [Position](#) section of the Settings, you can see the values showing the exact location of the object inside your studio. Figures are given in centimeters and refer to the zero point set by the studio's designer.

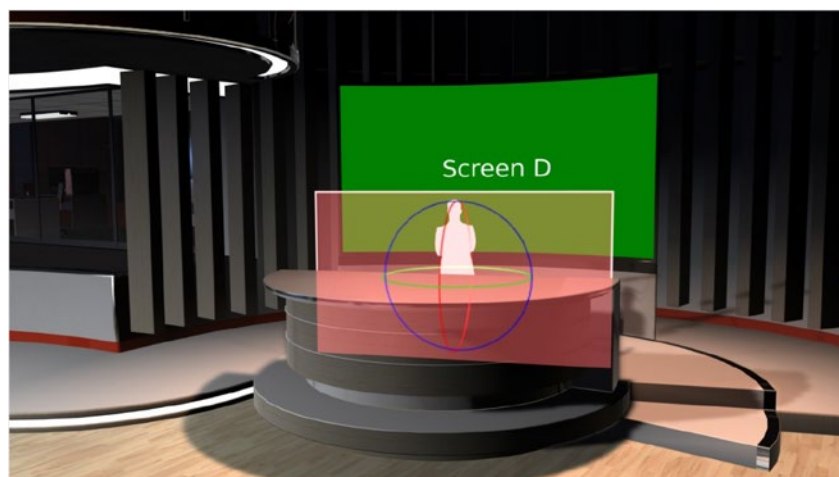
Reckeen 3D Studio



Let's enable the [Rotate](#) mode now.

Select the [object](#), it will become highlighted in red and [3D Rotate Gizmo](#) will show up on it.

Picture below.



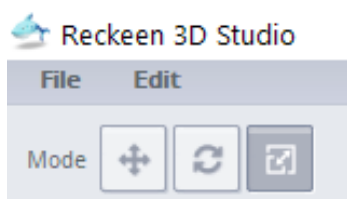
If you hook the mouse cursor on any of the circles, you can rotate the object. The currently used [circle](#) [highlights](#) in [yellow](#).

When you move the cursor into the [3D Rotate Gizmo](#), you will find a place where all 3 circles light up. You can change all the values at once with a mouse cursor there, that is rotate the object in all three directions. However, it is easier to rotate the object with movements on successive circles.

Just as before, you can take advantage of additional views from different camera angles, if setting any of

rotations proves to be particularly difficult.

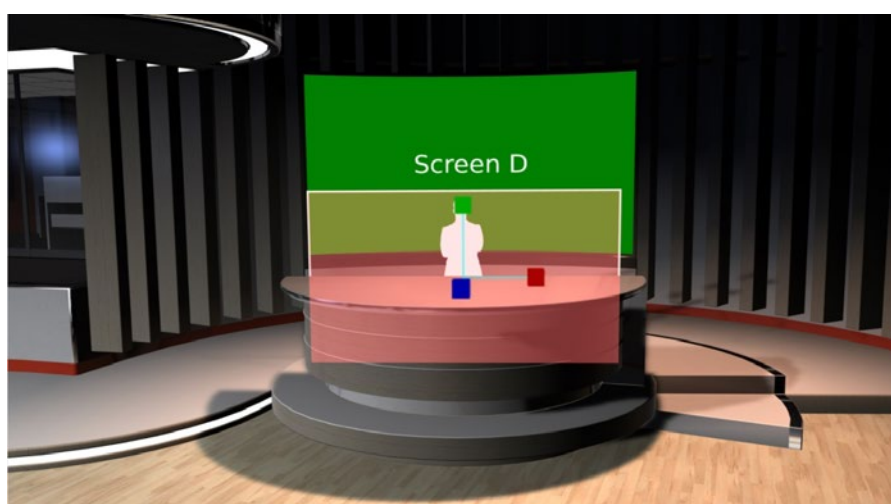
In the [Rotation](#) section of the Settings, you can see numerical values showing the angles of the object's rotation in the studio. The figures are given in degrees.



Now, let's enable the [SCALE](#) mode.

See the picture below.

Select the object in the studio, it will become highlighted in red and [3D Scale Gizmo](#) will show up. Picture below.



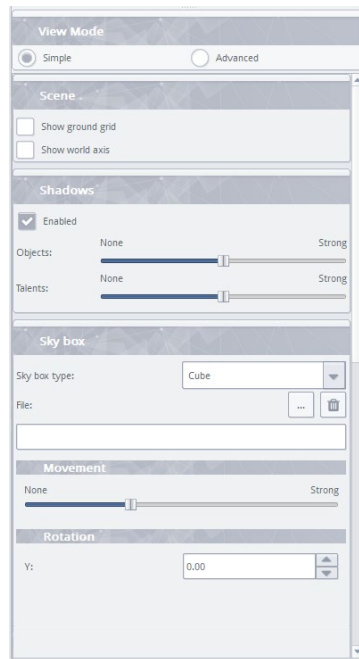
If you hook the mouse cursor on any of the cubes, you can increase or decrease your object in this direction. The currently used axis with a cube highlights in yellow.

When you move the cursor into the [3D Scale Gizmo](#), you will find a place where all 3 axes with cubes light up. You can change all values at once with the mouse cursor there, that is change the object's size in all three directions. However, it is easier to set the object's size in successive axes. Flat objects, such as Talent, can be enlarged or reduced in size in [X](#) and [Y axes](#), but there is no possibility of "stretching" it in the [Z axis](#).

Also in this case, you can take advantage of changing the perspective to get the right view helping you to set the changes in the object correctly.

SCENE SECTION

When you leave the Object mode in the [Scene](#) tab, that is the [red](#) highlight of the object disappears, then the [Scene](#) Section switches on below the [View Mode](#) section, with the following options: [Show Ground Grid](#), [Show World Axis](#), [Shadows](#) and [Sky Box](#). As shown below.



Shadows - Selecting enabled allows you to turn ON shadows in the studio, both for objects and for talents. For more see chapter “Shadows” below.

The Show [Ground Grid function](#) - enabling this feature will result in displaying a grid on the studio floor, which will facilitate objects' positioning. Grid squares have sides with a length of [100 units](#), that is [1 meter](#).

The Show [World Axis function](#) - switches on an additional [3D Gizmo](#) for the studio. This [3D Gizmo](#) shows directions in the studio all the while making the orientation easier. Picture below.



The [SkyBox function](#) - it is an additional function for creating objects, a method that enables adding [*.dds](#) files to the studio project - that is, typical files simulating the space outside the studio depending on camera angles. This will be the most distant space, often completely outside the studio. You have several types of [SkyBoxes](#) at your disposal: 'Cube' (default) – [*.dds](#) files, 'Cylinder' – bitmap files ([*.png](#)., [*.jpg](#), [*.jpeg](#), [*.bmp](#)) , 'Sphere' - ([*.png](#)., [*.jpg](#), [*.jpeg](#), [*.bmp](#)) and 'Sphere reflect' - ([*.png](#)., [*.jpg](#), [*.jpeg](#), [*.bmp](#)). These files contain a flat image, which can be applied on the [SkyBox](#) of a given type, yielding e.g. a three-dimensional view of the sky.

Sky box type: Cube

After loading a Cube type Sky Box, you can set the following image parameters:

Movement - this parameter simulates bringing a SkyMap closer to the studio and moving it away. You can observe how the SkyMap move. When you are creating a set design, you can use a measuring instrument that will show current overall performance of the Reckeen system. You can turn this function on with a button in the Studio Editor (see the image below).ing the slider on a range from None to Strong.

Rotation - by default, values for this parameter are assumed in degrees from 180 degrees to (minus) -179.99 degrees. When the SkyMap file is loaded, this parameter is set to 0. Entering further Rotation values will make the SkyMap rotate on its axis to the right or to the left. If you type in '180', then the SkyMap will turn around and an initial view will be placed exactly behind the camera directed straight ahead towards the studio.

Sky box type: Cylinder - space around an observer is created by wrapping a flat image on a cylinder. After loading Cylinder type Sky Box, you can set the following image parameters:

Offset - controls the SkyMap's cylinder shifting up / down in relation to your studio's floor. Negative values shift it down, positive values up. Values are assumed by default in % and the maximum value is 100%. At 100% your cylinder is shifted up to the top and its bottom edge is at your studio's floor level. At (minus) -100% the SkyMap's cylinder is shifted totally downward and its top edge is at the floor level of your studio.

Scale - adjust the 'wrapping' of the loaded cylinder's image. Values are assumed by default in %. At 100% the cylinder is wrapped without gaps in the image, the image is 100% filled up. Values above 100% will cause the image wrapped on the cylinder to overlay, while values below 100% will result in creating a gap in the image.

Rotation - its default values are set in degrees from 180 degrees to (minus) -179.99 degrees. If the parameter is 0, the camera standing in the studio and pointing straight ahead 'sees' the center of the image. By entering the next Rotation value, you will rotate the image on its axis to the right or to the left.

Note: Sides if images to be displayed as panoramas on cylinders should have multiples of 1024 as their lengths in pixels: 1024, 2048, 4096, 8192, 16384

For example: files with resolutions: 8192x2048, 8192x4096, 16384x2048

Files with other resolutions may be displayed in inferior quality or may slow down the system.

In the case of a Cylinder type SkyMap, you have to be careful about reflections in the studio. It may happen that a glossy floor reflects the 'top' part of the cylinder, which is, in fact, an empty hole, resulting in the unnatural look of the studio's floor. It is not a case with Cube, Sphere or Sphere reflect types of Sky Boxes that fill the whole sphere.

Sky box type: Sphere - this type of SkyMap requires .jpg files, but specially prepared. Some cameras can take this kind of panoramic pictures. After loading this file, a full sphere is created around the studio.

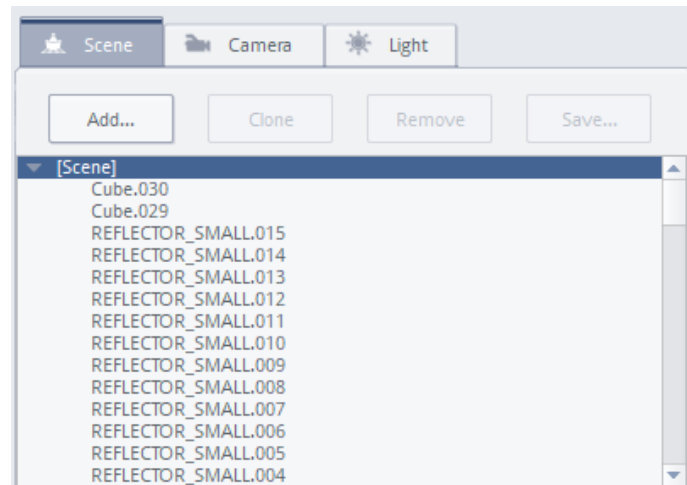
When you load a Sphere Sky Box, you can set the same image parameters as with the Cube.

Sky box type: Sphere reflect - just like with the Sphere files, this type of SkyMap requires .jpg files, but specially prepared. You can get such panorama files by using certain cameras or by preparing them by a graphic designer. After loading such file, a full sphere is created around the studio.

After loading the Sphere reflect type Sky Box, you can set the same image parameters as with the Cube.

SHADOWS

To enable shadows in the studio, first you have to select the first item, [Scene], which covers the main set design's settings.



You can find "Shadows" position below the objects tree. After checking the function: Enable shadows, additional options for adjusting shadows' density are displayed.

To adjust shadow's density, use a slider with values ranging from NONE to STRONG.



The first parameter applies to the shadows cast by all the objects in the studio for which Enable shadows option has been checked. The second parameter applies to all the Talent type objects. With a slider, you can set a shadow that is more transparent (NONE) or has higher distinctness (STRONG). The example is shown in the image below.



Shadow parameters for objects will depend on the lights' settings in the studio, while talent type shadows do not depend on the light settings and are always generated after the Enable Shadows function on a specific Talent type object is checked.

If you are using a ready-made set design, first you select an appropriate Talent type object. If you are creating a new set design, it can be added with ADD button. An appropriate talent thumbnail appears.

The most important thing is to ensure that a contour edge of a field where the talent figure is located was situated just above the floor, under no circumstances penetrating it.



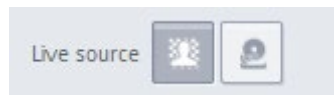
Select the object with a mouse so that it was highlighted in red. The parameters of this object will be displayed on the right side of the screen. Find "Shadows" field.



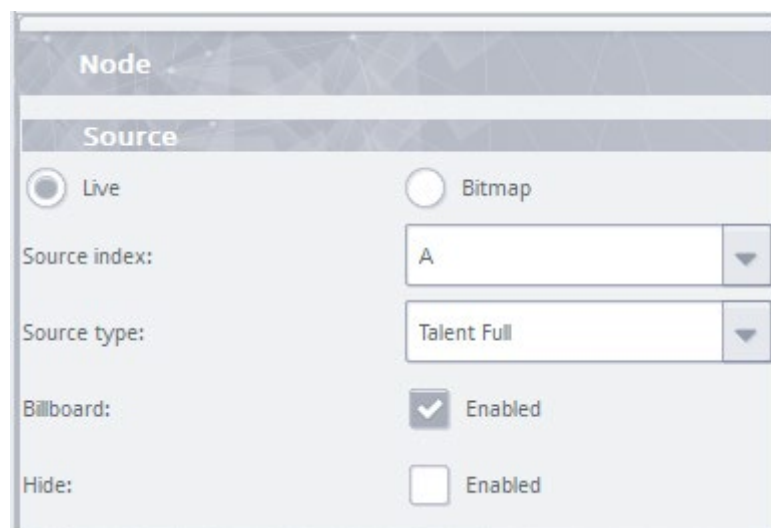
When you check Enable Shadow option, you enable a shadow for this object.



To set the shadows' parameters more precisely, it is suggested to set them on a live source.



For example, if you select this object, you will notice that this source is set with A mixer, as indicated by the Source index parameter.



Therefore, just set any input from a camera, CAM 1 for example, on the Production module's mixer.



You will get on the screen a live image from the camera.



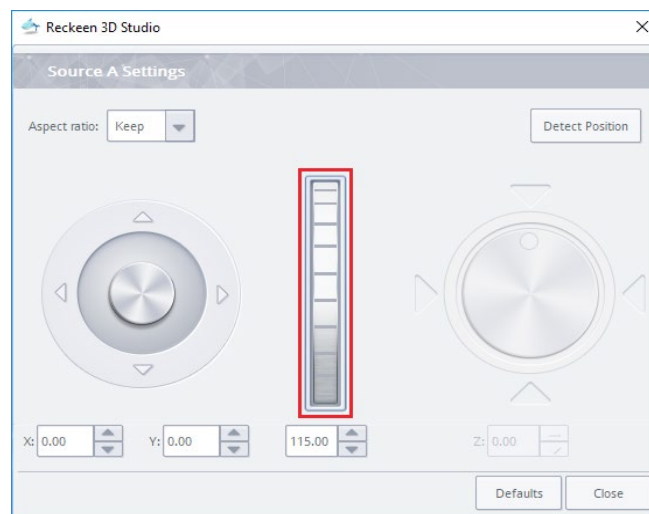
Now the live image from the camera should be subjected to a chromatic keying procedure described in the “Keying” section.



The figure's size should be properly adjusted to the chosen set design in the part of the mixer A, where the live source from the camera 1 had been previously selected. It is done with the use of gears settings button located on the right side of the buttons. The image below.



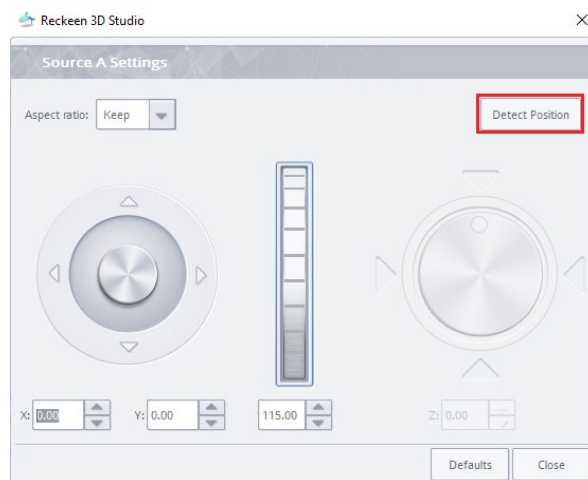
After pressing the button, the size of the talent can be adjusted by using a scale knob in a window that appears. The image below.



The achieved effect will be as demonstrated in the image below.



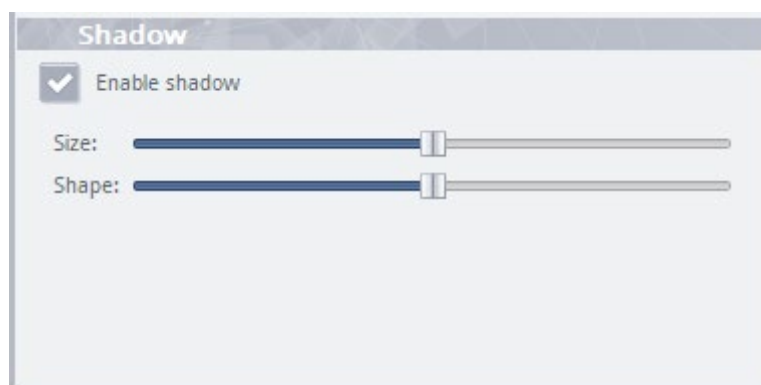
The next important step is to use DETECT POSITION button, with which you will automatically pin the talent's form to the floor and adjust its shadow. The image below.



The effect of using this function will be just like in the image below.



After selecting the object so that it was highlighted in red, it is possible to adjust a shadow to better fit the figure with the help of sliders.



The first parameter - Size - relates to the radius of the shadow. With the help of the second slider -Shape- you can define the shape of the shadow that is cast.

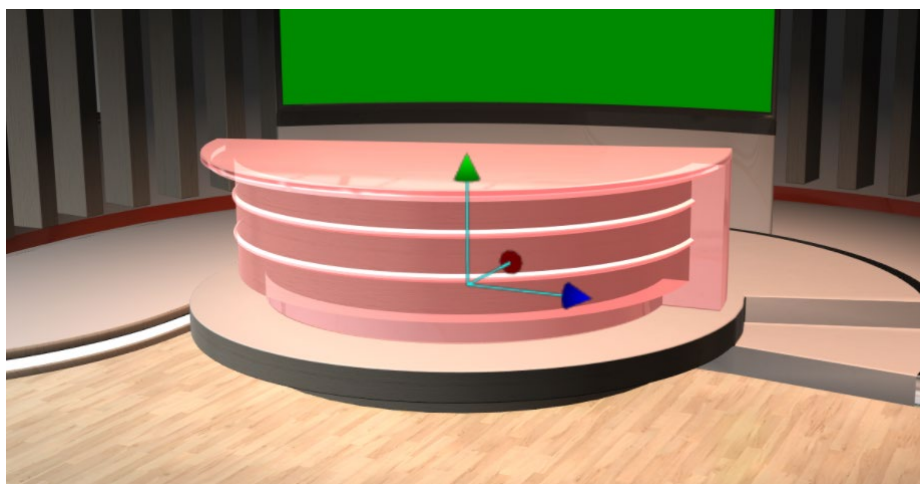
Now it is possible to set an appropriate shadow density (None, Strong) with the main shadow parameter ([Scene]).



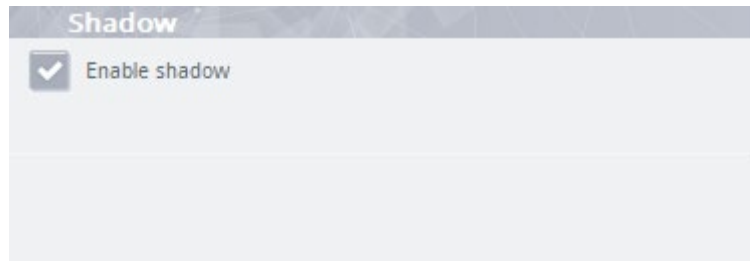
The image below depicts the final result of using size, shape and shadow density functions.



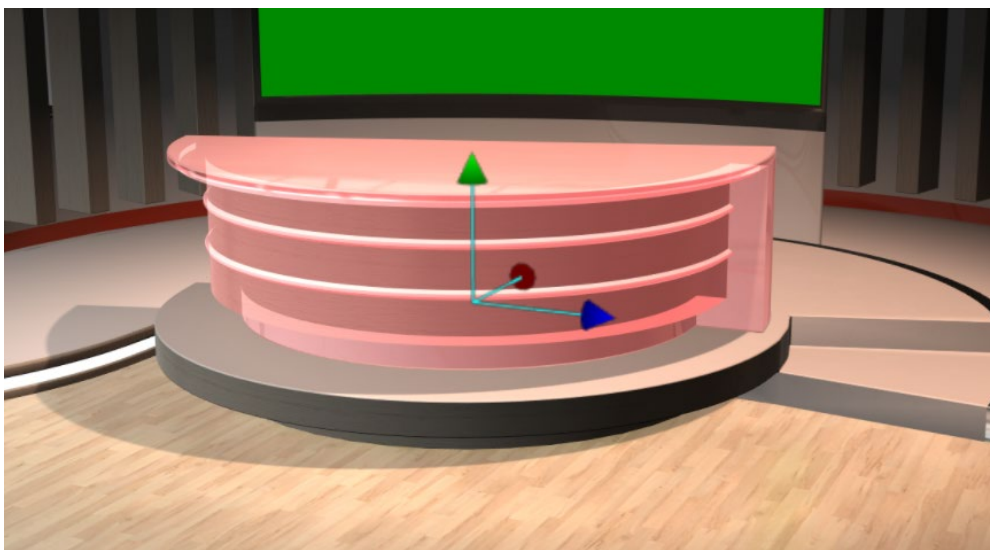
In the case of non-Talent objects, you select an object so that it becomes highlighted in red.



On the right side, you can now see a Shadow parameter along with Enable Shadow option. With this option you can turn on the shadow for a given object, if the lighting conditions are met, i.e. an appropriate type of light is used, Spot for example.



You can set an appropriate density of the object's shadow by using the main ([Scene]) parameters.



General rules for enabling shadows:

If you want to use shadows, you have to take into account the fact that they require additional calculations done in the system and, what goes with it, an increased use of graphics memory.

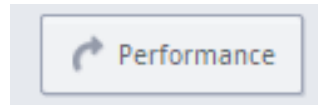
You should enable shadows only for those objects that are clearly visible on the stage and are of particular importance to the final viewer. If there are objects in the set's background that are barely visible or that do not participate in the main thread of the camera, they do not require shadows. It is not recommended to enable shadows for large objects, i.e. entire large external studio wall, ceiling or floor (such objects do not create shadows in the natural studio environment). For the objects that are not illuminated by any lights, i.e. Direct or Spot ones (as only these types of lights create shadows), there is no need to enable this function. In addition, fully transparent objects also do not create shadows.

It is suggested to pay attention to whether you enable a shadow for an entire group of objects, e.g. for a desk, and not just for one of its legs.

PERFORMANCE function is used for overall evaluation of the scene performance, its description can be found in one of the following parts of the manual.

PERFORMANCE

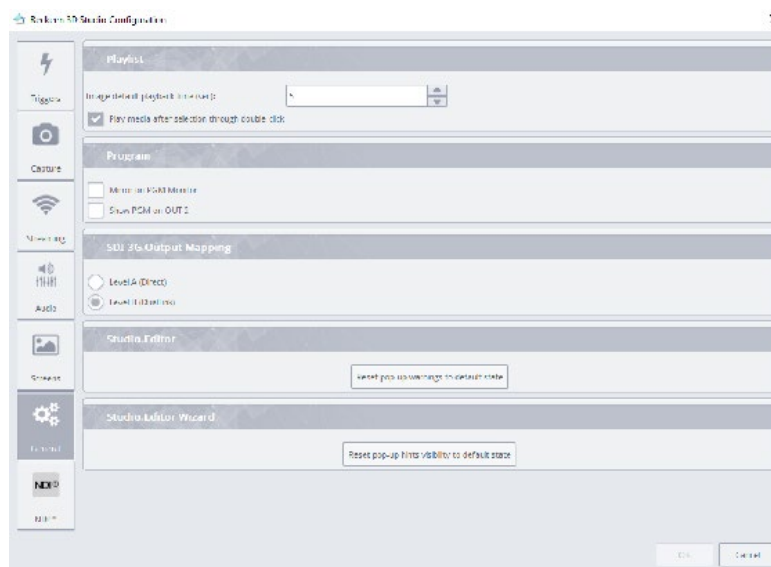
When you are creating a set design, you can use a measuring instrument that will show current overall performance of the Reckeen system. You can turn this function on with a button in the Studio Editor (see the image below).



For better accuracy of measurement and evaluation, it is suggested to choose an output format in which you intend to work and to connect the appropriate number of inputs.

The evaluation of system performance depends on many factors, i.e. video input, format of files in video and graphic trays, sequences used, enabled DSK layers, etc. Therefore, the indicator provides some approximation of performance evaluation. During the measurement it is suggested to include the largest area of the studio possible in the stage camera's view, but still as if it was done working on the air.

When this function is activated, the main mixer's PROGRAM and PREVIEW will be switched for a while, so it shouldn't be used during live operation. You will be informed about that with a message. If you don't want to see this message again while launching the function, check an option: Do not show this window again. If you want to see the messages again, in the General / Options settings press a button: Reset pop-up warnings to default state. Picture below.



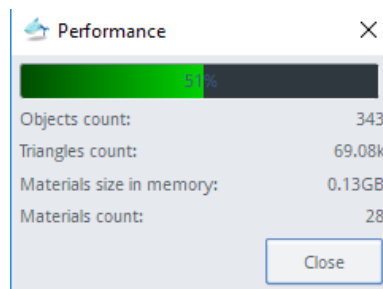
After you accept the button, a progress bar will appear with its respective colors and percentage of system usage under given conditions. See the description below.

Performance is depend on many factors (not only number of triangles) in objects:

- Set complexity
- number of triangles,
- number of objects,

- materials,
- texture resolution.

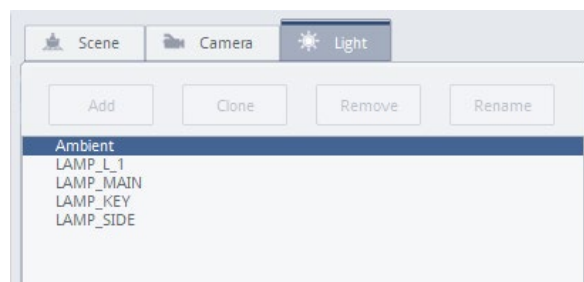
Performance colors:



- Green performance (to 70%) counter means that set is properly prepared and optimized. Can be used without any problems.
- Yellow color (from 70% to 90%) means that set is quite heavy and very rare with very heavy system overloading can produce jerks,
- Red color (above 90%) means that set is too heavy and should be better optimized or complexity should be reduced.

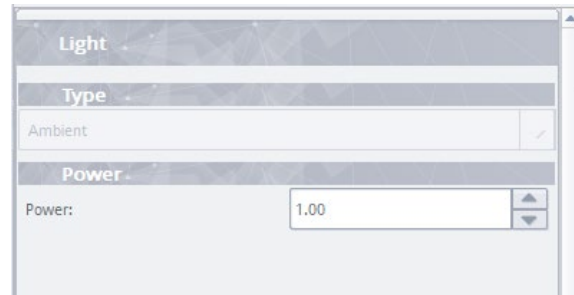
LIGHT TAB

In this section, properties of studio lights are being defined. You can change the parameters of these lights, turn them on and off, change their color, direction and positioning in the studio. You cannot, however, add or clone new lights. For that reason, these buttons are dimmed. Picture below.



There are the following types of lights in the studio:

Ambient - a type of light that fills an entire studio and illuminates all the objects evenly. **Ambient** light does not come from any particular direction and it falls on all the elements of 3D scene, helping you lighten or darken them. Picture below.



You can only set the power of this light. If you enter a 0 value in the Power field, the light will be turned off. The maximum brightness Ambient light reaches at 2.00

To make it easier for the user to set the lights, when the Light tab is turned on, different types of lights will be represented by different objects that appear in the studio. This allows you to rotate and move these objects and thus control the direction of light and its location.

Ambient light is the only one that will not be represented by any object in studio because it fills the entire studio and you only set its strength.

OTHER TYPE OF LIGHTS



Generally, only 3D Rotate Gizmo or 3D Move Gizmo is available for light objects. The 3D Scale Gizmo is off because it is not possible to increase or decrease a light object. However, you can adjust the color, intensity, or direction of light by using the appropriate light-type controls.

You can choose the following types of lights from the drop-down list: [Directional](#), [Point](#), [Spot](#).

[The Directional light](#) has only a color and a direction parameter. This source emits a parallel light, which means it travels across a stage in the same direction. Sunlight is the best example of such light.

Directional type of light creates shadows for the indicated objects. When directional light is directed upwards, it does not create shadows. Imagine a situation in which a talent figure is illuminated from underneath the floor (light penetrating the floor). The talent object would then cast a shadow on a ceiling, which wouldn't look naturally in the set design. It is possible to lighten up each direction of the studio with Directional light, but it simulates the real world's sunlight type of light, so it casts shadows on the objects below. Because of the system performance, it is best to use only one Directional light. The rest should be of a different type.

Below we see the cone object representing the Directional light source editor in the studio. The base of the cone is the place where the light emits. Where we point the base of the cone in this direction will be the direction of light illumination.

Note that for this cone a 3D Rotate Gizmo appears immediately. Even if you have previously set the 3D Move Gizmo mode, after selecting Directional light from the drop-down list, the Gizmo will be changed to

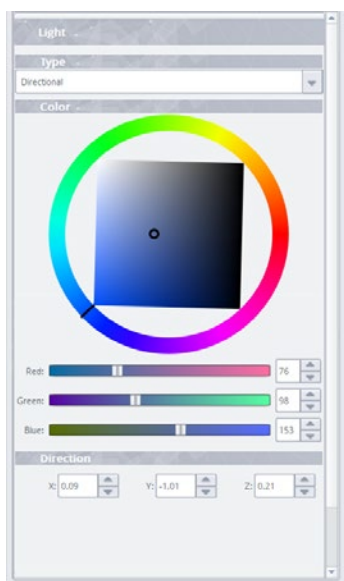
3D Rotate. This is due to the properties of this light, as it has only a color and a direction, and does not have a specific position.

A cone representing this light in the studio is always suspended in the middle of a 'ceiling'.

Directional light has always an object's representation with coordinates $x = 0m$, $y = 3m$, $z = 0m$, i.e. usually at the center of the studio. This position has no effect on the light's final effect, and is intended only to make it easier to be found in the studio for changing its direction with Rotate Gizmo. This means, if you have a different type of light, such as Point, placed anywhere in your studio, then after changing the type of light from Point (which has a position in the studio) to Directional, the position of this light object will remain unchanged only until you save the studio file to the editor. Afterwards, the object representing the Directional light will appear again in $x = 0m$, $3m$ $y = z = 0m$ position in the studio.

With the 3D Rotate Gizmo we can easily set the direction of the light. Remember that our studio also produces light reflections from glossy materials: walls, ceilings, furniture, etc. Therefore, often light reflections can give us additional effects that must be checked by the user. Simply by editing the camera, you can check the random positions of the studio, light as the source (stream glow) does not unnatural reflect in the material.

Color of the light and its intensity can be set with a color wheel operating on RGB (Red, Green, Blue) system. Changing the dash marker's position on the wheel allows you to set the color by changing the color tone parameter. If you hook the cursor on a small circle, you will be able to move it inside the square. Current color will be visible in the middle of the small circle. If you want to turn the light off completely, you need to move the circle to a black area inside the square. The picture below.



You can set the color of the light more precisely by clicking on white arrows next to numerical values.

By changing the color of the light, you also change the color of the object representing light, in this case the cone.

Generally, the 3D Rotate Gizmo is used to set the direction of the light. However, you can precisely adjust the direction of the light with help of the values in X, Y and Z fields in the Direction section.

Light of the POINT type is a spherical kind of light, which illuminates all the objects around it in the studio. In contrast to the type light Direction, this type has attenuation value depending on the distance from the source. The objects are less illuminated the further away they are from the source of light. This light does not have a single specific direction, it shines in every direction. It doesn't make shadows.

The light in the studio will be represented not by the cone but by the ball glowing in all directions.

This sphere (ball) has a specific position in the studio, so it will be important to position it with 3D Move Gizmo.

3D Rotate Gizmo you can also use, if you want to move the ball in some specific direction in the studio and the 3D Rotate Gizmo (arrows) axis are oriented in different directions. You can then rotate the object: the ball, to move the 3D Move Gizmo in the right direction and then move it with the 3D Move Gizmo.

Color of this light can be set in the same way as in the previous case, with the help of the color wheel. If you want to turn it off completely - choose black. The intensity, however, is controlled by the distance of the object Point light from the illuminated object.

Generally, the 3D Rotate Gizmo is used to set the direction of the light. However, you can precisely

adjust the direction of the light with help of the values in **X, Y and Z** fields in the **Direction** section.

Position section.

In the **Attenuation** section you can set the type of attenuation of this light:

- **Constant** - constant light attenuation coefficient,
- **Linear** - linear light attenuation coefficient,
- **Quadratic** - square light attenuation coefficient.

Maximum attenuation of light is reached when entering a value of 2.00 .

If you enter a value of 0 in all the fields, the light will travel in the studio without any attenuation, it will neither be diffused nor weakened with the distance from the source. This will, by removing attenuation, maximize the illumination of this light.

In order to test the performance of these coefficients, you have to make a number of attempts typing different Constant, Linear and Quadratic values, and checking what lighting effects you get in the studio. It is best to start testing at initial values of Constant = 1.0, Linear = 0.5, and Quadratic = 0. Let's observe how the light affects objects in the studio. The further they are away from the light source, the more light dampening is visible.

Basically the three define an equation describing how the light appears at a distance. An attenuation factor is used for describing how a light's intensity diminishes over distance.



The reason the two parameters other than the constant one is called linear and quadratic is evident from the formula: the linear attenuation value is multiplied by the distance (thus we have a linear relationship) while the quadratic attenuation value is multiplied by the square of the distance (giving a quadratic relationship).

Spot type of light - a spotlight type. **Spot** has parameters of color, position in the studio and light direction.

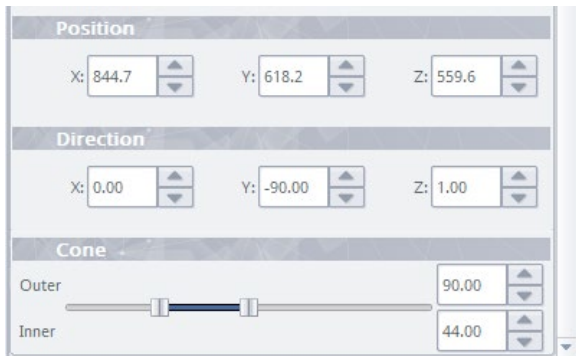
SPOT type of light creates objects' shadows. The most common use of this light is to illuminate a talent form from above. However, you should remember not to set this light's position and direction directly above the figure as the talent area is flat. Most often the light is placed a little ahead of the figure and in a proper direction towards the talent's outline. Then you will get a shadow effect behind the inserted talent. This light should illuminate a group of objects located close to each other, e.g. a desk, a platform and a talent. This type of light should be treated as a single light source illuminating the most important part of the studio, where the main production thread is located.

Light emitted from a spotlight is made up of an inner circle (representing the light source without dampening and adjustable with the INNER value) and an outer circle (the intensity of which is getting increasingly dampened and being regulated with the OUTER value). The light intensity decreases moving from a bright center to a darker outer contour. The light's color is set as before - with a color wheel. Choose black if you want to turn the light completely off.

Spot light is also represented by a cone object. The cone can be placed anywhere in the studio and pointed in any direction. Therefore, use the 3D Rotate Gizmo to set the direction of the Spot light and the 3D Move Gizmo to adjust its position in the studio.

In addition to setting the spotlight with the 3D Move Gizmo, you can make accurate and precise changes in the light's position in the studio using the X, Y and Z fields' values in the Position section. What's more, you can introduce accurate and precise changes to the direction of light, previously set using the 3D Rotate Gizmo, with the X, Y and Z fields' values in the Direction section.

In the Cone section, set Outer and Inner values. A value of 150 (expressed in degrees) is the maximum angle of this cone. The picture below.

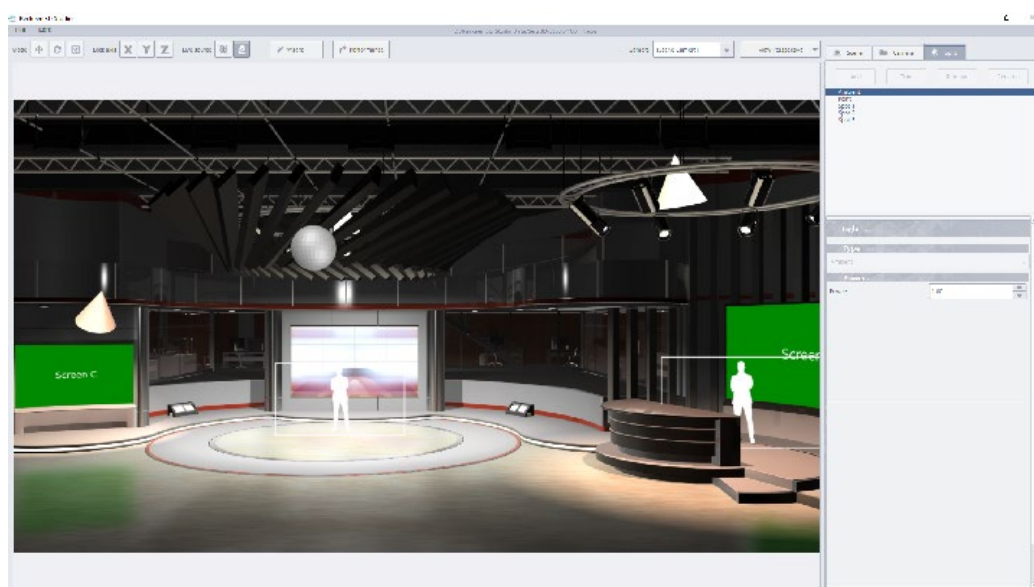


If you set the same values in Outer and Inner fields, you get a spotlight cone with circle of a very sharp boundaries. The further the Inner value is away from the Outer value, the fuzzier boundaries the spotlight will have.

Most often, in the studios' projects you will find already pre-set different types of lights. But it may happen that in the studio's project prepared in the Wizard, you will have to select and set your own lights as the Default lights have been selected.

LIGHTS ON SCENOGRAPHY (EXAMPLE USAGE)

To best understand the whole idea of building a set design, illuminating it and creating shadows, it is best to use an example of a default "News" studio, which is loaded first during default launch of Production 3D. In this studio, AMBIENT type of light has been used to slightly illuminate the scenography. In addition, there is one POINT light to illuminate the elements in the background (elements of the studio's backup facilities) as the intensity of light depends on a distance from its source. Therefore, the elements that are really far back don't need such strong light. Since there are 3 talent figures in the studio that may take part in the camera's production thread, each of them has a separate SPOT light assigned with its appropriate INNER and OUTER cone settings. This stage design is not only properly lit, but also its performance requirements are not high. Picture below.



TOOLBAR - FILE OPTION

There is an [File](#) option [on the toolbar](#) available at the top left side of the screen. You can choose functions from the drop-down menu.

[File-> New](#) – You start the editor work from scratch. If you have any studio loaded, selecting this function will cause all of the settings to be lost.

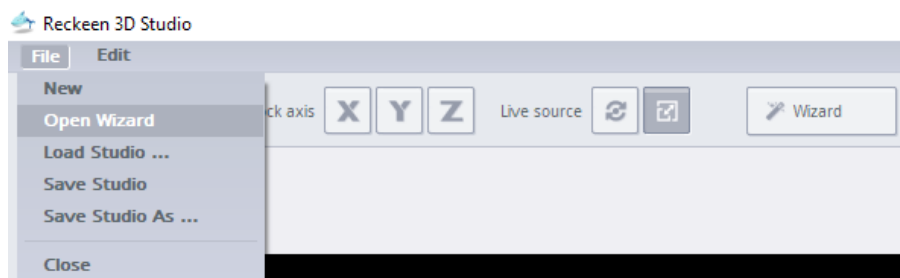
- [File->Open Wizard](#)
- [File >Load Studio ...](#) - opens a studio file with a previously saved project.
- [File >Save Studio](#) - saves a current project file.
- [File >Save Studio As ...](#) - saves a current project in a file under a different name.
- [File >Go to Startup](#) - takes you to the start screen

If we choose the option [File- Open Wizard](#) , we go to [Wizard](#).

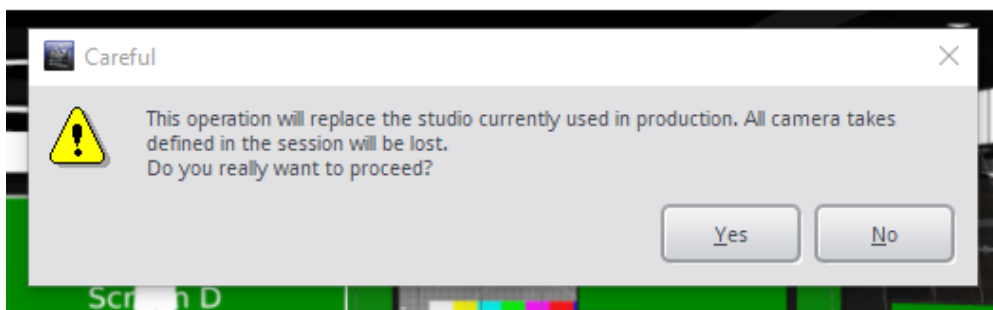
WIZARD

It should be noted at the beginning that you shouldn't work in the [3D Editor](#), or the [Wizard](#), during the live broadcast.

Click [File > Open Wizard](#) in the opened [3D Studio Editor](#) window or press the [Wizard icon](#) on the bar.

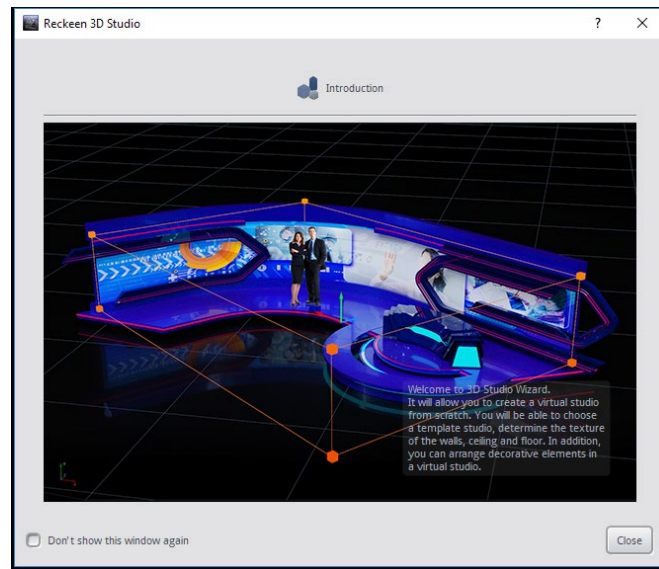


Then, a warning appears, stating that in the case the new camera takes were defined during the ongoing session, the results of the work might be lost (message window below).



If you want to keep your previous work in the [Production](#), it's best to [click NO](#) to go to the [Production module](#), save the session there and run the [Wizard](#) again. [Click YES](#) only after completing those steps.

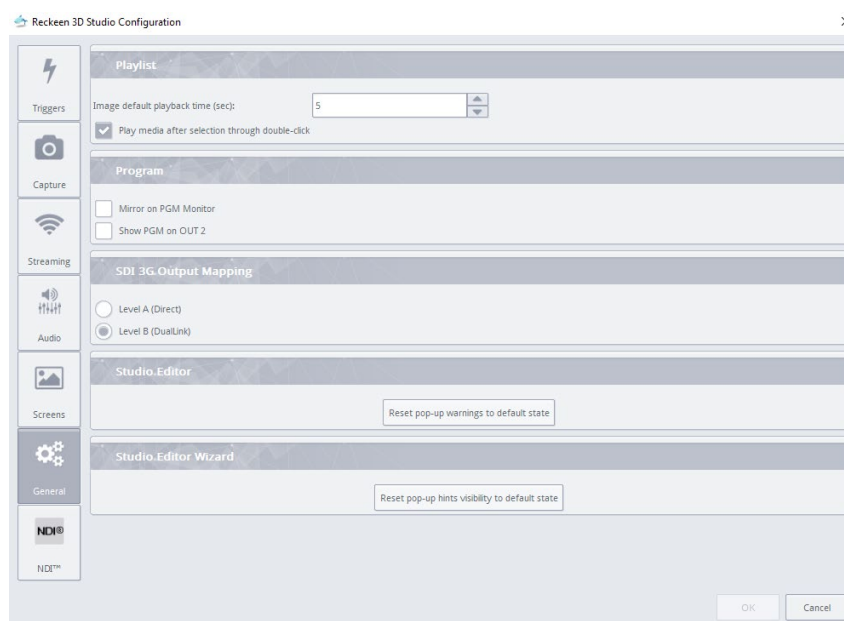
The first one of the pop-up window series will appear. It will guide you through the Wizard. (Picture below).



If you tick the option: Do not show this window again, the window will not appear the next time you open the Wizard. The same can be done to all the windows that appear in the Wizard. Once you leave the Wizard, you can save changes to your session on the [production screen](#) ([File> Save session](#)) or [create a new session](#) ([File> Save Session As...](#)). Afterwards, when you re-enter the session, the pop-ups will not appear in the Wizard again.

However, if the pop-up hints still facilitate your work, you can enable them once again by clicking on the production screen:

[Options> Configuration> General> Wizard Studio Editor>](#) Reset pop-up hints visibility to default state (picture below).

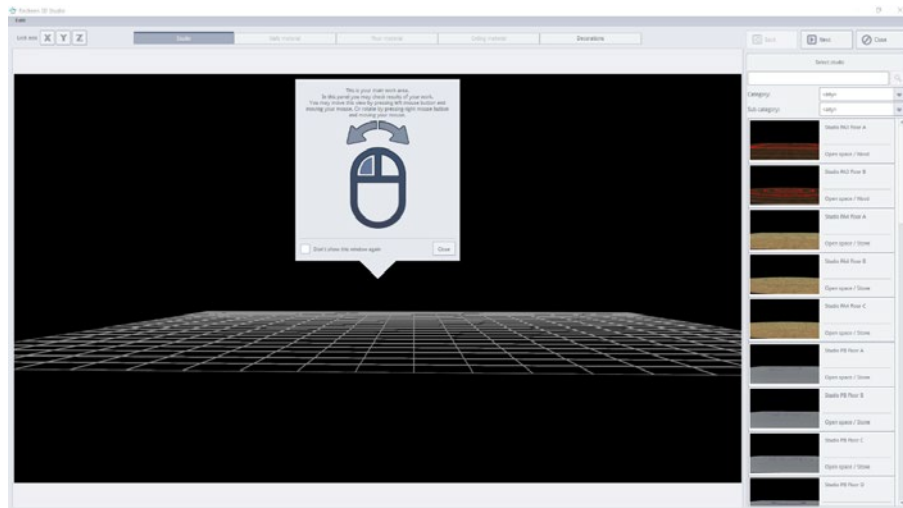


The button with inscription: [Reset pop-up hints visibility to default state](#) will become highlighted and the

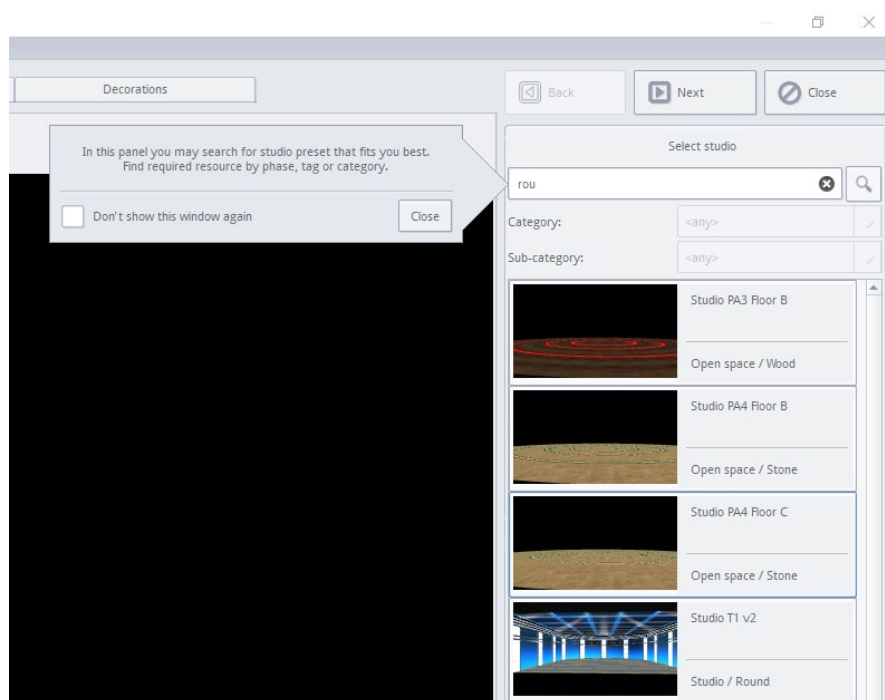
hints start appearing again. The **first step** after opening a Wizard is to **choose a studio**.

You will be guided through the consecutive steps by the appearing pop-ups.

Picture below - a Window with a mouse - workspace.



A pop-up with instructions on how to select a studio by entering **keywords** Picture below.



A window with **search results** Picture below.

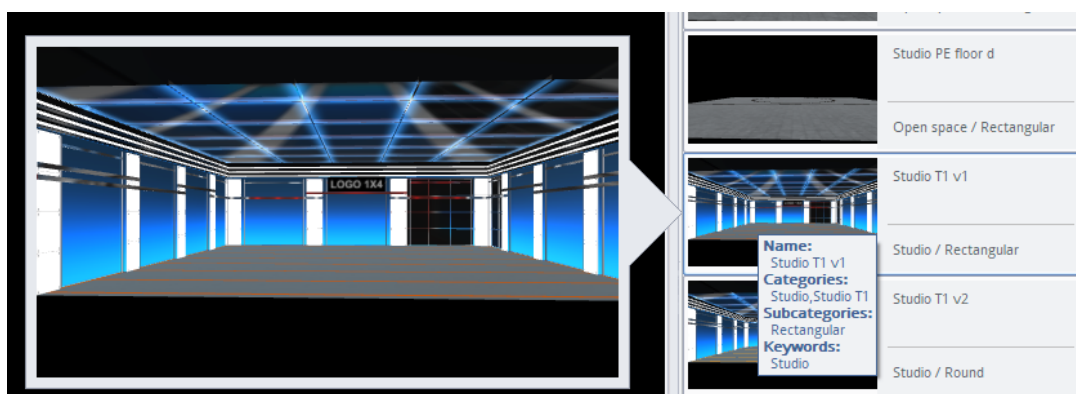


You search the studios by typing the name in the box, [news](#) for example. Then, all the studios that have [news](#) phrase in their name or in their category, will be listed. You don't have to type the entire word, the search engine will show you suggestions after entering at least 3 letters of the phrase. (See the previous Picture.

The first step is to choose a studio. The [Wizard](#) launches with the [Studio](#) tab already open. Other tabs are as follows: [Walls material](#), [Floor material](#), [Ceiling material](#) and [Decorations](#). Some of them may be disabled (inactive) by the studio designer's intent.

First, choose a studio template. When you move the cursor over the template, it becomes highlighted and an additional enlarged window appears.

Move the cursor over the window and right-click it to display the [template's name](#), [category](#), [sub-category](#) and [keywords](#). Picture below.

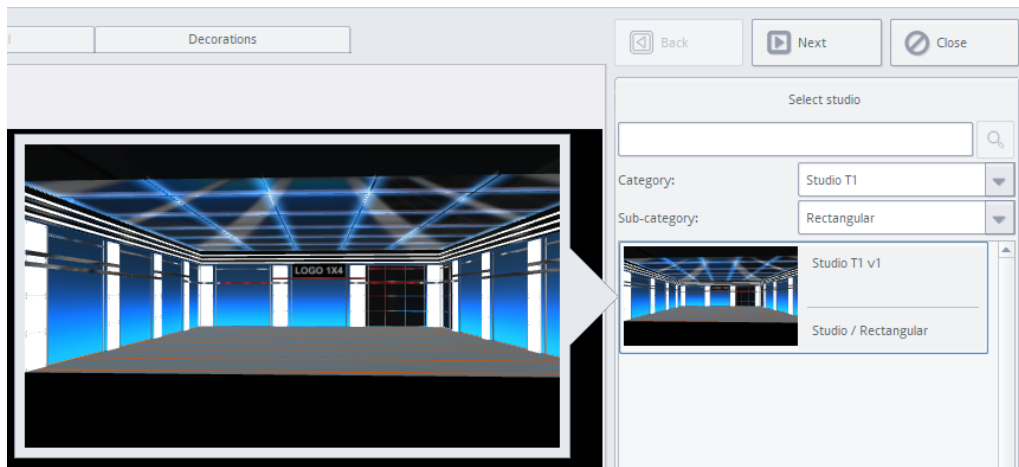


If you have a lot of items to search for, just enter the [keyword](#), or its first three letters, for example, search for the studios that have "[news](#)" in their name. After entering "[new](#)", the studios that have this phrase in their description will appear. It may be any part of the name or the word in the studio's description.

For the word "transparency", you can enter either the [first three](#) letters of the word ("tra") or any string of letters in the middle of the word (like "spa"). Some elements, like "tv", have only two characters, therefore you can type a two letter string, "tv" for example, and press the space-bar to create "tv".

Some of the preview pictures have a small icon in the corner. When you click it, another window appears with the stage design preview, showing how it might look like in the final perspective and what elements it contains. This facilitates selection of appropriate elements.

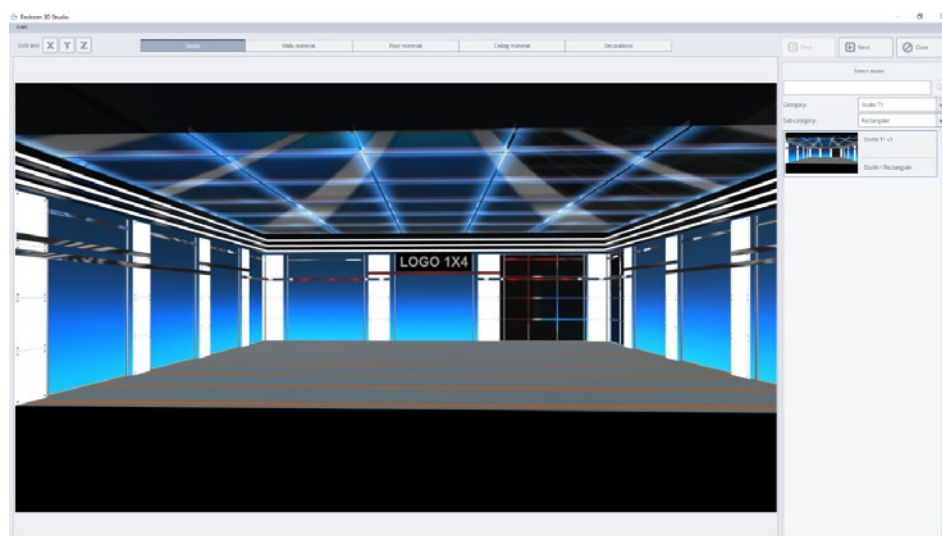
You can narrow down your search by selecting **Category** and **Subcategory** from the drop-down list. Picture below.



A red question mark ("?) appears on some of the STUDIO TEMPLATE thumbnails. With its help, you can open another window in which you will see a view of the set design along with the use of individual objects, as an example, in the same category.

After selecting the studio template, click it to load it.

Depending on the selected template, all or some of the tabs will be available at the top of the screen. If the graphic designer assumed, for example, that the floor material in the studio cannot be changed, this tab will not be active. You can change the tabs by clicking on them or by using the **Back** and **Next** buttons at the top right corner of the screen. Picture below.



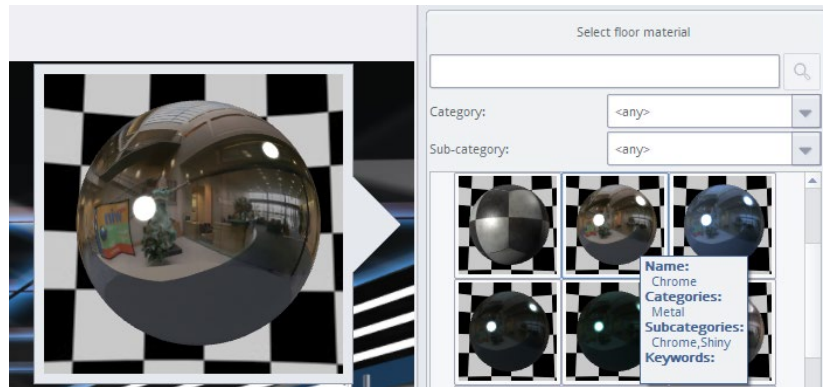
You can navigate through the loaded studio with your mouse. The same rules apply as for the mouse movements in the studio editor. See the chapter: [Virtual 3D studio editor](#), paragraph: [Operating modes: Camera and Object](#).

All the operations available in the studio, such as mouse movements or locking **XYZ axes**, are transferred from the [Virtual 3D studio editor](#). Only the rotation around the selected object is disabled, as it was

deemed useless in the [Wizard](#).

Now, you can go to the next tab: [Walls material](#).

You don't have to mark specific elements of the walls in the [Wizard](#). The material is changed in all the studio areas specified by the designer. All you need is to select the desired wall material from the materials list on the right side of the screen. Just as in the [Studio](#) tab, when you move the mouse over a specific material and right-click it, its properties are shown, namely [Name](#), [Categories](#), [Subcategories](#) and [Keywords](#). Picture below.



Like before, you can use the smart search typing only [3 letters](#) of the name.

You can, of course, choose entire group of interesting materials from the drop-down list by selecting [Category](#) and [Subcategory](#).

For example: Choose [Category: Natural](#) and [Subcategory: Shiny](#). A list of materials with these properties will appear. Next, type the word "[red](#)" in the [search-bar](#). Now, only the red ones will be included in the material group.

The process of choosing materials in the [Floor material](#) and [Ceiling material](#) tabs is exactly the same.

Now, let's move on to the [Decorations](#) tab.

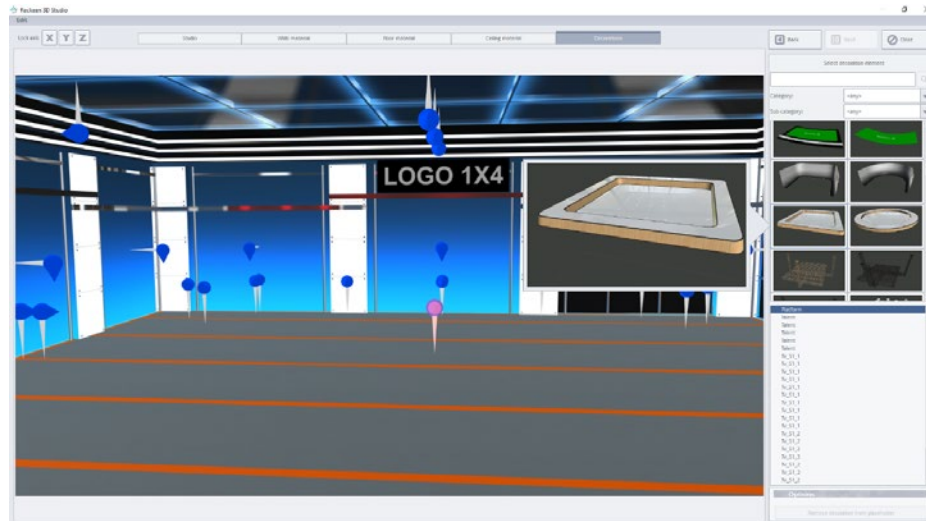
In the [Decorations](#) tab, so called "[placeholders](#)" appear in the view of the studio. Picture below



Placeholder's positions are pre-defined in the studio's design. Select any one of the placeholders in the preview window and click it with the left mouse button. Then, the placeholder lights up red and starts blinking. A placeholder can be selected with a mouse or indicated by selecting it from the list of all placeholders. Picture below



When you click on the placeholder, the “pin” lights up and starts blinking. Then, select from the list of the elements an object to be “affixed” in that place. Let's choose a platform. Picture below.



When you click on the **selected object**, the **placeholder's** pin will disappear replaced by the selected object. The object will be inserted exactly where the **placeholder** has been. The object will be facing direction indicated by the arrow on the placeholder's pin.

A red question mark (?) appears on some of the objects' thumbnails. With it, you can open another window in which you will see an example this object's use in the set design prepared by the graphic designer. Picture below.

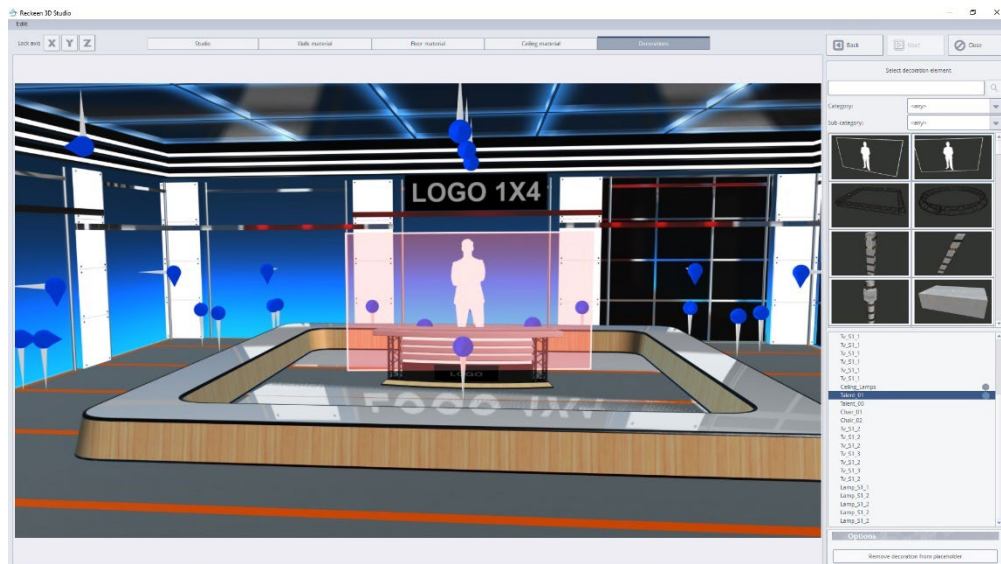


Simultaneously, a new position will appear on the list of placeholders: a **Platform**, along with a drawing of a small cube next to it. It means the placeholder has been replaced with an object.

Note that this object, the **Platform**, also has its own placeholder on its surface. You can now place, for example, a desk on this platform. Click the **placeholder** visible on the platform and then select the object: **Desk**. Picture below



What's more, the desk object has two placeholders. You can place a Talent behind the desk using one of them. Picture below

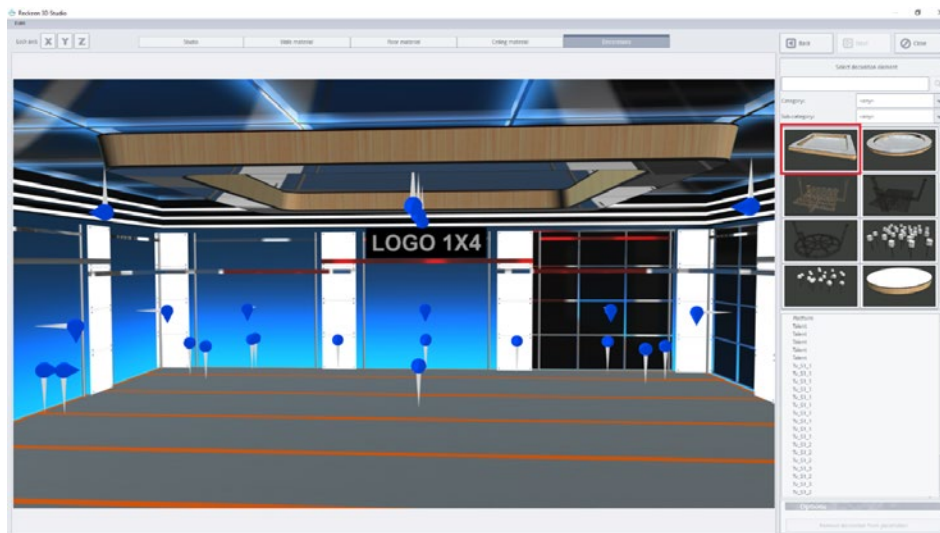


If you want to **remove** the **object** from the placeholder, you have to select it on the screen by clicking the left mouse button on it. The whole object will light up and start blinking. Now, remove the object by pressing the button: **Remove decoration from placeholder**, located at the bottom right corner of the screen.

You have to remember that, if you select the **Platform** object, as in the example above, you it will be removed along with all the objects attached to it.

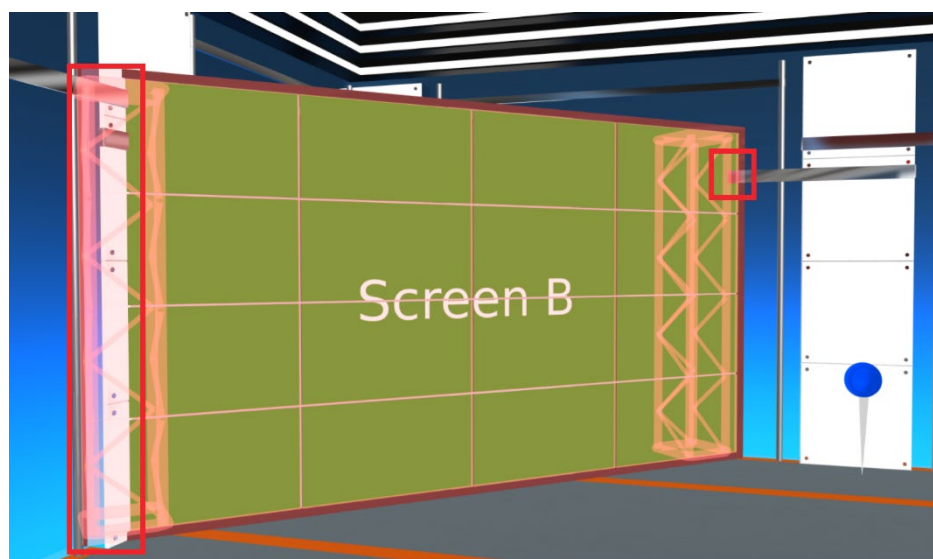
The available objects are listed and displayed in the windows. In the windows, the objects are visible in positions as if they were replacing their placeholders located on the floor, that is the placeholder's pin was pinned to the floor. The arrow on the top of the placeholder determines the direction the object will be facing.

If the placeholder is pinned to the ceiling, and its **pin** is “**upside down**”, then an object loaded to such a placeholder will also be turned “upside down”.

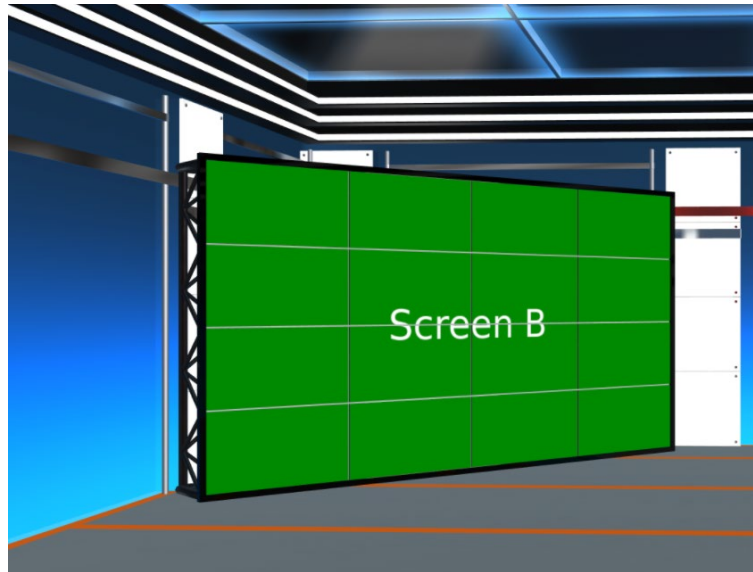


Let's look at the platform placed on the ceiling in our example.

It may happen that, when you want to place an object in your studio on a particular placeholder, it may not be a perfect fit. The object may, for example, “impale” the wall. Picture below



Do not worry about that, let's now leave the object in that place, as accurate corrections and shifts will be done later on in the **Editor**. Picture below.



Edit: Undo and Redo functions

There is an [Edit](#) option available at the top left side of the screen. You can trigger [Undo](#) and [Redo](#) functions from the drop-down menu or through the keyboard shortcuts.

- [Undo](#) function - erases the [last](#) introduced change.
- [Redo](#) function - reverses the [Undo](#) command.

Principles of the functions' operation are the same as previously described in the [Studio 3D Editor](#). The only difference is that, in the [Wizard](#) you cannot undo the camera movements, which was possible in the [Editor](#). There is no [Camera](#) tab in the [Wizard](#), therefore these movements are not recorded when designing the studio.

After adding all the objects, you can go back to the [Ceiling](#) tab to see the studio without placeholders. You can neither select, add nor remove the objects in the [Ceiling](#) tab and in the [Walls](#) tab. Instead, you can once again change the materials covering the ceiling, the walls or the floor if they don't match the added objects.

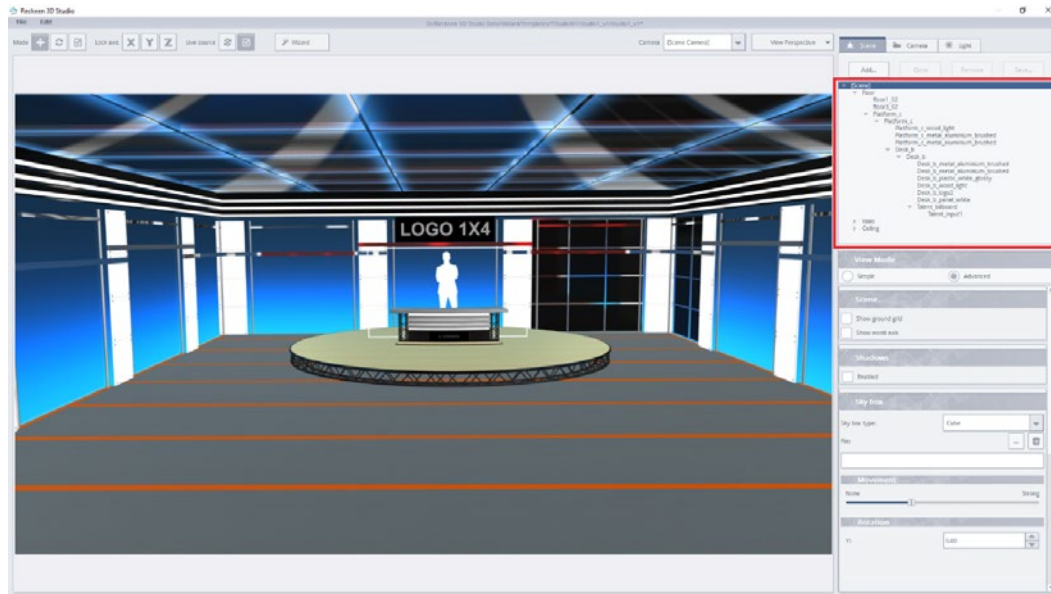
You can press the [Close](#) button if there are no more changes for you to make. The [Wizard](#) will be closed and you will be automatically redirected to the [Editor](#).

Now, you can continue with the editing.

The [Wizard](#) allows you to design a studio quickly and easily. But let's remember that you go through the [Wizard](#) only once, putting all the necessary elements in the studio. The studio once created in the [Wizard](#) cannot be loaded to the [Wizard](#) again. If you have forgotten about some object and you want to [add](#) it, you can do it in the [Editor](#).

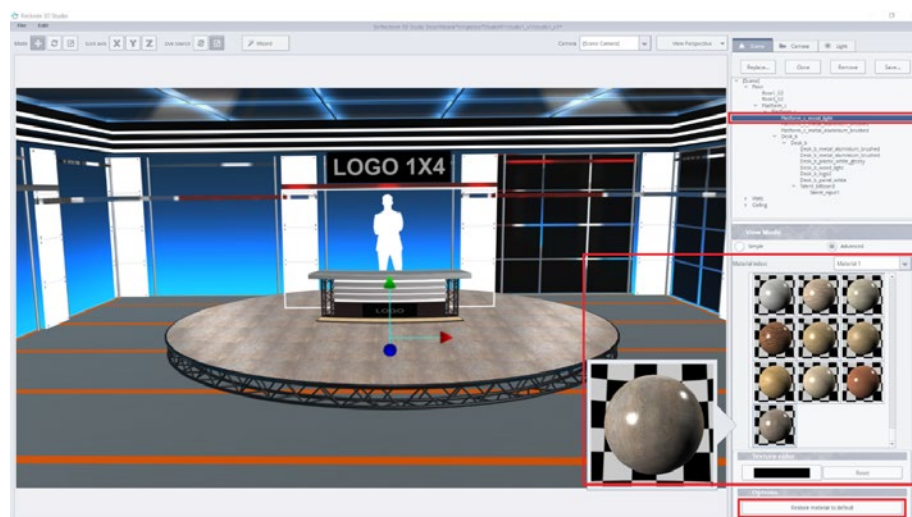
In order to be able to design each of the elements in the [Editor](#), you have to change the mode from [Simple](#) to [Advanced](#).

In the [Advanced](#) mode, you can display an entire tree structure of all the elements by clicking on the triangular markers that appear in front of the names of the objects and their elements. The whole process of building the studio, that is placing a [platform](#), a [desk](#), or a [chair](#) on the [floor](#) and so on, will be reflected in this structure. You will only see one element in the [Simple](#) mode - the [Floor](#). In the [Advanced](#) mode, you will be able to display all the items placed on the consecutive placeholders. Picture below.



When you [click](#) on the [name](#) of the [primary element](#) in the tree, a window will appear below the tree, containing materials that can be used.

You can change the item's material by clicking on the selected material's thumbnail.



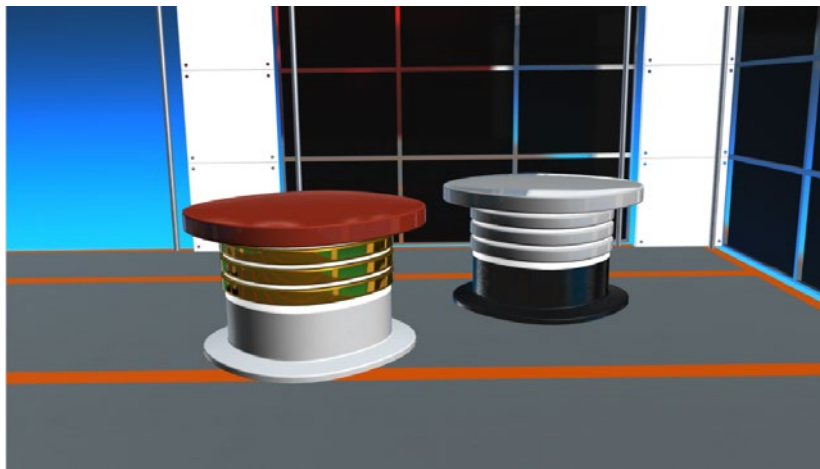
In the case of such objects as talent or screen, a tab with materials database will not be visible. There is no possibility to change their material, even when you switch the Live option to Bitmap and use graphic images. Some Logo type objects (that could be found in the database) also don't have an option to change their material. In some set designs, you can find certain logo type objects, under which you can both change a material and apply an appropriate graphics with transparency. In the case of an object's Clone, both the material and its color are transferred.

If you are not satisfied with the change, you can restore the item's basic material by pressing the [Restore material to default](#) button located at the bottom right of the screen.

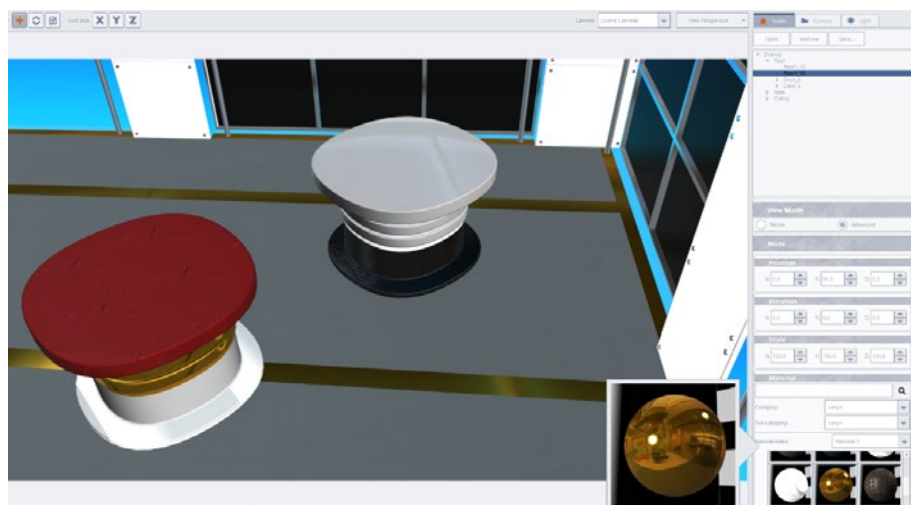
It is possible to change the color of some of the materials. It is done with the color wheel.

You should bear in mind that you change a color of a specific material, so if the same material has been used in any other object, that object will also be subjected to a color change. You cannot change the color of some of the objects. In the case of objects loaded with Microsoft Paint 3D such option may be locked and you will be informed about it with a message. If you want to restore a default color, you have to use the Reset function. In the case of an object's Clone, both the material and its color are transferred.

In the [Editor](#), all the objects added in the [Wizard](#) can be moved, cloned, their color changed, their elements removed etc. In the picture below, you can see two desks, original one on the right, and the cloned one with the materials changed on the left.



In the [Wizard's Ceiling](#) and [Walls](#) tabs you could only change the materials to the extent determined in the project. If you wanted to change the color of the floor stripes (as in the picture above), it would not be possible in the Wizard. You can do it in the [Editor](#). All you have to do is to find the floor stripes element on the tree in the [Advanced](#) mode and change the material. Picture below



11



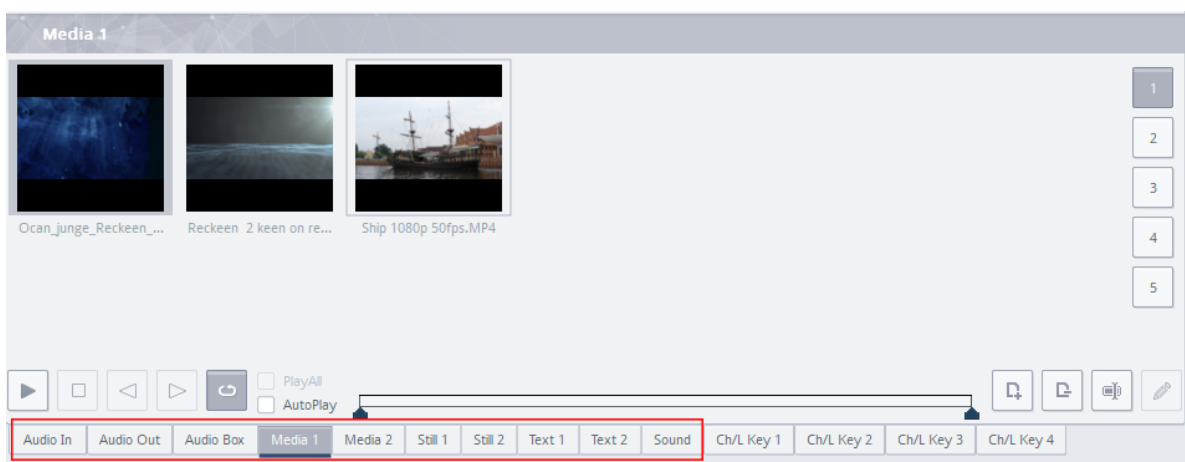
Media tray

The Reckeen 3D Studio system allows you to use [video files](#), [image files](#) or [texts](#) during the broadcast of your program.

It is worth to prepare all the necessary media before the broadcast.

WARNING! If you have media files (videos, images, sounds) stored on external sources, such as a memory stick or an external hard drive - you should copy them to the Reckeen 3D Studio system hard drive. External storage may not have an adequate file transfer parameters during the production, which may result in improper recording of your work or unstable operation of the whole system!

Shortcuts to the media files should be located in the appropriate tabs of the [media tray](#). This will facilitate usage of the media during the program production, as opening files on a regular basis requires multiple clicks and there may not be enough time for that while operating on the air. [Media tray](#) is used for adding the media and managing the shortcuts, as illustrated in the picture below. Tabs with media files are marked in red.



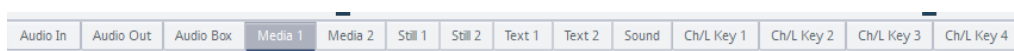
Please note that no operation on the media files in the tray changes them on your hard drive. [Removing](#) or renaming a file in the [media tray](#) only affects the files' [shortcuts](#) in the tabs. It is also possible to add the same file multiple times on the same or on the different tab in the tray. You can also [change file names](#) (shortcuts) and [use the same file under different names](#).



There is a possibility to [group the files](#) within the tabs, thereby creating categories of your interest. It is made possible thanks to [sections](#) (labeled from 1 to 5) located in the [trays](#). With the sections you can organize files for specific tasks.

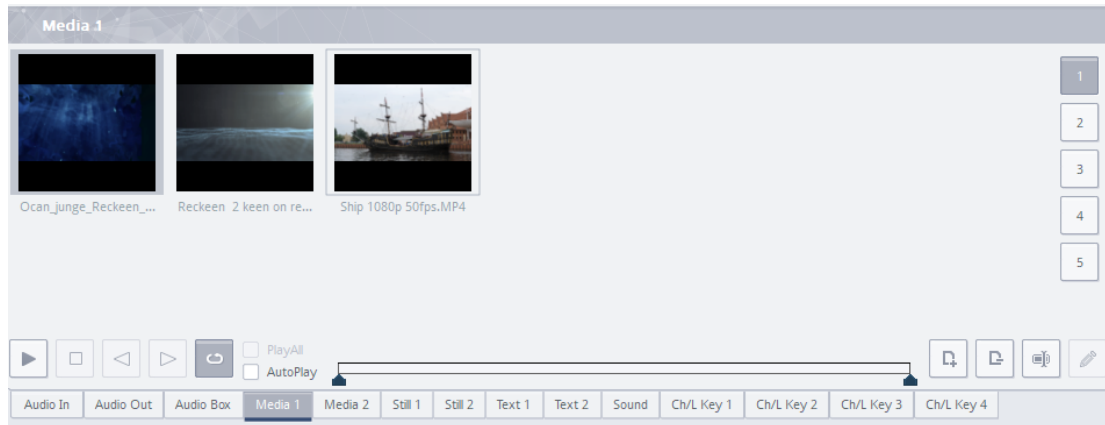
Note! When you replay a file from [any of the sections \(1 to 5\)](#) within the PGM source, that is [live](#), then switching the section to a different one will trigger the file's from the [new section autoplay](#) and going on the air. It is suggested, therefore, to prepare necessary videos and images in advance.

A tray holds [7 tabs](#) assigned to specific players. There are two tabs for video files ([Media 1](#), [Media 2](#)), for image files ([Still 1](#) and [Still 2](#)), for text or image boards ([Text 1](#), [Text 2](#)) and audio files ([Sound](#)). The Reckeen 3D Studio system supports multiple media formats. It also has an integrated support for multiple codecs for playing video files.



Media 1 and Media 2 - as shown in the picture below, this is where you can view video clips.

Click on the **Add** icon (in the lower right corner of the screen, with a small plus sign) to browse your local hard drive and add video files. You can put video files in five sections. You change the section by clicking on the buttons marked with numbers from **1** to **5** located on the right side of the screen.



Supported video files formats and codecs (concerning media added to Media 1 and Media 2 tabs):

MPEG2, MPEG4 and H.264 containers: *.mpg, *.mpeg, *.mp4, *.avi, *.mxf, *.mov

Still 1 and Still 2 - as shown in the picture below, this is where you can view image files.



Click on the **Add** icon (in the lower right corner of the screen, with a small plus sign) to browse your local hard drive and add image files. You can put image files in five sections. You change the section by clicking on the buttons marked with numbers from **1** to **5** located on the right side of the screen.

Supported file formats of a bitmap type (concerning media added to **Still 1** and **Still 2** tabs): *.jpeg, *.jpg, *.bmp, *.png (with transparency)

Text 1 and Text 2 - as shown in the picture below, this is where you can view files with text boards or images, most often used in the **DSK** module.



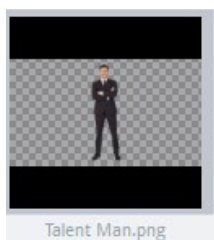
Click on the Add icon to browse your local hard drive and add text board files. Just as before, you can put text board files in five sections. You change the section by clicking on the buttons marked with numbers from 1 to 5 located on the right side of the screen. Supported file formats of a text board and image type (concerning media added to [Text 1](#) and [Text 2](#) tabs)

[*.jpeg](#), [*.jpg](#), [*.bmp](#), [*.png](#) (with transparency) , [*.recstill](#), (STILL editor module format)

Reckeen 3D Studio allows you to use videos and still images in the broadcasted program. The use of media requires two steps: adding a file to the tray, loading the medium into a virtual player.

For each file added to the media tray, an icon is automatically generated. It shows you a preview of its content. At the same time it is a shortcut allowing you to access the file.

You can [sort the icons](#) within the tab with drag and drop. Files with the [alpha channel](#) (transparency) have a preview showing on object on a background of a gray white grid.



In order to add a file to a tray, select the appropriate tab (optionally its sub-tab). Then press the [Add File](#) button or [double-click](#) on an empty area in the selected tray. Then select a file on your hard drive with a typical file selection window.

[Delete file](#) (with small minus sign) button is located next to the [Add file](#) one. It allows you to remove the currently selected file from the tray. If the file being deleted has already been loaded into the player, you will be asked to confirm the action. After removing the file (media), the preview of the given player will display a blue background.

Another operation on a file in the media tray allows you to change the file name. In order to rename a file, select the file's icon and press the [Rename](#) button (on the right side of [Delete](#) file button). Then enter the new file name.

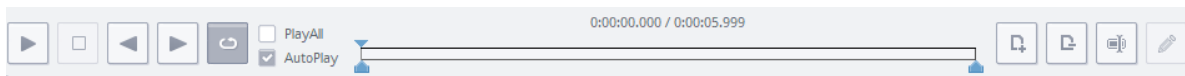
PREPARING MEDIA FOR BROADCAST

Using the medium added to the media tray is very simple, it requires only one step. You just have to find the file in an appropriate tab of the media tray and double-click it with a mouse. From this moment on, the medium is replayed ([Media 1](#), [Media 2](#), [Still 1](#) or [Still 2](#), [Text 1](#) or [Text 2](#), [Sound](#)) and can be used directly in a live program.

You can select a single file from each of the tray media tabs and load it into a player. In the case of video

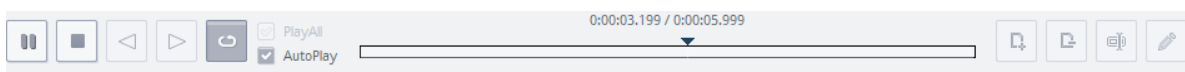
files ([Media 1](#), [Media 2](#)), you can play up to two video files at the same time

- one from each of the tabs, that is one file in the [Media 1](#) tab, and the second one in the [Media 2](#) tab. The keys used to control the playback of a file loaded into a player are located at the bottom of the media tray.

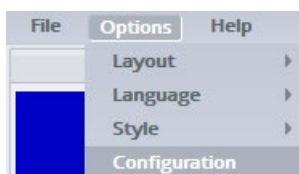


There are the following functions available:

[Play](#), [Pause](#) (on the same button as [Play](#)), [Stop](#), [previous Frame](#), [Next Frame](#), [Loop](#) (switch the playback loop) Additionally, a playback progress bar is displayed along with information about the length of the movie, the current playback position (picture below), [Mark In](#) and [Mark Out](#) markers (picture above) and [PLAY ALL](#) and [AUTOPLAY](#) functions.

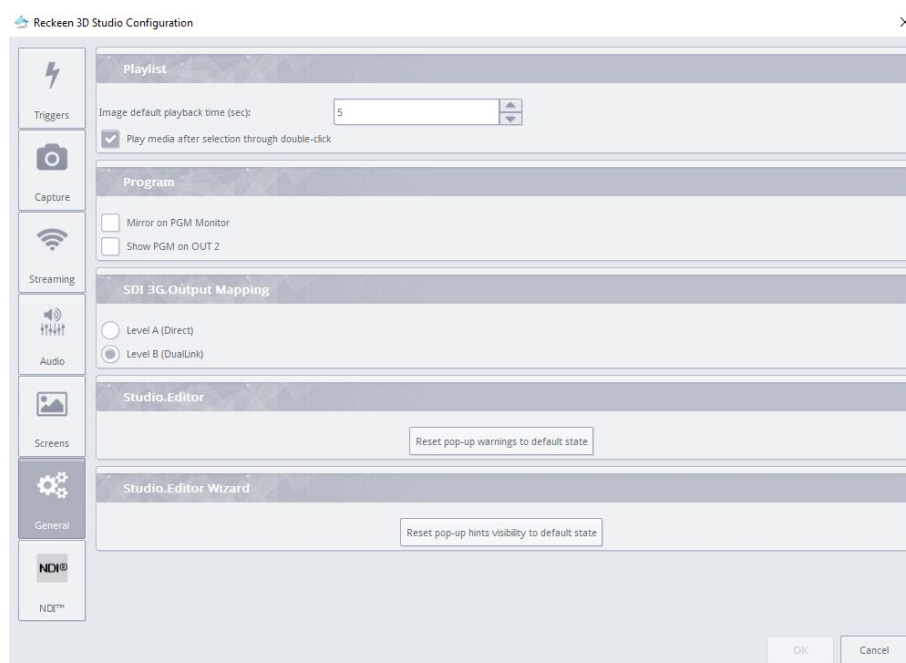


When you double click on a video file's icon in the tray, this video file is directly loaded into the virtual player and starts to play in a loop. [Play media after selection through double-clicking function](#) and the [loop function](#) are enabled by default.



In order to turn the [Play media after selection through double-clicking function](#) off or on, you have to click on the [Configuration](#) icon at the top left of the [production screen](#), and then select [Configuration](#) from the drop-down menu.

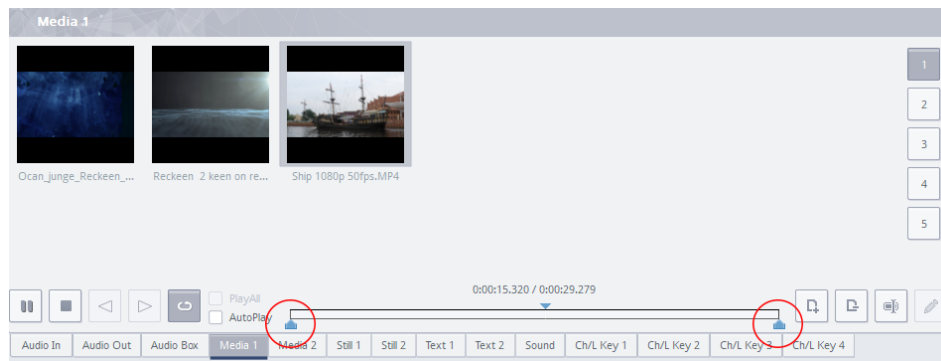
This opens a window, where you have to click on the [General](#) icon on the left.



When the **loop** is off, the video stops at its last frame. Pressing the **stop** button sets the playback to the first frame.

SETTING VIDEO PLAYBACK TIME. MARK IN AND MARK OUT TAGS

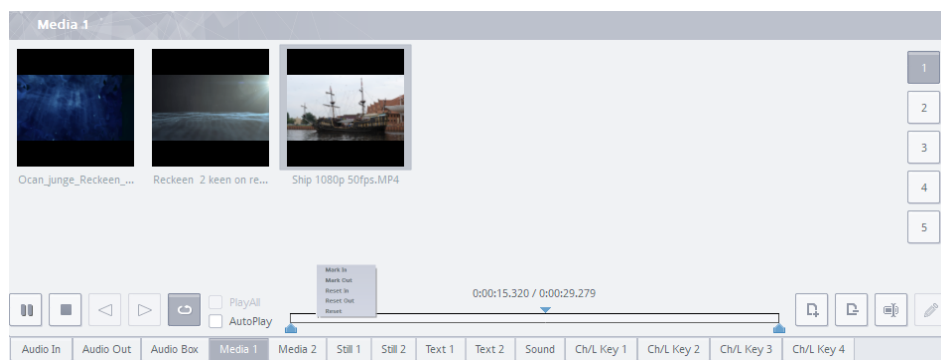
If you want to show on the air only a part of the video that interests you, you have to use the markers of a beginning and of an end - **Mark In** and **Mark Out**. You can set them to replay any selected portion of the video. The first marker - **Mark In** marks the beginning of the video file fragment, while the other one - **Mark Out**, its end. You can move the markers with your cursor on the playback progress bar.



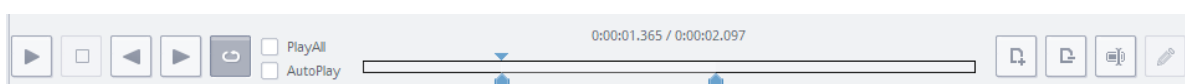
If you want to set a **Mark In** marker precisely on a chosen video frame, use the buttons that allow you to move the **playback position marker** (blue triangle) by one frame forwards or backwards.



When you set the **playback position marker** exactly on the selected frame, place a cursor on the **progress bar area**, and click the **left** mouse button. Select **Mark In** from the drop-down list. The picture below.



Then, the **Mark In** marker will be set in the exact same position as the **playback position marker** is located.

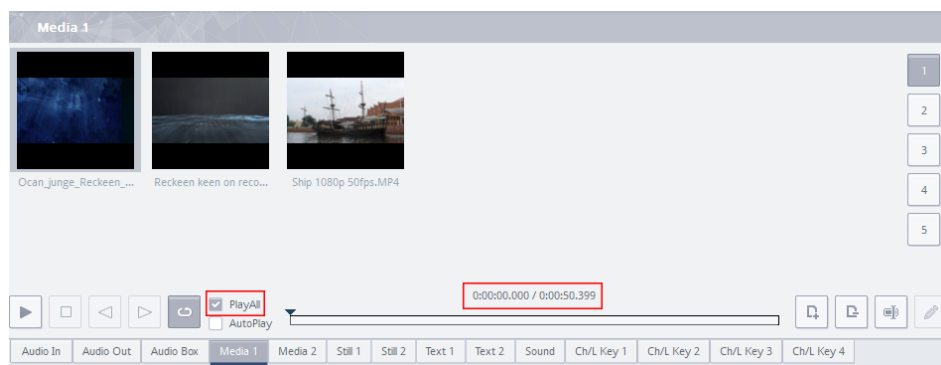


If you want to use **several fragments** of a given video, you have to load the video file several times into

the tray and mark the respective fragments in each file separately. In order to make them into a single continuous video, a [Play All \(playlist\)](#) function, described further in this manual, should be used.

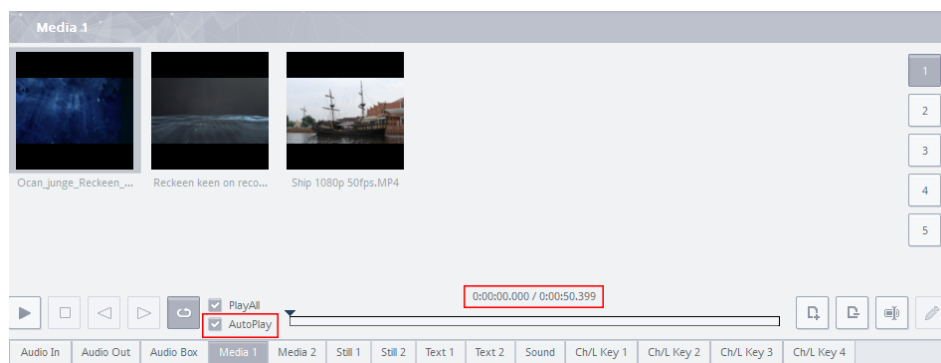
CREATING A VIDEO FILES PLAYLIST

If you have already prepared a couple of files, you can replay them in a given order. A [Play All](#) function is used for that purpose. This way you will create an aggregate video, the length of which will be the sum of the lengths of all the files. Note that, before you will be able to turn this function on in the tray, replaying all the files has to be stopped. It is therefore necessary to press the [Stop button](#) before enabling this function.



VIDEO FILE AUTO PLAY FUNCTION

When you enable the [AUTO PLAY](#) function, in the moment of entering the vision (or the [PGM screen](#)), a video file will start playing from the beginning, regardless of whether it is an only source on the vision or it is a source displayed on a virtual scenography screen. If the [Mark In](#) marker has been set in the file, the playback will start from that selection. In the case of a [playlist](#) - it will start from the beginning of the first file or from the location of the [Mark In](#) marker in the first file.



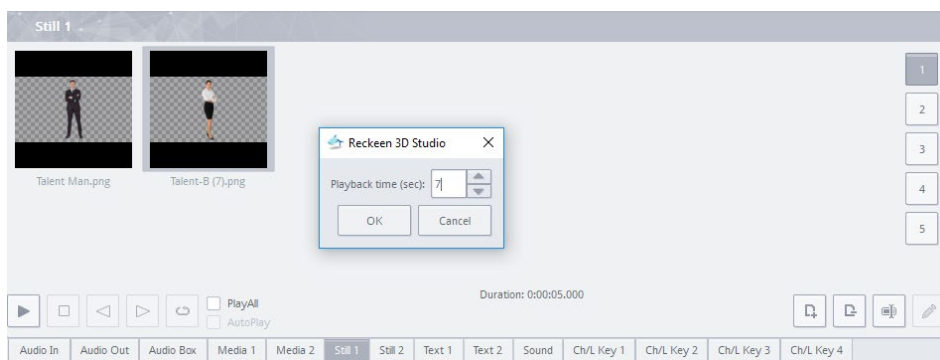
Files from the other tabs ([Still 1](#) or [Still 2](#), [Text 1](#) or [Text 2](#)) will be displayed continuously after loading to the player. Their playback time is not specified. It lasts as long as the file is not replaced by another file loaded into the player. If you delete a currently playing file from the media tray, its content will be replaced by a blue background.

DISPLAYING IMAGES IN THE SPECIFIED TIME

Each image file has a default playback time set to 5 seconds. To change this value, click on the file and select **Set playback time** from drop-down menu.

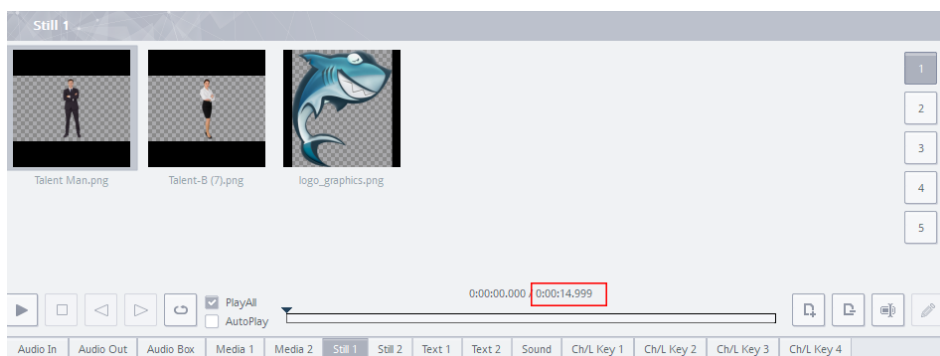


Then, set the desired value in seconds with the white arrow keys, as shown below.



PLAY ALL FUNCTION

You can display a couple of images one after another. If you change the second image's playback length to 25 seconds, you will see the total playback length on the screen - in this case 31 seconds. Note that, in order to be able to turn the **PlayAll** function on, you have to click the **Stop icon** first.



The same principles as to the images ([Still1](#) and [Still2 tab](#)) apply to the texts ([Text1](#) and [Text2 tab](#)). If you want to set a break between the two displayed captions, you have to load an empty file between these files and adjust its playback time (length of the pause).

LIST OF IMAGES OR TEXTS AUTOPLAY

Enabling the [AutoPlay](#) function means that the image list will start playing from the first one in the moment of medium's, that is the tray image's, introduction on the air - the [PGM screen](#). Similarly, if you want to get subtitles with important news that will be changing automatically during the program, you can create a list of such subtitles directly on the ready-made boards in [*.recstill](#) files, set the display time for each text and then enable the [AutoPlay](#). Use the [Loop](#) function if you want the list to be played again in a continuous manner after it comes to its end. If you want to change the text already on the air please see chapter : [DSK function](#): Swapping the text content already on the air.

ADDITIONAL MONITORS SUPPORT

The Reckeen 3D Studio system operates on multiple input and output signals. To ensure even better preview of these signals, you can use additional monitors connected to your workstation. By using a separate monitor, you are able to obtain a preview larger than the one on the screen in the [3D Production](#) application.

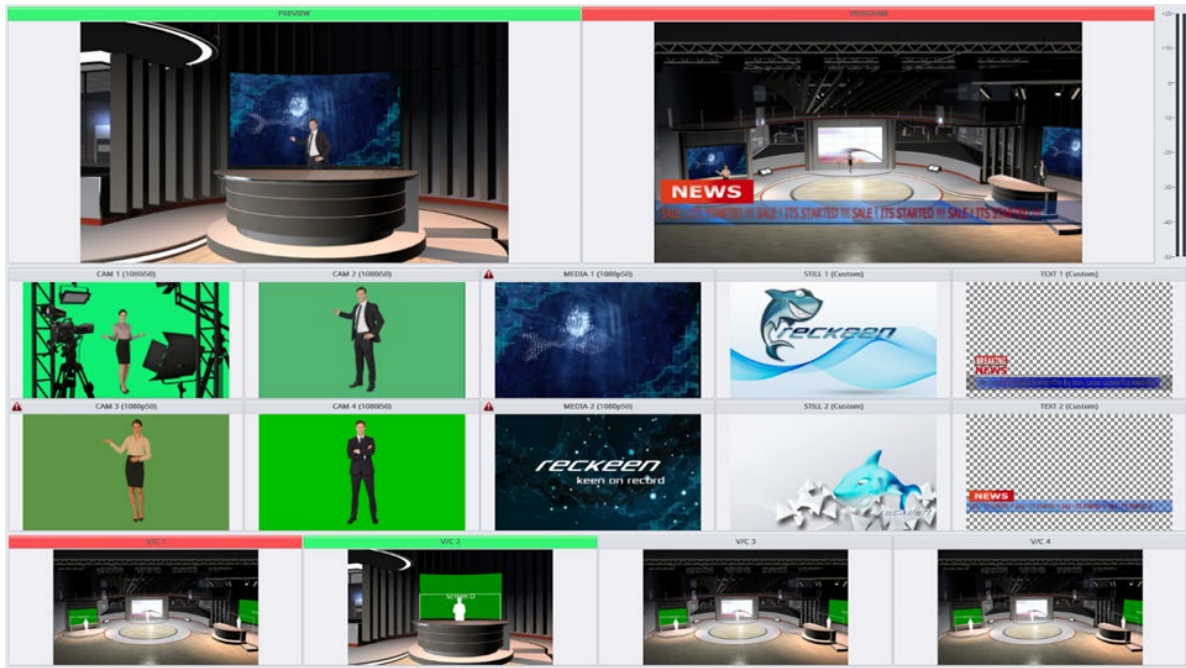
A second monitor can be used to display the [Multiview](#) view. Clear interface shows the previews available in the [3D Production](#) module.

There are the following previews in the [Multiview](#) view:

- [PREVIEW](#) - presentation of the item selected to be broadcasted next,
- [PROGRAM](#) - presentation of the currently broadcasting signal (system output),
- previews of the virtual cameras [V/C 1](#), [V/C 2](#), [V/C 3](#), [V/C 4](#),
- a preview of all the media loaded into the virtual players,
- a preview of the cameras [CAM1](#), [CAM2](#), [CAM3](#), [CAM4](#).

The third monitor, after the appropriate configuration, may display a full screen image from [PREVIEW](#) or [PROGRAM](#) output. Previews on the extra monitors retain their proper aspect ratio. Aspect ratio is consistent with the chosen format, in which the system's broadcasting output operates.

In the picture - a [Multiview](#) view on a separate monitor for the Reckeen 3D Studio system.



SETTING THE DISPLAYED CONTENT ON THE MONITORS

After connecting the monitors to the Reckeen 3D Studio system, the displayed content can be set on the screens.

For this purpose, after opening the [3D Production](#) module, click [Options](#) on the top [Menu bar](#), then click on the [Layout](#) and select the previews' layout that suits your needs from the dropdown menu.

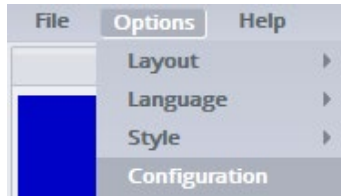
There are the following options depending on the number of the monitors connected:



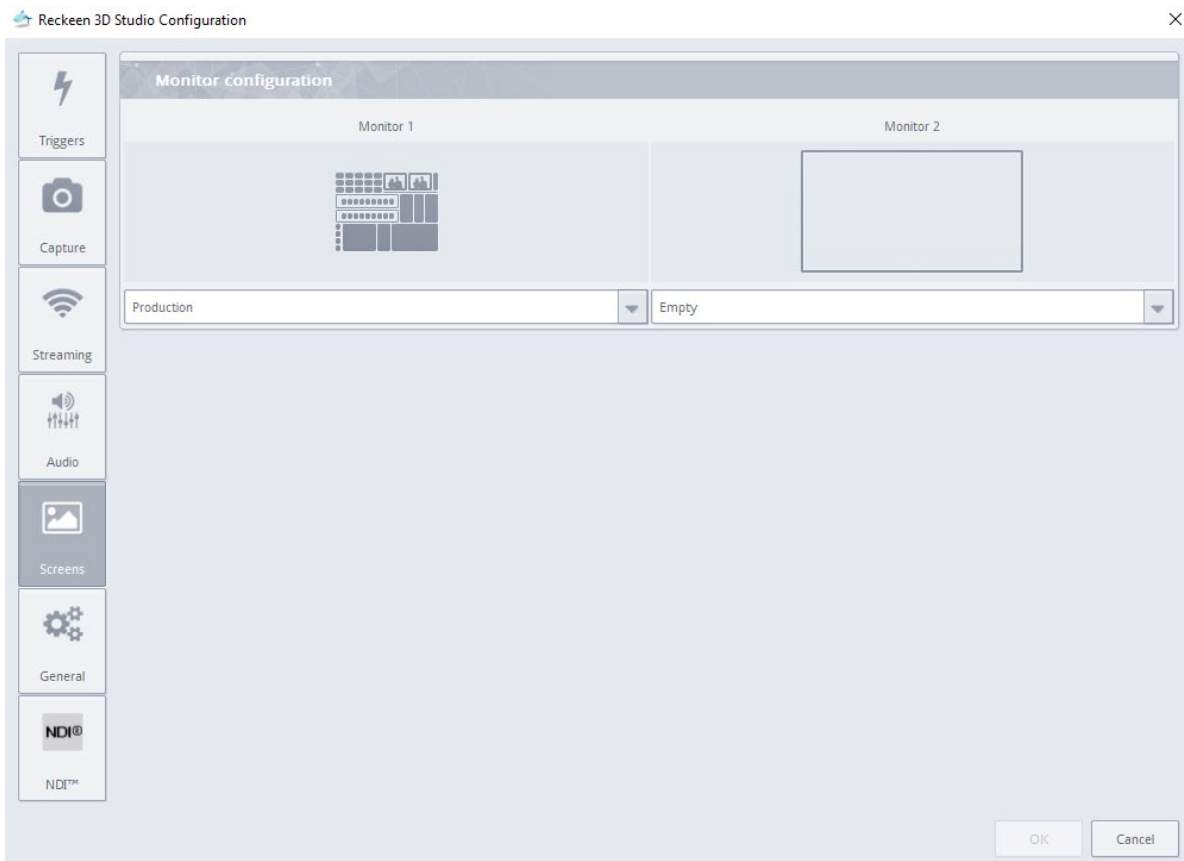
- One Screen,
- Two Screens (Production + Multiviewer),
- Two Screens (Production + Program),
- Two Screens (Production + Preview),
- Three Screens (Production + Multiviewer + Program),
- Three Screens (Production + Multiviewer + Preview) .

After setting the previews' content on the screens, you can also specify which preview from the already selected will appear on which specific monitor. For example, if you have two monitors and the screens already selected ([Production + MultiViewer](#)), you can set, which exact monitor will show the specific

content. To do this, click again on the Options icon at the top left of the production screen and select [Configuration](#) from the drop-down menu.



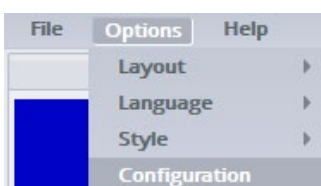
Click on the [Screens](#) icon in the window that opens.



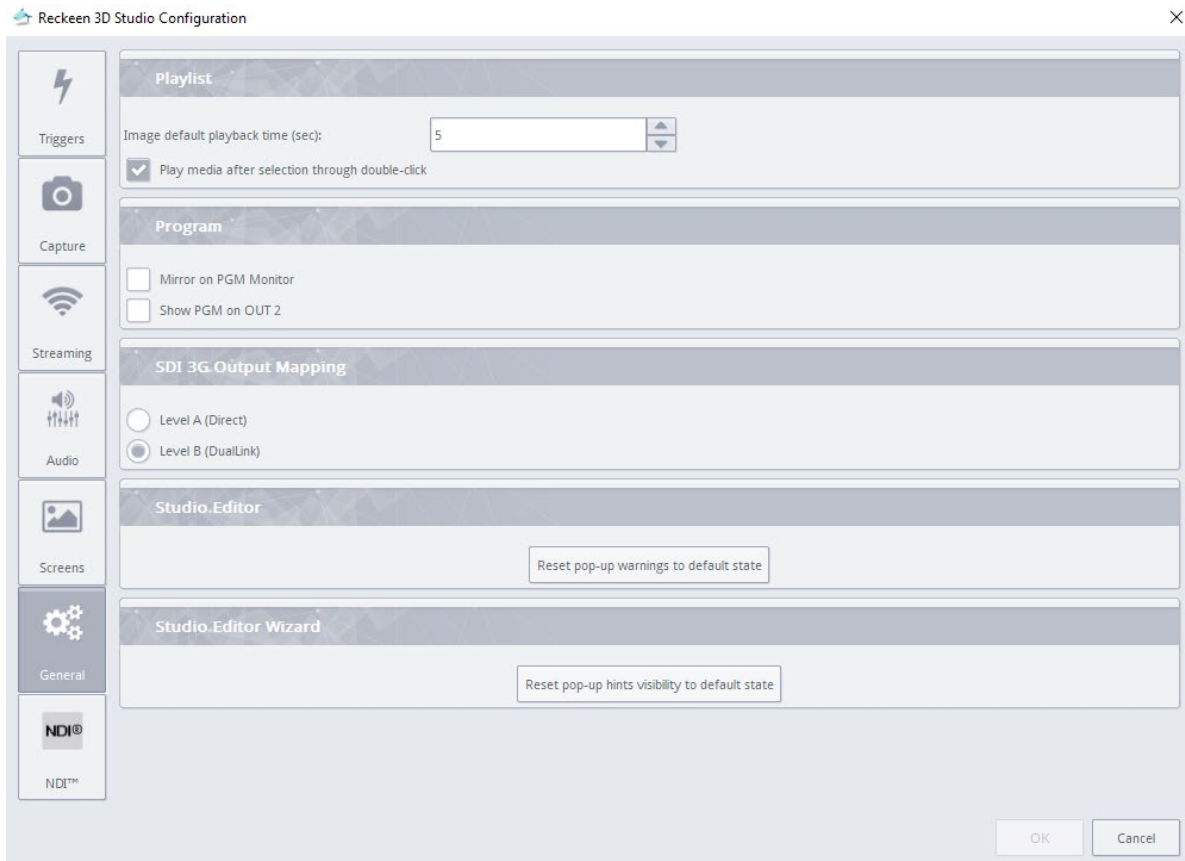
In the opened Monitor configuration window, you can set what [Monitor1](#) and [Monitor2](#) will show ([Production + MultiViewer](#) or [MultiViewer + Production](#)).

MIRROR IMAGE ON THE PGM MONITOR

In the course of making the program, an inverted view from the monitor displaying the [Program](#) (PGM screen) is often needed. This facilitates the work of people facing the camera (their view is a mirror image on the [PGM screen](#)). To set such a [PGM](#) monitor preview, click on the [Options](#) icon at the top left of the production screen and select [Configuration](#) from the drop-down menu.



Click on the [General](#) in the window that opens. Then, check the [Mirror on PGM Monitor](#) option under the [Program](#) caption. The image on the monitor will change after pressing the [OK](#) icon in the lower right corner of the window.



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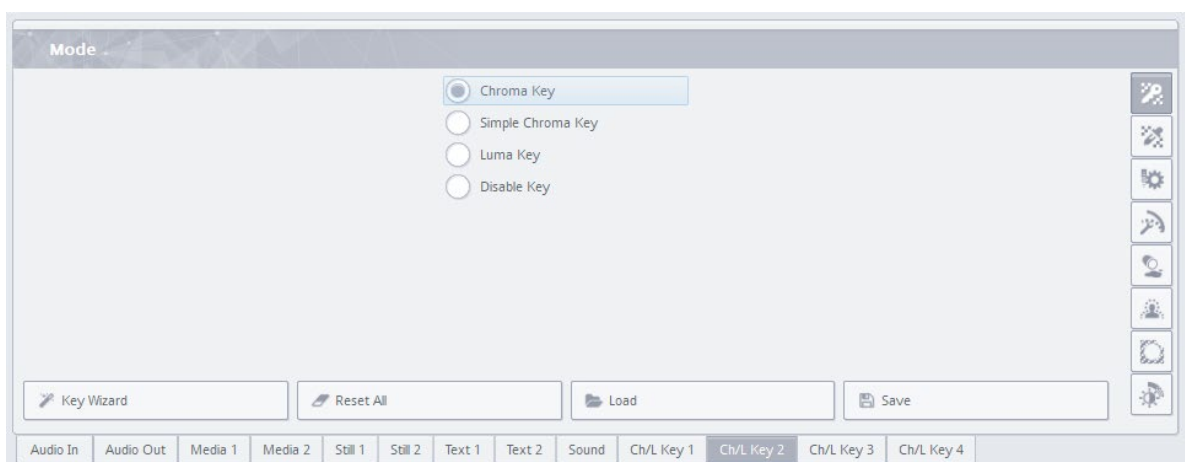
Chroma and luma keying

Keying is a special filter that in the Reckeen 3D Studio system can be used for camera inputs. The principal of its operation is to remove the areas of a specific color (e.g. green) from the image. The green color is removed after you turn the keying on and set its parameters. This way a figure of a presenter filmed on a green background can be placed against any virtual decoration.

The key can operate in either **luminance (luma-keying)** or **chrominance (chroma-keying)** mode. Setting the parameters of the key is done in a few simple steps, through which a special **wizard** can lead you. Thanks to this solution, selection of optimal key parameters is achievable even for the inexperienced users. And the results are impressive.

SELECTING THE KEYING MODE

Click on the highlighted square button **Mode** to choose the keying mode (as shown in the picture below).



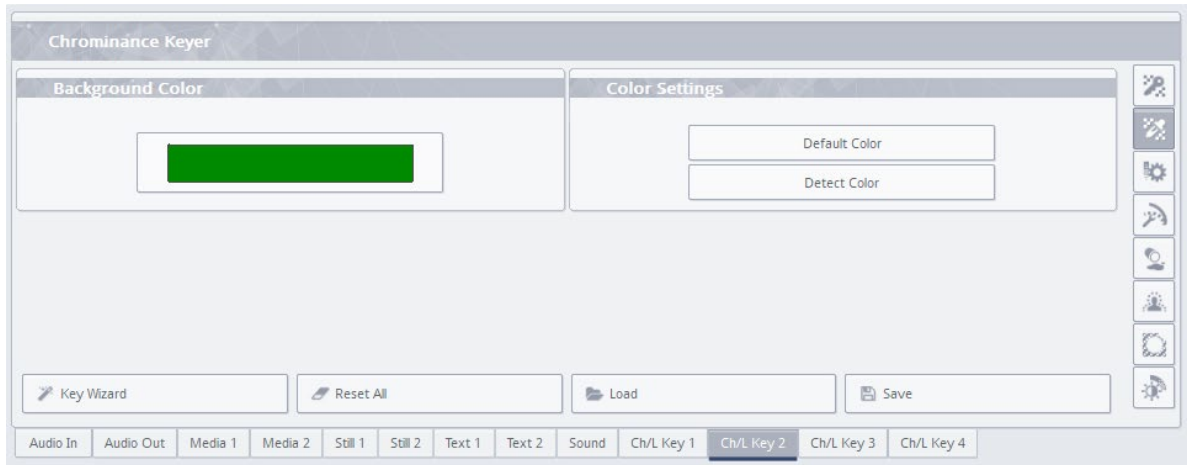
There is a choice between four options:

- **Chroma Key** - precise setting of the key,
- **Simple Chroma Key** - quick setting of the key,
- **Luma Key** - setting of the key on the basis of luminance,
- **Disable Key** - working with the key off.

CHROMA KEY MODE

After selecting the operating mode of the key, the next step is to choose a background color. Click on the button **Chrominance Keyer** below the Mode button.

A window will appear, as shown below. Now you should choose a background color. There are two options: **blue** and **green**. You can change the **background color** by clicking on a **rectangle** with a **green color**. The color of the rectangle also changes then.



In the case of uneven color of the [keyed background](#), you have a button: [Detect Color](#) at your disposal. It calculates [LRGB](#) parameters of the background on the basis of automated averaging. If reception of these parameters is not successful, the user is notified via a message window and then the default color is set. The [Default Color](#) button is used to select the default color.

MATTE CONTROL

Click on the button [Matte Control](#) to set the initial keying parameters. It is done with the [Show Alpha Matte function](#) which, when enabled, shows a mask's window in black and white. Parts of the mask's image for which the colors are closer to white will be opaque, and those closer to the dark - [transparent](#).



A view after clicking on the [Show Alpha Matte](#) icon.



The expected result is getting a black color of the mask's background as perfect as possible. In order to achieve it, you have to move the markers on the [Black/White](#) slider up until you get as uniform distribution of the black color on the mask's background as you can.

A view after the [Black level](#) correction



Moving the slider to the extreme positions will make the remaining objects lose their properties becoming opaque. Therefore, you have to carefully balance the extent to which you use this function, in order to reach a point where there are still some slight but noticeable differences in the distribution of the black background. The next step is to obtain a uniform distribution of white color on the objects that are to remain completely opaque. This non-uniformity may result from the fact that some of the object's colors may have color components close to the keyed color. In this case, you can make adjustments using the [White](#) slider's marker.

You can obtain a perfect distribution of a white color on the object by moving the slider towards the maximum value on the left.

A view after the [White level](#) correction



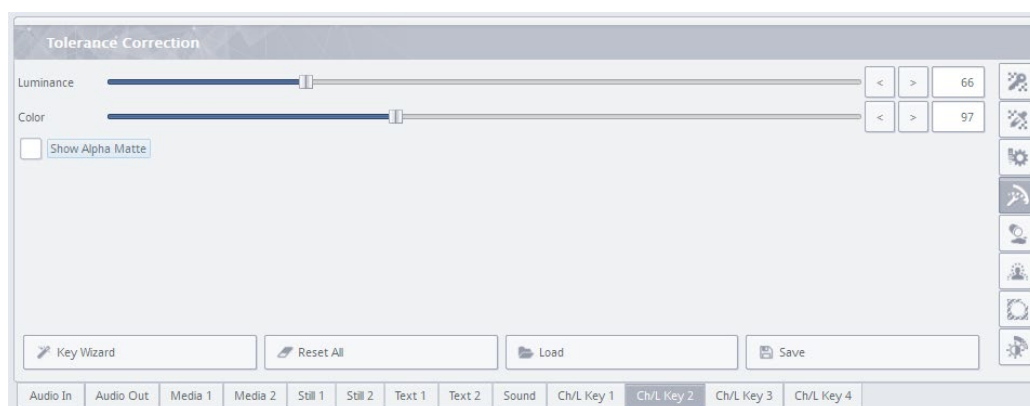
In many cases, the option of [White level](#) setting is used together with the [Black](#) option, in order to obtain the most efficient settings possible of the black background - without losses in white objects and vice versa.

TOLERANCE CORRECTION

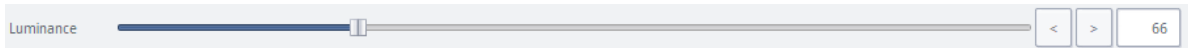
As was shown in the previous picture, widening the scope with the [White level](#) function usually makes the plane, that formerly had a uniform black color, return to the light gray color scale.

In this case, to correct this gray, the two following functions from [Tolerance Correction](#) section are necessary.

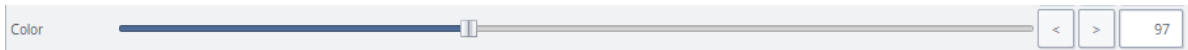
Click on the button [Tolerance Correction](#) to open the tolerance settings window, as below:



The first function - [Luminance](#) - improves the structure of the white mask's [uniform color](#).



The second function - **Color** - means returning to a single structure of the **black background**.



In particular, it improves visibility of an object, when there is a big difference in luminance between the object and the background. In this case, semitransparent objects, like a glass or eyeglasses, become more distinct.

Below you can see a view of an image 'before' correction and 'after' correction.



Color function also fulfills a different task. It allows you to eliminate unnatural contours when you disable **Show Alpha Matte** and return to the actual image. You can remove these contours by improving the limit value between the keyed color and the object.

Below you can see a view before and after the correction with **Color** function.



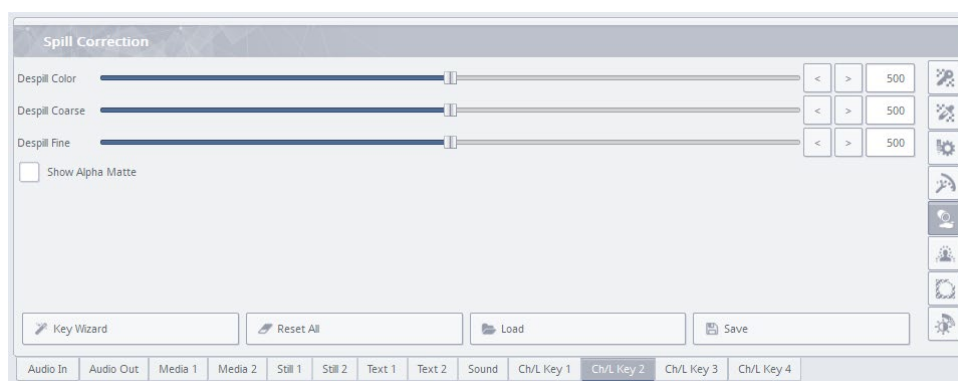
SPILL CORRECTION

Functions in the [Spill Correction](#) section eliminate from the object a reflection effect of the keyed background color. The picture below shows an impact of green color on the object - view before the spill correction.



Click on the icon [Spill Correction](#) to open the spill correction window.

[Despill Color](#) and [Despill Coarse](#) functions are the functions used for preliminary elimination of unwanted color on the basis of [RGB \(red, green, blue\)](#) plane. Below, you can see a section of sliders for spill correction.



When you move the [Despill Color](#) slider to [position 0](#) (to the left), the algorithm will automatically subtract the green color component, in the case when green is a keyed color (similarly blue when a blue background is used). Whereas moving it to a [position 1000](#) (to the right) will cause adding [color red](#) with [blue](#) (when green is a keyed color) or [red](#) with [green](#) (in the case when a [blue background](#) was used) automatically by the algorithm.

You can control the value of the algorithm with [Despill Coarse](#) function. In the case of green background color, the [Despill Coarse](#) function entirely excludes a green component from the object in the [RGB \(red, green, blue\)](#) plane when it goes beyond a certain threshold, resulting in a shift of color to the purple (magenta) area. The picture above shows a view with a green component excluded.



The next function enables more accurate improvement of the correction described above.

When you use the [Despill Fine](#) function, the color of the keyed background is excluded, but this time on the basis of chrominance components. Below you can see the [Despill Fine](#) slider.



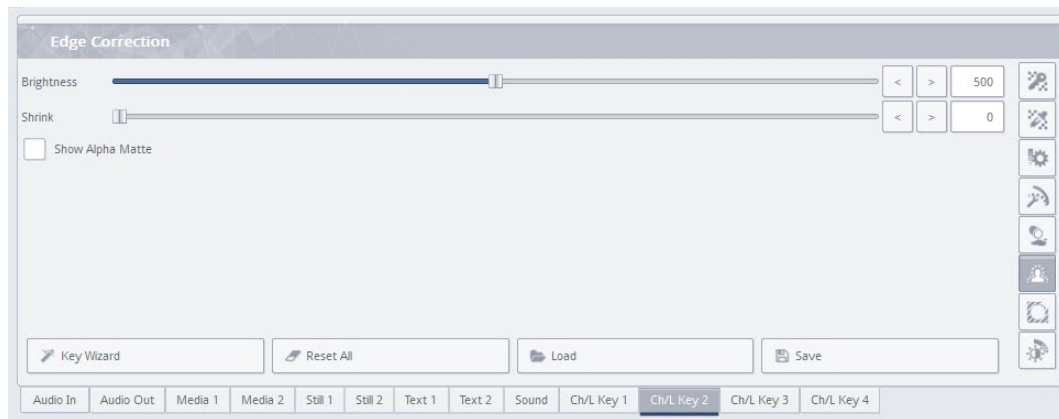
After using the [Despill Coarse](#) function, which is an initial correction, the next step is to operate on the precise values. In the case where the [Despill Coarse](#) function was set at a high level, any changes in [Despill Fine](#) function settings may be of little significance to the algorithm.

Picture below: impact of a background on an object -a view after the correction: [Despill Fine](#).



EDGE CORRECTION

Edge Correction is an additional correction that improves the keying quality.



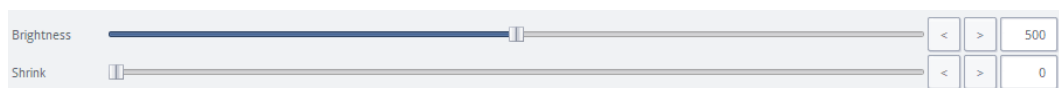
Click on the icon [Edge Correction](#) in order to open a window.

The [Brightness](#) function is responsible for correction of the semitransparent areas (like a correction of hair tips that should be [darkened/brightened](#)), affecting the image's natural effect.

The [Shrink](#) function is responsible for reducing the object's contour by softening it.

This is especially important for certain types of cameras, image from which can produce a white line around the object. It is possible to remove it with the [Shrink](#) function. You can also use it in the cases where keying is difficult in some places, due to the properties of the object's edges or lighting. Be careful not to trim the edges of the object too much, so that it doesn't look unnatural.

The picture below - a bar with functions: [Brightness](#) and [Shrink](#)



SETTING THE MASK'S AREA – GARBAGE MASK

This is a function used to cut off (reduce) the area of the mask (in all possible directions: [left](#), [right](#), [up](#), [down](#)).

The picture below - a window with sliders: [Left/Right](#) and [Top/Bottom](#).



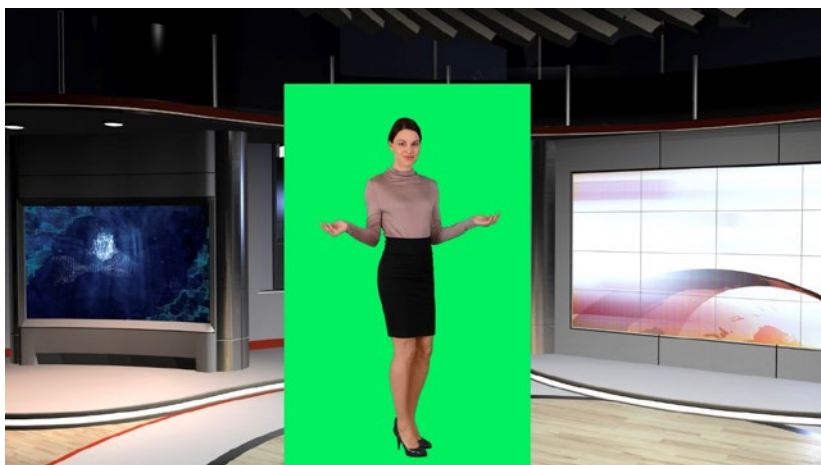
This function is used in the case where the view of the **keyed background** is not large enough to fill out the entire camera image.

A view of the camera's image area



You can set the object in the keyed background's area by cutting off the remaining elements with **Left/Right** and **Top/Bottom** sliders.

The picture below - a view after the correction of the mask's area with the keying algorithm off.



Once chroma key is enabled, you get the following effect:

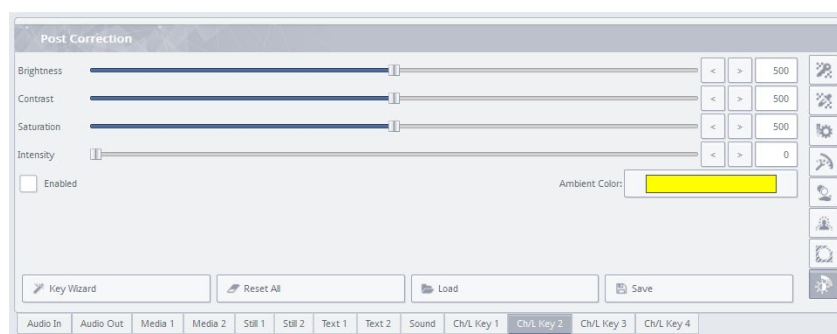


Attention! Please note that, in this case, the object can move only within the area of the cut off mask - otherwise the object will disappear.

What's more, if you use the mask's area sliders, you can verify whether your previous settings were correct and whether they had any impact on the final appearance of the virtual background. By moving e.g. **Left** slider to its maximum, you should not encounter any noticeable noise, change in color or a in grayness of the background.

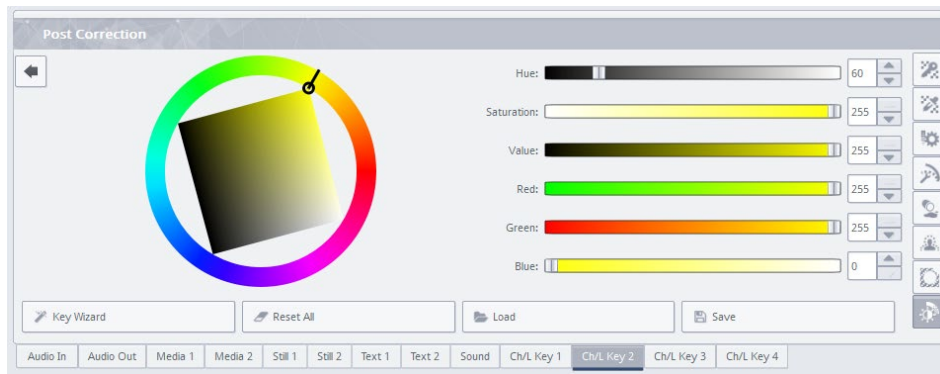
POST CORRECTION

To enable this function click on the **Post Correction** icon. This function allows you to adjust the object (a talent) to the lighting conditions of the virtual background. The post-correction, carried out with the sliders, will only concern the object (a talent) and so it will have no effect on the virtual background.



- **Icon: Enabled** - check this box to enable or disable the Post Correction.
- **Slider: Brightness** - this is a feature that allows you to bring additional brightness of the color into the talent's image.
- **Slider: Contrast** - this feature allows you to increase contrast between colors.
- **Slider: Saturation** - this is a feature that allows you to increase color saturation.
- **Color box: Ambient Color** - this feature enables bringing the scene (ambient) color component into the talent's image.
- **Slider: Intensity** - this is a feature that allows you to set the intensity of the ambient color.

The **Post Correction** functions are used to adjust the **object (a talent - a figure of a presenter)** to the background. This is possible by incorporating an additional component of a color already dominant in the virtual image. For example, when a background of a sunny beach is put under the discussed above **object (talent)** in the studio, you should add a yellow color (dominant color of sand and sun that affect the object) as **Ambient Color**. When you click on the **Ambient Color** icon, a color wheel window, where you select the exact color and hue, will open.



The color wheel shown in the picture above is based on **RGB (Red, Green, Blue)** model extended by **Hue, Saturation, and Value**.

The color can be set with the sliders available on the right side of the screen:

Hue - the hue parameter corresponding to the colors on the edge of the color wheel - from 0 (red), through 120 (green) and 240 (blue) to 360 (red), - by changing the value of the slider, you change the position of the dash marker on the wheel.

Saturation - the value of saturation parameter lays in a range of 0 (white) to 255 (100% full saturation), by moving the slider, you change the position of the black circle along one of the sides of the square.

Value - the brightness parameter that lays in the in the range of 0 (black) to 255 (100% bright color of a given hue and saturation), by moving the slider, you change the position of the circle along one of the sides of the square.

You can also set all of these values with a cursor. You just need to hook the cursor on the dash marker. Changing the marker's position on the wheel allows you to set the color by setting its Hue parameter. When you hook the cursor on the black circle, you can move this circle inside the square. This allows you to change all the remaining parameters. The current color will be visible in the middle of the black circle.

You can adjust the object to the conditions in the scene by setting the options of **correction functions** with the sliders. The figure of a talent will then gain a natural appearance.

After setting the key in this mode, you can save all of your settings to a file on your hard drive by clicking on the icon: **Save** in the lower right corner of the window.

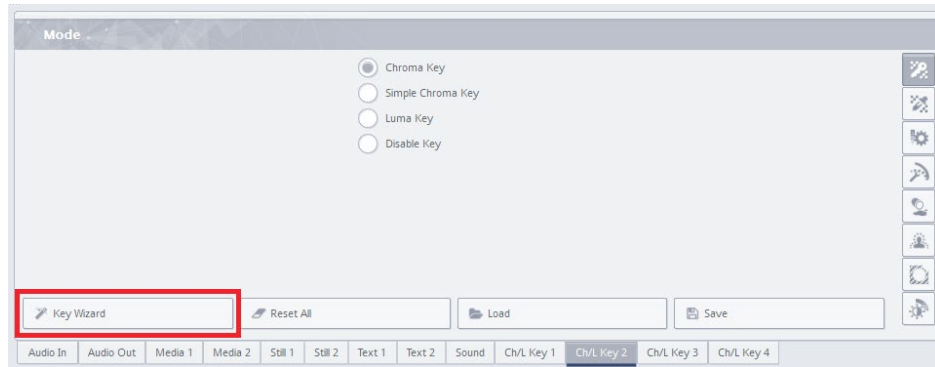
The **Reckeen 3D Studio** system has its own **key files - *.recKey**. If the lighting conditions, hardware, etc. in the studio remain unchanged, then going back to the production screen, you can load your key's settings from a file by clicking on the icon: **Load**.

CHROMA KEY WIZARD

You can access this function by clicking the **Key Wizard icon** at the bottom left side of the window.

The **Key Wizard** allows you to set the key with taking advantage of the instructions in the key wizard's

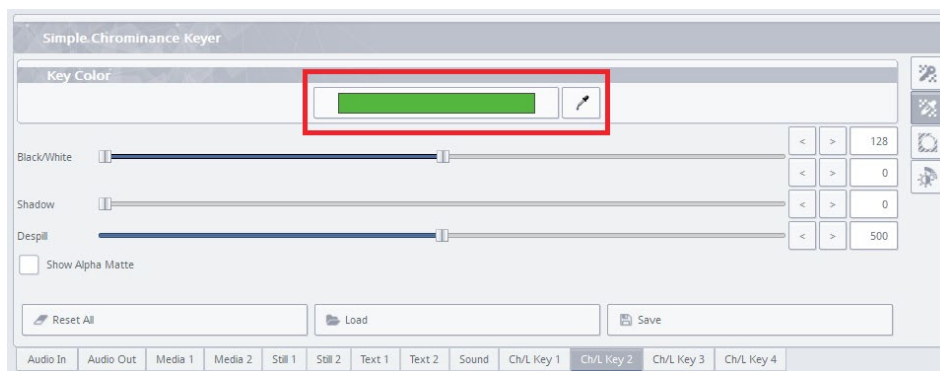
window. The [Key Wizard](#) will guide you through all the 6 steps of setting the key, suggesting which actions and when to perform.



SIMPLE CHROMA KEY MODE

You can use a simplified version of the [key settings](#) by checking this mode in the window.

When you click on the button [Simple Chrominance Keyer](#) below the highlighted [Mode](#) button, a window with a simplified key settings opens up. The background color is selected with a probe. Clicking on the [Pick color](#) icon or on a color bar next to the icon, opens a window of a camera preview. Then, you have to select a location with a cursor and click there. The program will automatically sample the color as the background color and present it in the color box next to the probe icon. The picture below.



The remaining number of sliders is limited to three: [Black/White](#) slider, [Shadow](#) slider, and [Despill](#) slider.



The [Shadow](#) slider is available only in the [simple](#) version of the key. There is a possibility of creating a shadow of the presenter, especially visible around the feet of the character, on the basis of incident light in the [Green/Blue](#) Screen studio. First you have to set the lighting so that, to get the shadow of the presenter on the green screen in the studio (on the floor in the studio). Then you can place this shadow on the floor in the virtual studio with [Shadow](#) slider. You can boost this shadow with the [Shadow](#) function. Picture below

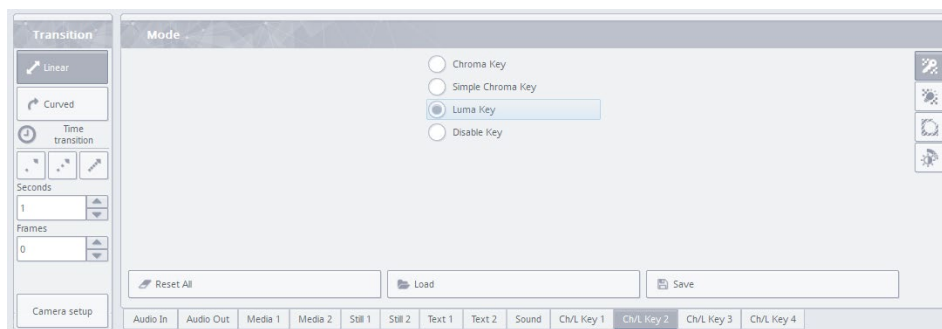
Just as in the precise key mode, also in the simple mode you can turn on and off the mask by checking the [Show Alpha Matte](#) option.

The only thing left to do is to set the talent's image post correction, just as with the precise key described earlier. All the other options are already automatically selected by the Reckeen 3D Studio system.

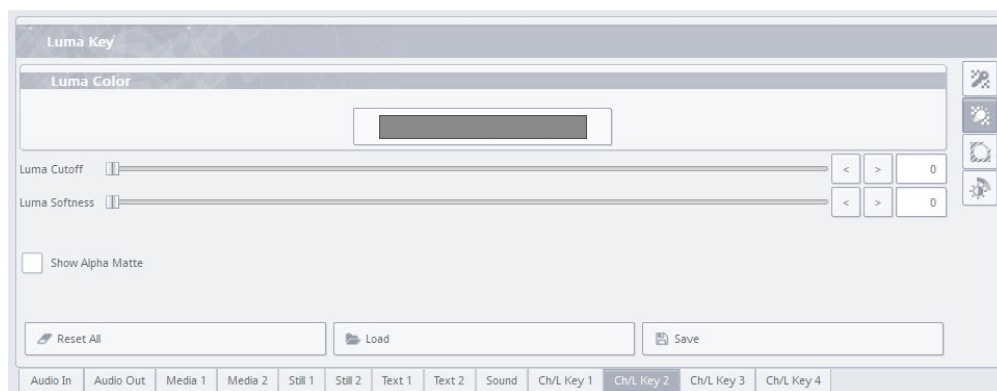
Also when you apply a simple key, you can save your settings to a *.recKey file using the **Save** function. **Save** icon is at the bottom right of the screen (as shown above).

LUMA KEY

The previously discussed key operating modes were based on a **chromatic keying**. In most cases they will be sufficient for the user. But the Reckeen 3D Studio system also allows keying based on **luminance**. The picture below.



When you select this mode and click on the first icon, you will see the following functions in the window (picture below):



Box: Luma Color - clicking on the box allows you to select the keyed background color in the scope between white and black,

Icon: Show Alpha Matte - a feature that allows you to enable or disable a view of a mask, where the represented image is shown in a gray scale, where:

- **black color** is a completely transparent area,
- **white color** is a completely opaque area.

Slider: Cutoff - this is a function that allows widening the range of transparent colors by luminance similar to the luminance of the reference color (white or black).

Slider: Softness - a function that, taking the luminance into account, enables widening the transition

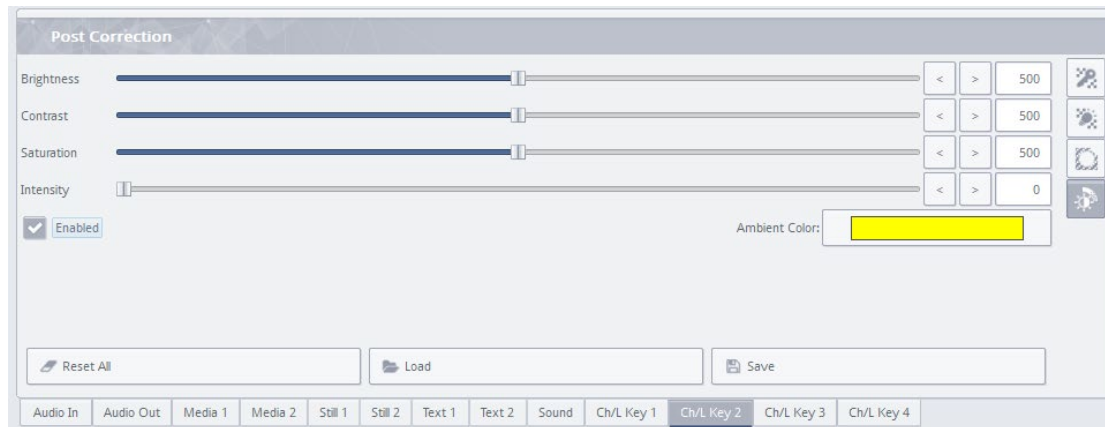
scope between the range of colors completely transparent and those fully opaque.

As before, you can save your settings to a [*.recKey](#) file to load them again in the future.

Also as before you have the functions [Garbage Mask](#) available.

In the luminance key mode, you can go to the tab: [Post Correction](#) and, just as before, introduce the changes in the view of the [object \(talent\)](#).

The picture below.





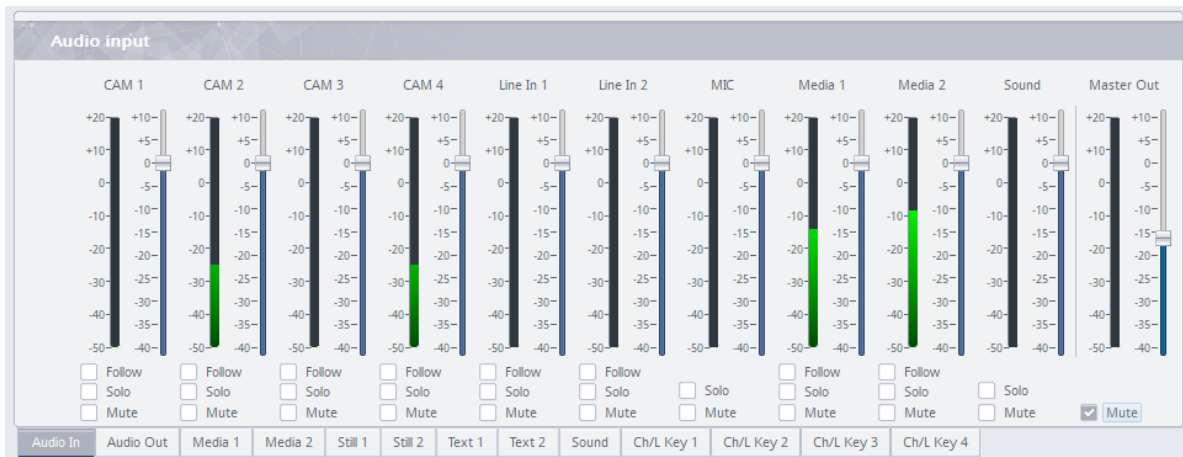
Sound mixer

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The **Reckeen 3D Studio** system is equipped with a **sound mixer** function. It allows you to mix the audio signals. It also gives you a possibility to adjust a signal level of each of the sources, along with a separate adjustment of the signal level for audio output. The sound mixer on the **3D Production** screen represents three tabs. **Audio In**, **Audio Out**, **Audiobox**.

AUDIO IN TAB

Below is picture with audio inputs



In the **Reckeen 3D Studio** system, you can adjust the following input channels:

- **Cam 1 Input**, the signal received from the first card input,
- **Cam 2 Input**, the signal received from the second card input,
- **Cam 3 Input**, the signal received from the third card input,
- **Cam 4 Input**, the signal received from the fourth card input,
- **Line In 1 (XLR)**; the signal received from the front audio panel,
- **Line In 2 (Jack 6,3 mm)**; the signal received from the front audio panel,
- **MIC – signal from microphone (Jack 6,3mm)** the signal received from the front audio panel,
- **Media 1** - input channel of video files played back by a virtual player supported by a media tray - Media 1 tab
- **Media 2** - input channel of video files played back by a virtual player supported by a media tray - Media 2 tab
- **Sound** - input channel coming from sound files played back by a virtual player and being placed in the Sound tab,
- **Master Out** - adjusting the main signal level for audio output. For better operation, the Master Out indicator is also included in the audio input tab.

AUDIO OUT TAB

Below is picture with audio outputs



You can adjust the following output channels:

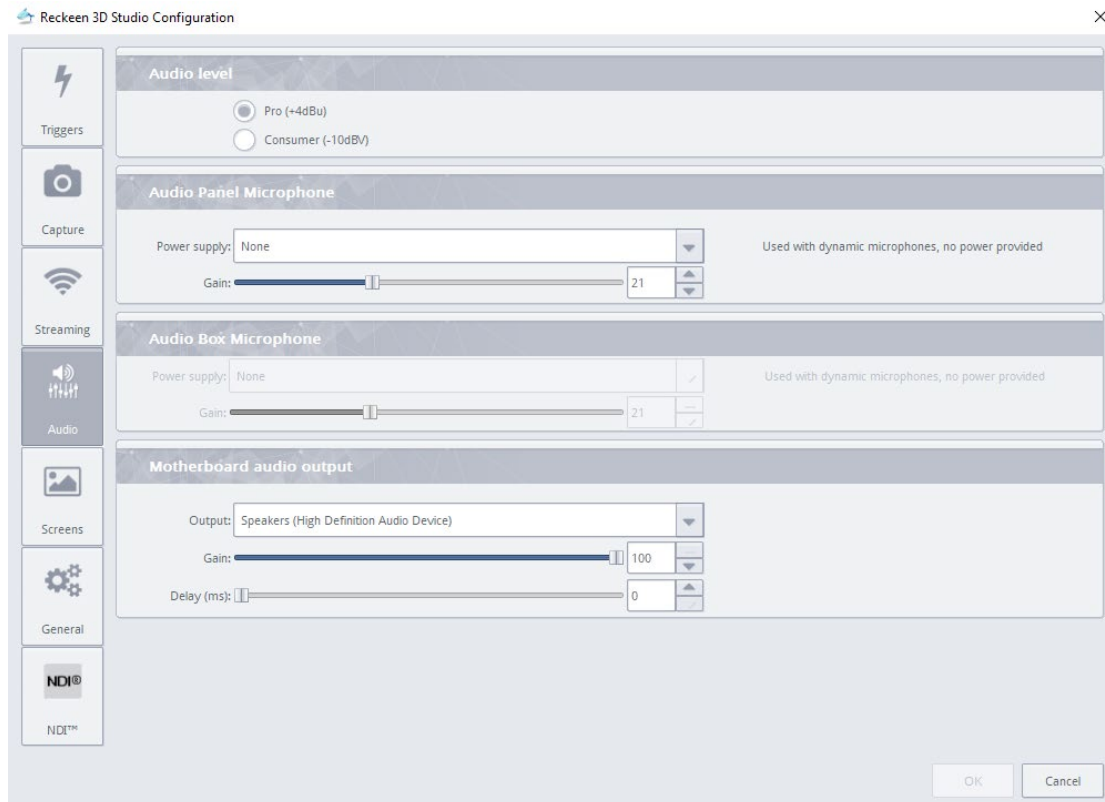
- **Capture** - setting a volume of a video file recorded from the **Program** window level. The file being recorded is automatically placed in **the tab 5 of Media 1 and Media 2** trays.
- **Streaming** - setting the volume of a live broadcast streaming from the **Program** window level.
- **Headphone – (Jack 6,3 mm)** when connecting headphones, you can select from the drop-down list which channel you want to hear on the headphones .
- **NOTE:** The Mute function works for each input source and the master output. Selected sources are mixed, and create a Master Out signal. On the Headphones you can hear the signal from any input or Master Out output. In this case, the Mute function will not work for the Headphones, despite the checkboxes are on . You can listen any channel on the Headphones with Mute function enabled .
- **Master Out** - adjusting the main signal level for audio output.

For each channel, you can adjust the signal level using a slider located next to the signal level column. In addition, you can set the output level with a separate slider - **Master Out**. You can adjust the sound in the range of **-40 to +10 dB**, where the **0 level (Line In 1,2)** corresponds to **-10 dBV (-7.8 dBu or 0.316 V RMS)** in case on consumer level , or **4dBu (1.78 dBV or =1.23 vltS RMS)** in case professional level analog inputs/ outputs on audio panel. It depends on audio level setting in **Configuration Window: Audio Tab**. This has been described on the next page.

In case digital **Audio input /output (Camera Input)** 0 level corresponds to **-20dBFS**. Level 0 for the Media file means the maximum digital value of the signal. In addition, you can enable for the channels the following:

- **Follow** - this feature allows you to mute the sound of a chosen channel up until a video signal associated with the given sound source appears on the vision. This applies to the sources: **Media 1**, **Media 2**, and **CAM** associated with the **Line In (Line in 1 when CAM1 appears on the vision and Line in 2 when CAM2 appears on the vision)**. Enabling this feature for a chosen channel mutes a given sound source, when the source is not used (displayed) on the **PRG output**.
- **Solo** - a feature that enables sending a selected signal individually to the output. Enabling this feature for the chosen channel mutes all the other input channels. Only the signal for which the **Solo** feature has been enabled is sent to the outputs.
- **Mute** - checking this feature completely mutes the signal of the given source.

CONFIGURATION WINDOW : AUDIO TAB



When you open [Configuration Window](#) in 3DProduction Module or LITE Production Module: [Menu>Options>Configurations](#). In the **AUDIO Tab** - you can find settings of the system's sound. There are two levels of the line signal to choose from:

- The first one - **Pro** - is a professional one, where level 0 has a value of +4 dBu. This signal level is the most common for the **XLR** connector, commonly known as **Cannon**, and for the **TRS** connector, that is **6.3 mm stereo Jack**. You may also find it on the **TS** connector.
- The second signal level - **Consumer** - has the 0 level for the value of - 10 dBV and it is most common for the **RCA** connector, commonly known as **Cinch**. The difference between them, are described below.

Different voltage reference levels have been chosen for **Pro** and **Consumer** levels.

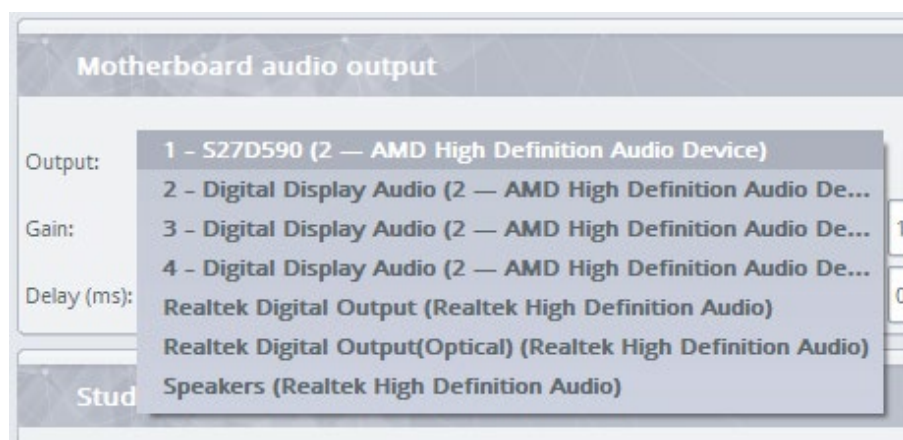
- **Professional** level:
4 dBu, then we get level 0 on analog inputs and outputs. This equals 1.23 V.
- When working with **Consumer** signal, in order to get 0 value on the output and on the input, a signal with a value of 0.32 V has to be connected. These principles apply to the **AUDIO Panel** connectors at the front of the Reckeen workstation and analog connectors in external AUDIO BOX panel(ADB-100). In the case of digital inputs and outputs, such as a camera, level 0 is a level of - 20 dBFS. Level 0 for the **Media** file means the maximum digital value of the signal.

CONFIGURATION WINDOW : AUDIO TAB -MICROPHONE

You can find two **Microphone** settings below the **AUDIO Level** settings. The first for the microphone connector located on AUDIO PANEL on the front of the Reckeen workstation, and the second for the microphone connected to external AUDIO BOX panel (ADB -100). There are two operating modes: a **None** mode with a dynamic microphone, for which you can set the **Gain** value with a slider, and a **Phantom** mode with a condenser microphone. When you switch to the **Phantom** mode, you will be warned that a voltage of **48 V** will be applied to the speech insert. A red **LED** lights up on the **AUDIO Panel** located at the front of the Reckeen workstation.

Warning ! It is recommended not to connect or disconnect a microphone to the AUDIO Panel during the time the red LED is lit up. You can safely connect a microphone only in None mode.

Below **Microphone** settings, you can see the settings options of **Motherboard AUDIO Output**. The available outputs are shown in the drop-down list.



On the drop down list, you can select the audio output from your graphics card or motherboard. They will vary depending on the system configuration and the type and number of connected monitors.

The list of monitors attached to the system will appear in the drop down list. (Item **# 1** in the list in the image above). If you select this monitor from the list then the sound can be played through this monitor (you can connect, for example, headphones to this monitor)

Digital Display Audio - output sound from the graphics card (you can select the sound output on different connectors of the card, such as **HDMI**, **DVI**, **DP**), In the picture above, **points 2, 3 and 4** in the list.

- Realtek Digital Output - is a digital output from the motherboard.
- Realtek Digital Output (optical) - digital (optical) output from the motherboard.
- Speakers (Realtek High Definition Audio) - mini Jack output from motherboard. If you choose this option, a signal from **Master Out** will go to the output on the rear panel of the Reckeen workstation.

Adjust the audio delay relative to the video output for proper synchronization. With the slider **Delay** you can set the delay (in **ms**) for the audio signal going out of the system and with slider **Gain** - the volume.

AUDIO BOX ADB-100



If you connect an additional ADB-100 device to Audio Link connector, you can expand the Reckeen system adding additional inputs and outputs:

- two digital inputs on XLR connector (AB Digital 1, AB Digital 2)
- two analog inputs on XLR connector (AB Line In 1 stereo, AB Line In 2 stereo)
- microphone input for dynamic and condenser microphone
- two digital outputs on XLR connector
- two analog outputs on XLR connector (stereo output 1, stereo output 2)
- stereo headphone output

Warning !

It is recommended not to connect or disconnect a microphone to the ADB-100 during the time the red LED is lit up. You can safely connect a microphone only in None mode.

An additional ADB-100 tab appears automatically after connecting the device to power supply and communication cable.

A sound from system's MASTER OUT is always supported on the digital outputs: AB Digital 1 and AB Digital 2 and on the analogue outputs: AB Line 1 and AB Line 1.

When you set a headphone source with a drop down list, you set it jointly for AUDIO Panel and AUDIO BOX headphone outputs.

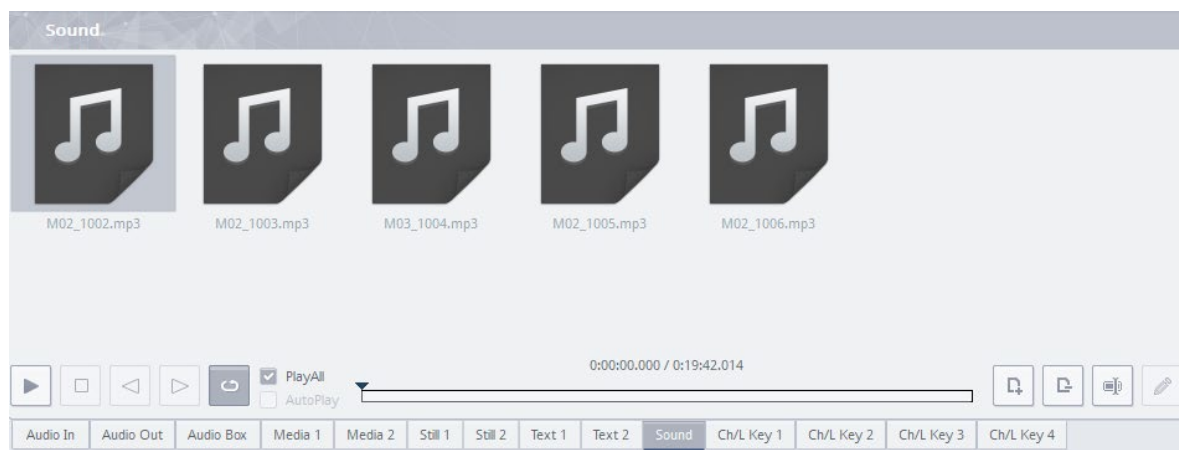
You can adjust the sound in the range of -40 to +10 dB, where the 0 level (AB Line In 1, AB Line In 2) corresponds to -10 dBV (-7.8 dBu or 0.316 V RMS) in the case of a consumer level, or 4dBu (1.78 dBV or =1.23 volts RMS) in the case of a professional level analog inputs/outputs on ADB -100 panel. It depends on audio level settings in Configuration Window: Audio Tab.

In the case of digital Audio input /output (AB Digital 1,2), 0 level corresponds to -20dBFS

SOUND TAB

In the [Sound](#) tab, you can store shortcuts to audio files previously added to the hard drive, just as in the media tray.

Click on the icon [Add](#) (with small plus sign) to browse your local hard drive and add sound files.



Supported audio file formats: [.wav](#) and [.mp3](#)

In the mixer, you can add music played in the player to an audio track and adjust its volume with a [Sound slider](#).

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Capture function



The Reckeen 3D Studio system uses [Intel Quick Sync Video](#) technology, built into some of the [Intel](#) processors. This allows for hardware acceleration of a video stream encoding.

[Capture](#) function allows you to use the Reckeen 3D Studio system as a [Video Recorder](#). It allows you to record the signal broadcasted by the system on the internal hard drive. The produced program on the air can simultaneously be [saved](#) to a file on the disk in [*.mp4](#) format ([codec H.264](#)) or [*.mpeg](#) format ([codec MPEG-2](#)). The resolution and frame rate is chosen depending on the mode, in which the system output operates. On the right side of the [Capture](#) button, you can see an icon with gears for configuration of this function, a light indicating the recording, a recording timer ([hours/minutes/seconds](#)) and the amount of free disk space ([in GB](#)). When you start recording, the red light lights up and the [Capture](#) button is highlighted.



The Reckeen 3D Studio system supports the following image formats (codecs):

- H.264 video / AAC audio
- MPEG-2 video / mp3 Layer 2 audio

The list of formats supported by the aforementioned codecs:

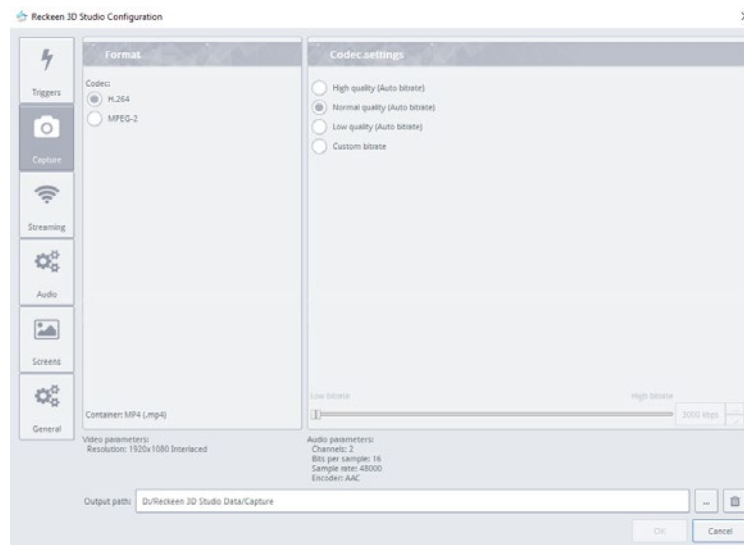
- 2160p30 / 29.97 / 25
- 1080i60 / 59.94 / 50
- 1080p60 / 59.94 / 50/30 / 29.97 / 25
- 720p60 / 59.94 / 50

4K RECORDING

When you are recording in 4k format, a different bitrate is needed to obtain a recording quality similar to one in HD format. When the user is going to work in FULL HD resolution and sets a Custom slider (defined by the user) to the codec's maximum value, e.g. 25000 kbps, afterwards saves such settings in a session file and loads such a session in 4k format, then the slider will also be set to the maximum value, but this time equal to 45000 kbps for the 4k format.

Using the 4k format you cannot record a file with MPEG codec. In the case of operating the Reckeen system with 2160p format, the H.264 video / AAC audio codec is available.

By clicking on the icon [Configure Capturing](#) (with gears, on the right side of the [icon Capture](#)) , a window with [Capture](#) function configuration opens up.



Now, in the [Format](#) box, you can choose the type of the codec. The size of the files recorded on the hard drive can be controlled by the choice of compression. You can choose [low, medium or high quality](#), or a [quality defined by the user](#). In the first three cases, the system will automatically adjust the [bitrate](#). Selecting a [bitrate](#) field allows you to set the desired value of the recorded file's [bitrate](#). In addition, it is possible to specify the location of the recorded file on your hard drive.

When all the parameters are set, close this window. To start recording simply click the [Capture](#) button, which will then change its color. To stop the recording, press the [Capture](#) button again. After recording is finished, a shortcut to the recorded video file will be added to tab 5 of [Media 1](#) and [Media 2](#) tray. Picture below.





FX

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OUTPUT TRANSITION

The Reckeen system's production module comes with the main mixer that has buttons corresponding to full-screen views of the virtual studio VC (from 1 to 4), video content or graphic materials. Program channel is used for full-screen display of live material ready to be streamed to the end user. Preview channel serves as an aid in production and in preparation of materials before displaying them on the air. Two methods for changing these channels have been described so far, one via TAKE function - immediately - and the other via AUTO with MIX function, which means smoothly. The following section introduces a new function called AUTO FX, that is special effects. The Reckeen system has a large database of ready-to-use effects divided into appropriate categories.

To select the desired effect, select FX button instead of MIX button in the Production module window, it will then light up in blue as in the image below.



In fact, when you press AUTO button, you can execute a default transition effect displayed in the thumbnail above. The effect is depicted with two letters. Capital letter A represents a full-screen view before the start of transition, while capital letter B stands for the view after the transition is completed. To make identification of the effect easier, the thumbnails have been created for the moment the transition is half-way through. This effect can be seen when the transition's T-bar is located half-way up its value.

In such moment, in the Program channel you can see a reflection of the currently set effect, e.g. Wipe 1. The image below.

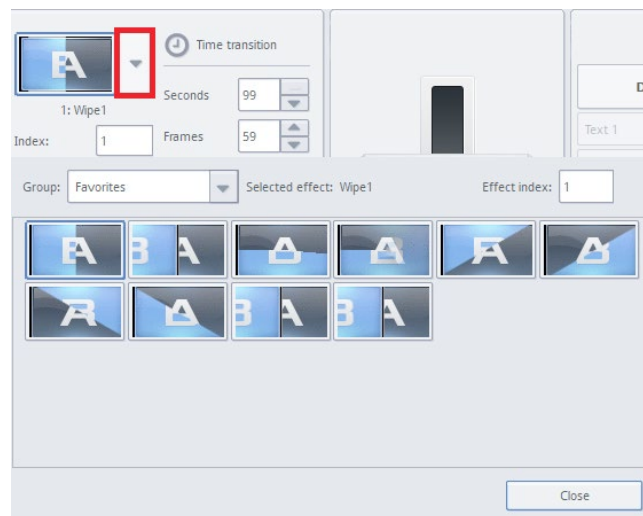


After hovering the cursor over the thumbnail, the thumbnail's animation starts showing an example of how the switch between the main mixer's PROGRAM and PREVIEW channels will look like.

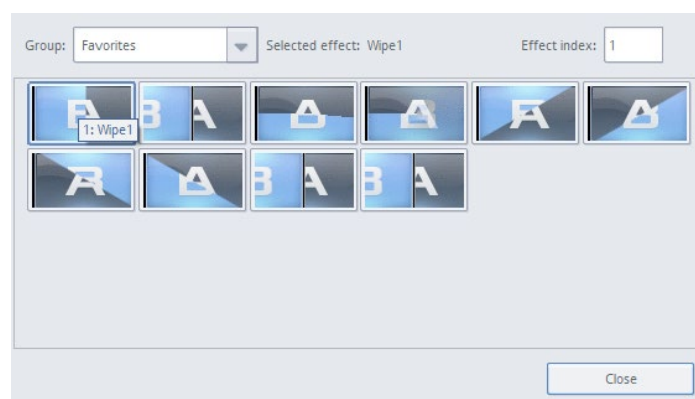
The effect's reference number is displayed below the thumbnail, and its name comes after a colon. Each group of effects has its appropriate individual number range assigned. For example, WIPE effects start at 1, while SLIDE effects go from 100 and so on.

Here, you can also set a transition time between channel A and B using controls in TIME TRANSITION section. A transition time can be adjusted in seconds from 0 to 99 or in image frames that depend on the output format.

You can change the currently selected effect in several ways. The first one is by pressing a downward arrow which results in opening a new window.

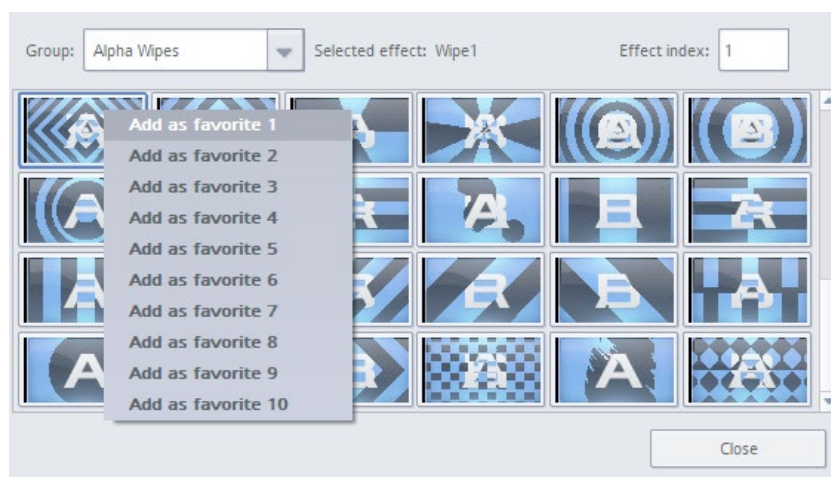


After pressing the button, a new window opens showing the available database of transition effects. The last selected category opens as a first one. By default, this is FAVORITES category. You can find 10 items there that can be modified by assigning other effects at any time. As mentioned earlier, when you hover the mouse cursor over any thumbnail, an animation will start showing how the transition will behave, but not only that. After a while, a tooltip appears with a number and, after a colon, a name of the effect. With a single click of the left mouse button you select an effect which will immediately replace the one in the Production module. All you need now is to press CLOSE button and close the window. Another way to choose an effect is simply to double click on the effect's icon. The window will close automatically then. The image below shows the effects window.



Each effect has its own unique number, which can also be used for selecting the effect without the need to search the list. You need to enter the appropriate number (e.g. 258) in the EFFECT INDEX control field, and press Enter to confirm the choice. Entering a value "000258" will confirm selection of the effect with a number 258.

In the Group drop-down list you can find a database of categories corresponding to individual effects (WIPE, SLIDES, ALPHA WIPE, ALPHA SLIDES, etc.). To select an effect, just press the left mouse button. To add the selected effect to FAVORITES group, you have to bring up a menu with a right-click and indicate a target position in the category.



In the Reckeen 3D Studio system, you can adjust the following input channels:

- **Cam 1 Input**, the signal received from the first card input,
- **Cam 2 Input**, the signal received from the second card input,
- **Cam 3 Input**, the signal received from the third card input,
- **Cam 4 Input**, the signal received from the fourth card input,
- **Line In 1 (XLR)**; the signal received from the front audio panel,
- **Line In 2 (Jack 6,3 mm)**; the signal received from the front audio panel,
- **MIC – signal from microphone (Jack 6,3mm)** the signal received from the front audio panel,
- **Media 1** - input channel of video files played back by a virtual player supported by a media tray - Media 1 tab
- **Media 2** - input channel of video files played back by a virtual player supported by a media tray - Media 2 tab
- **Sound** - input channel coming from sound files played back by a virtual player and being placed in the Sound tab,
- **Master Out** - adjusting the main signal level for audio output. For better operation, the Master Out indicator is also included in the audio input tab.

EFFECT'S TRIGGER

For your convenience, we have prepared a special trigger which allows you to choose your favorite effect without the need to search the database. Going to OPTIONS and CONFIGURATION menus, you come across TRIGGERS tab. It is possible to program 10 keys in the advanced mode there, e.g. F1 key. In the settings' parameters you have to select whether a transition should be carried out in MIX mode (smoothly) or with FX effects. Choose a category of your interest and indicate a specific effect in the fields below. The image below shows an example of a programmed Trigger.



You have to remember that this function's purpose is to set a given effect in the Production module. After its execution, a corresponding effect's thumbnail appears in the Production module, ready for use. In order to program both selection of the effect and immediately calling upon this transition effect, a second function under the name OUTPUT TRANSITION AUTO has to be added to the list. As a parameter, time of transition should be given, in seconds or in frames that depend on the system's output format. The example is shown in the image below.

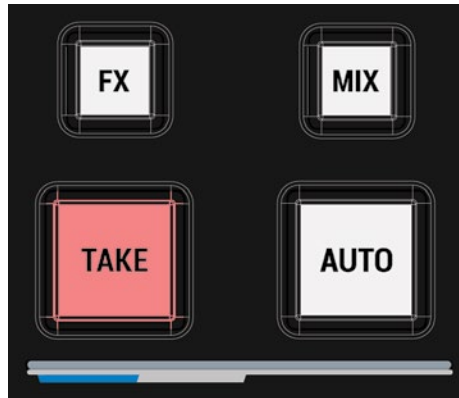


10 favorite buttons can be programmed this way. Then, by pressing one of them in the Production module, you can execute a transition between the Preview and the Program channel. Such programmed Trigger can be stored in the Production module's session file.

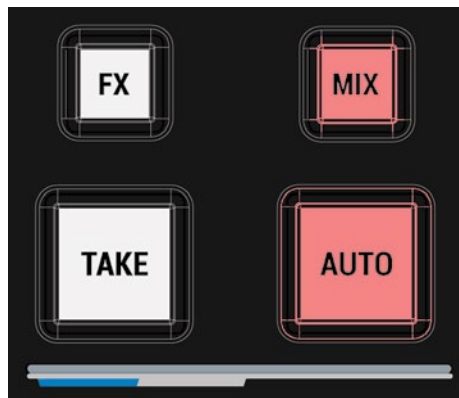
VKEY-100 KEYBOARD

We have prepared suitable buttons on the Vkey-100 keyboard. Their purpose is to indicate the transition's type. It is possible to perform a transition in several ways using the Vkey-100 keyboard.

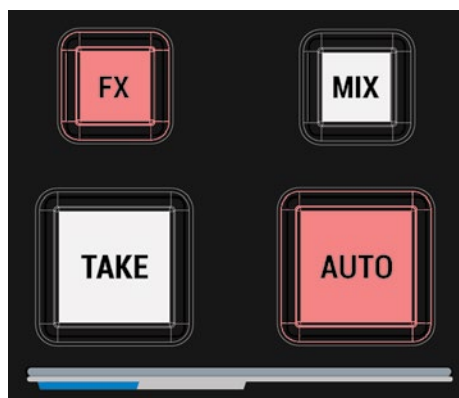
- Manually using a T-bar handle.
- By pressing TAKE button - starting an immediate transition.



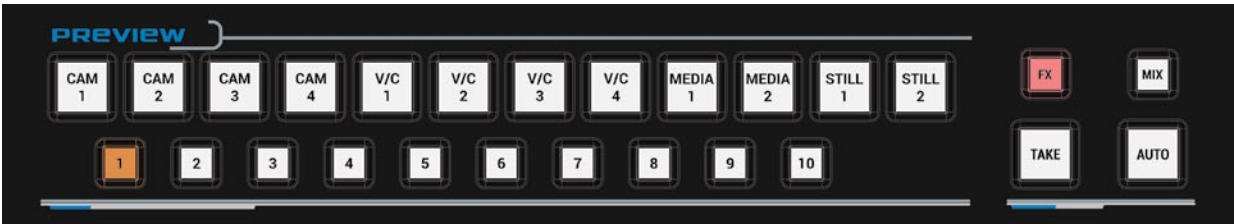
- By pressing AUTO button having MIX option button selected - starting a smooth transition with a programmed time.



- By pressing AUTO button having FX option button selected - starting a smooth transition with a programmed time and an effect selected in the Production module.



If you press and hold FX button, 10 keys will light up in the PREVIEW section of the Vkey-100 keyboard. If, at the same time, you press one of those buttons, an effect from FAVORITES category will be selected.



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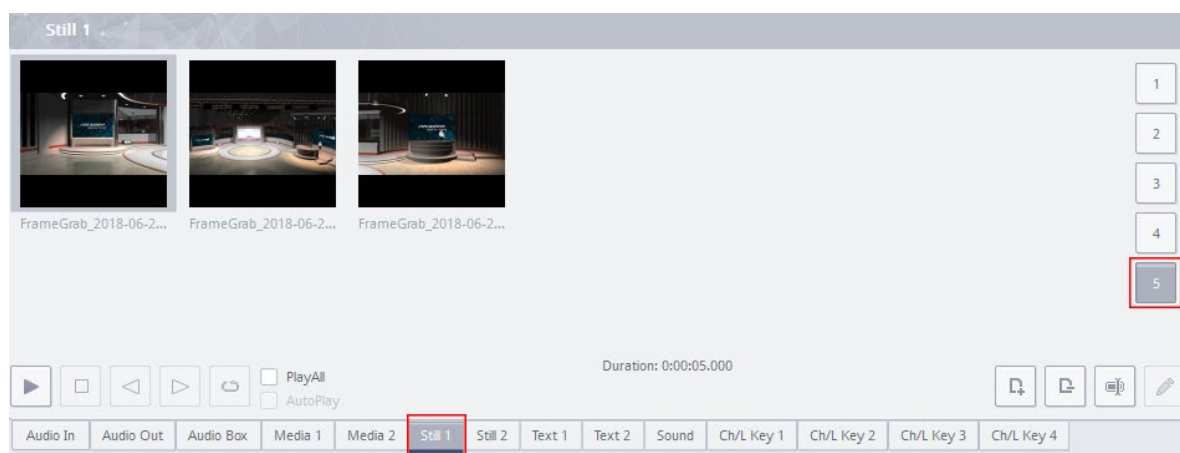
Still Grab function

This function enables capturing single frames from the **PROGRAM** screen image, with a possibility to save them to a file in **PNG** format.

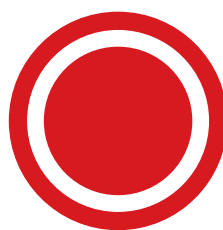


Depending on your **vision mixer's** (Production switcher's) settings, it is possible to capture frames from both live broadcast of the program and the media sent to the broadcasting output.

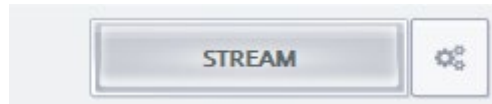
Captured frames can be used as a material to create programs. **Still/Grab** will not only save the captured frame to a file on a disc, but it will also add it (or rather a shortcut to the file) to **Still 1** and **Still 2** media tray. With that, a captured frame is immediately ready to be used. You can use it directly on the vision or as one of the sources. (Below, you can see a picture with captured video frames: the system writes date and time in the name of the file and puts files shortcuts in **tab 5**)



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Video program Streaming
function



Streaming function allows you to send a broadcast signal over the Internet in the form of a data stream. With this feature, the program realized live immediately reaches all its viewers, even at distant locations in the world. **The Reckeen 3D Studio** system is a crucial link for this type of projects, as apart from creating a broadcast signal, it makes it available in the form of a data stream. With an appropriate software you can upload the stream to a server that supports streaming. The server allows you to make the signal available to many viewers simultaneously. Watching such broadcast is possible on any device with a web browser, e.g. a [PC](#) or a [tablet](#).

To carry out an internet broadcast you need to:

- have a source signal - it is provided by the [3D Production](#) module,
- convert the signal to a format suitable to the capabilities of your Internet connection,
- broadcast it on the web by clicking the [Stream](#) button, as shown above.

To configure the streaming, open the configuration window with the [Configure Streaming](#) gear icon located next to the [STREAM](#) button. Then, set the data stream's video and audio parameters. With that done, you can enter the individual address and the key you had obtained after registering at the chosen service enabling streaming, that is, allowing multiple users to view the material simultaneously.

Before you start streaming your program with the Reckeen3D system, you should check your internet connection. There are two basic definitions in the specification of an Internet connection, that is [download speed](#) (receiving the data) and [upload speed](#) (sending the data). You need to have an Internet connection with an appropriately high [upload](#) parameter, which on the market is usually much lower or at maximum at the same height as the download parameter.

Different suppliers, such as Ustream and YouTube, usually provide the parameters recommended to work with the system on their websites. But you have to take care of the state of your connection. Typically, if you want a video of an acceptable quality, the minimum recommended speed of sending the data (upload) is approximately [2 Mb/s](#).

In our application, we used the parameters 'bitrate' and 'resolution', that together define the quality of the broadcast image. The higher the bitrate set in the Reckeen3D system, the faster the Internet will be required. This Internet connection should be used only for streaming. In the case of a shared connection, other users may interfere with your transmission.

To find out whether your connection is sufficient, it is recommended to do a couple of tries before you start streaming your live image.

First, launch [3D PRODUCTION](#) module in the Reckeen3D, then click on [Options](#) and then on [Configuration](#) and [Streaming](#). Before you start your first broadcast, you should test all the Audio and Video Settings to check with which maximum quality you can stream using your Internet connection. Streaming bitrate cannot exceed the available bandwidth of transmission. What's more, it should not be even close to that value. After checking, you should better add further [20%](#) bandwidth as a safety margin. For example, when you have an internet connection with the upload parameter of [2.5 Mb/s](#), it is recommended to set the bitrate to [2000 kbps](#) and so on.

Providers make available on their websites the proper tools for testing the Internet connection. You can easily find them by typing in the search engine: '[Ustream's Network Test Tool](#)'.

Remember that not all the connections are of the same quality and condition. For example, a wire

connection is much better and more stable than a [WIFI connection](#), which is more prone to fluctuations in quality and can be easily interrupted. When you have a shared connection, other users can disrupt the broadcast.

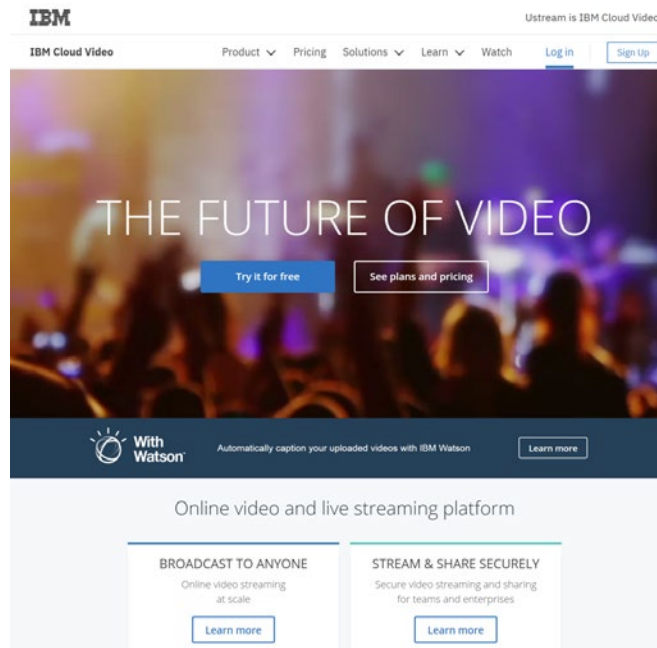
For those less experienced, we recommend contacting the IT department of their company, as it may be necessary to open the network ports needed for broadcast ([port 1935](#)).



Streaming on Ustream
platform

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Create an account on Ustream platform using the [SIGN UP](#) button. Picture below



In the following steps, you should provide some basic data necessary for the registration process.

Sign up for your 30-day free trial

Ready to buy? [See our plans and pricing](#)

First name Last name

Email

Password

Password should be at least 5 characters and should contain at least one lowercase letter, one uppercase letter and one number.

Phone number

Company name

[Sign up](#)

By signing up, you agree to the [Terms of Service](#) and [Privacy Policy](#).

Once you have set up your account you can login to it

Log in to Ustream

[f Log in with Facebook](#)

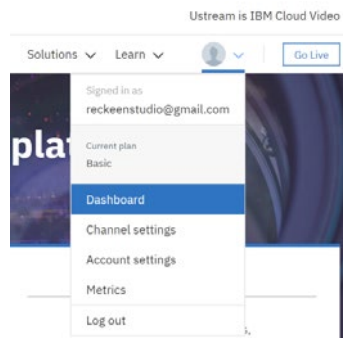
Instant login, no passwords

[Log in](#)

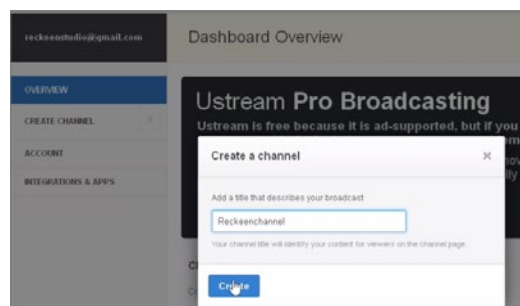
OR ☒ Remember me | [Forgot your password?](#)

Don't have an account? [Sign up](#)

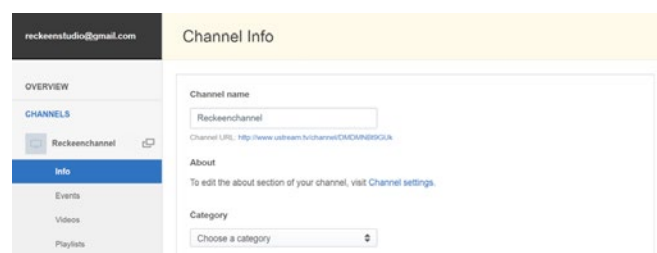
First, on the drop-down list, click on the [dashboard](#) option.



Then, in the [Create channel](#) tab, set your own [channel name](#).



The name of the channel, will be available to the user, i.e. this name will be commonly used as a link.

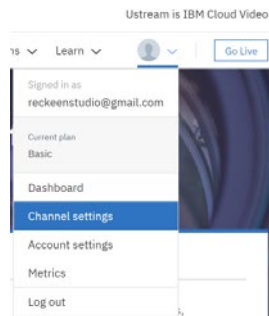


Now, your streaming channel has been successfully created. You can go back to the Reckeen3D system. In Reckeen3D, start the [3D Production](#) module, click on [Options](#) and then on [Configuration](#) and [Streaming](#).

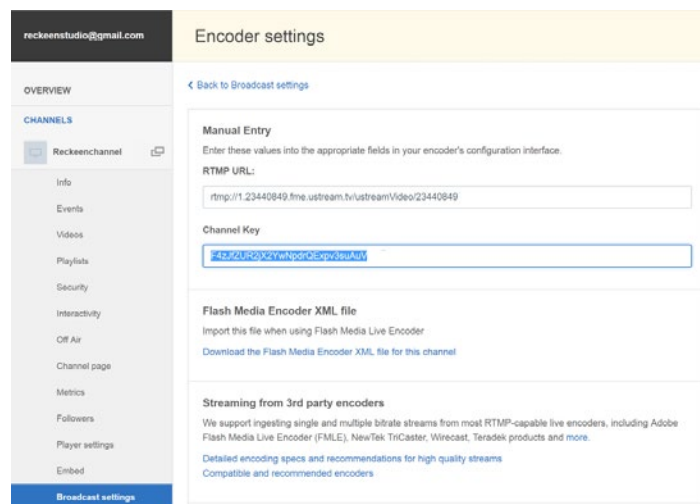
Select Ustream platform from the drop-down menu and click on the [Open the website](#) icon beside it. Picture below.



Log into the account you've created earlier, and then select **Channel Settings** from the drop down list. See the picture below.

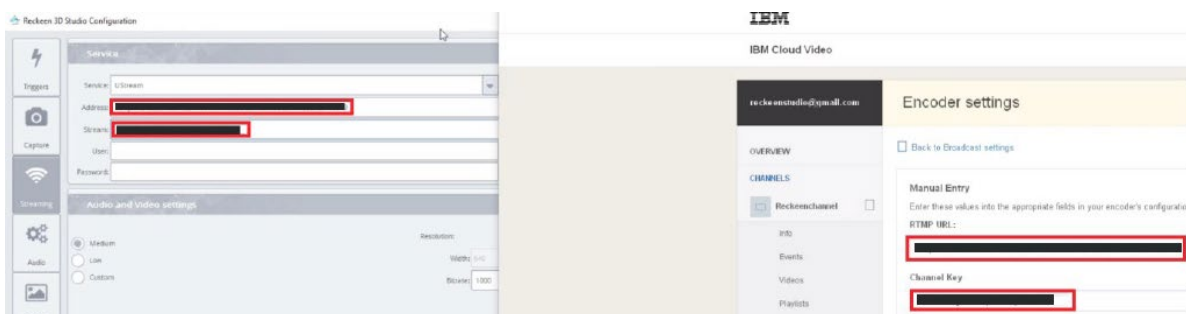


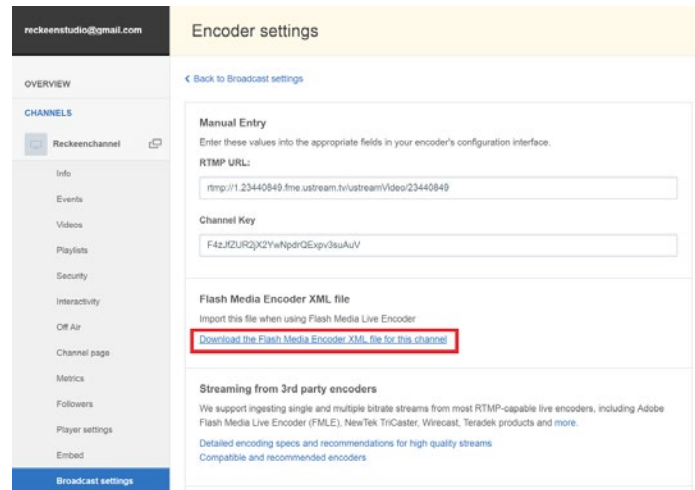
Select the **Broadcast Settings** tab from the drop-down list. Then click on the **View icon** in the **Encoder settings** section. The picture below.



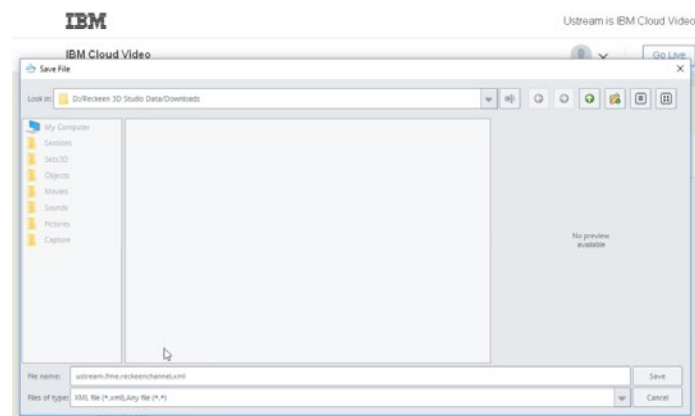
A window: **Encoder settings** is displayed then. There is some data to be copied to your Reckeen3D system in the **Manual Entry** section.

You should copy and paste the **RTMP URL** and **Channel Key** for fields: **Address** and **Stream**.



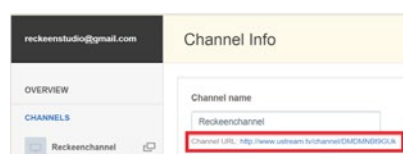


But in Ustream platform you don't have to do this way. Ustream website provides a ready [XML File](#) with the data. To download this file, click on the link in the [Flash Media Encoder XML File](#) section, as shown below. After clicking a link on the page, save the settings file on your hard drive. Choose the location for the file in the [Save file](#) window.



Now, open the [Reckeen3D Configuration](#) window and go to the [Streaming](#) tab. Click on [Import FMLE profile](#) and open the previously saved file from the chosen location. The fields [Address](#) and [Stream](#) in the [Reckeen3D Configuration](#) window will be then filled automatically with the data from the file. Confirm by clicking on the [Ok](#) button.

Now, you can start streaming by clicking on the [Stream](#) icon located on the production screen. When a need arises, you can always load the streaming settings from a file by clicking on the [Import FMLE profile](#). To be able to watch your production live on the Internet, you just have to provide a user with a link [Channel URL](#) . The Link is located in section [Channel info](#) under [Channel name](#) . Picture below.



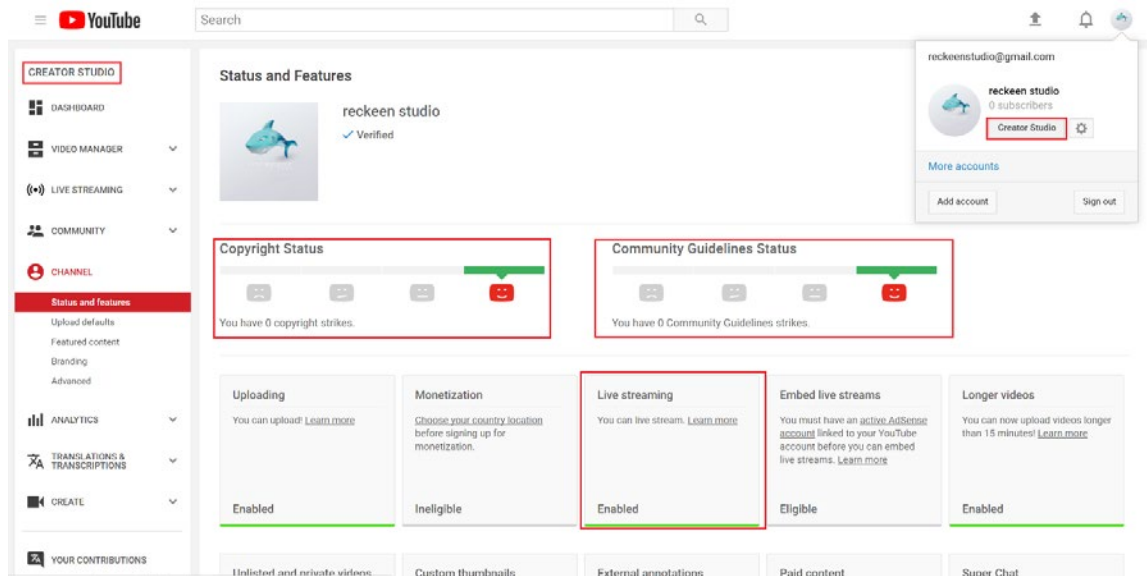
Clicking on this link will open a website address along with a player's window where you can watch this production.



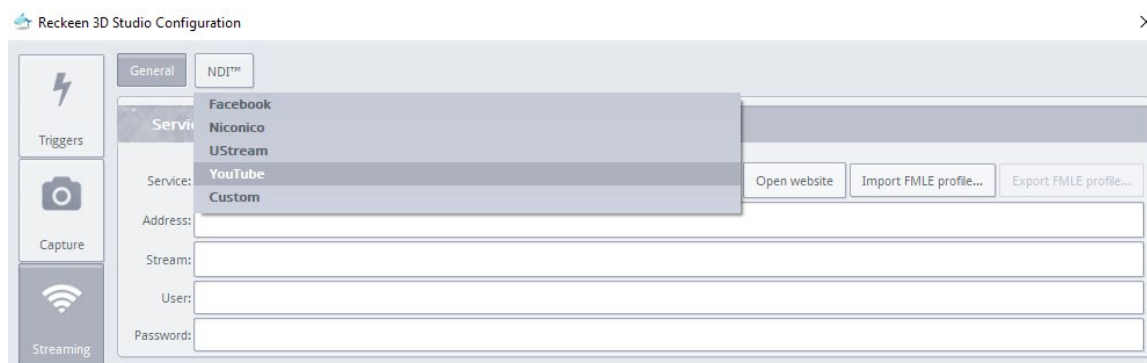
Streaming on YouTube
platform

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To conduct the streaming on the YouTube platform, it is required to create an [account](#) with a [Good standing](#). To check the status of your YouTube account, you have to log on, go to the [Channel](#) tab and choose [Creator Studio](#) icon and then [Status and features](#). Here, you can see that the account has a [Good standing](#) status. As shown below. Scroll the page all the way down and make sure that the option [Live streaming](#) is enabled. The picture below.



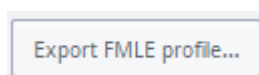
Now go to the Reckeen3D system. Choose the [Streaming](#) tab in the [Reckeen3D Configuration](#) window of the Production screen. Select [YouTube](#) platform from the drop-down list and click on the [Open website](#) icon, as shown below.

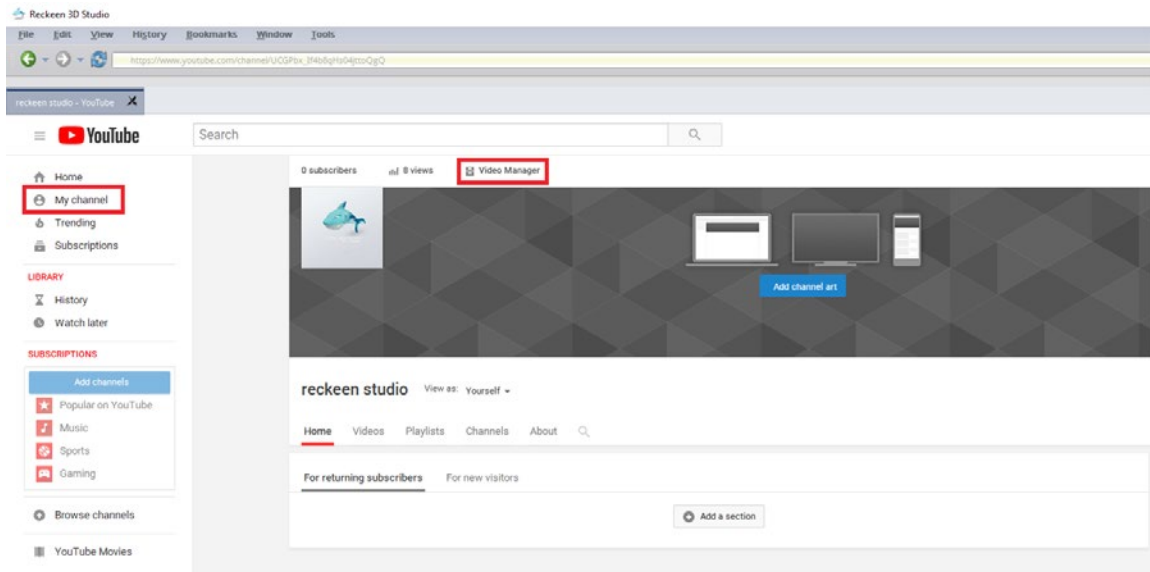


Log into your [YouTube account](#). After opening the [Home](#) tab in the [Reckeen3D window](#), click on the [My Channel](#) tab and then on the [Video Manager](#) icon.

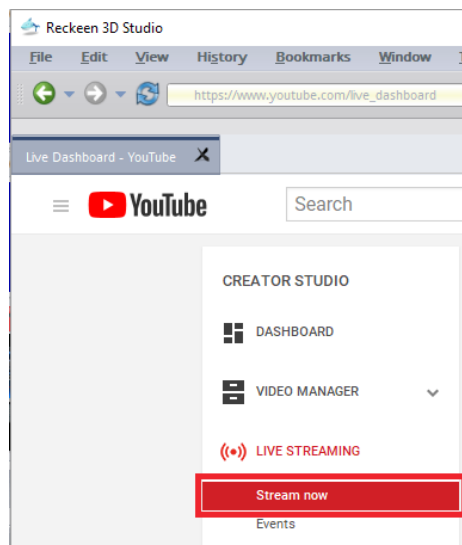
Export FMLE file

RTMP URL address and Channel Key settings are stored in a session file. Those same settings can be saved as a single Flash Media Encoder XML File. After entering the streaming data, just click EXPORT FMLE button and save the file to the disk with “*.xml” extension.





In the [Video Manager](#), click on the [LIVE STREAMING](#) tab and then choose the [Stream Now](#) option.



After opening [Stream now](#) tab, scroll to the bottom of the page to the [ENCODER SETUP](#) section.

ENCODER SETUP

Server URL

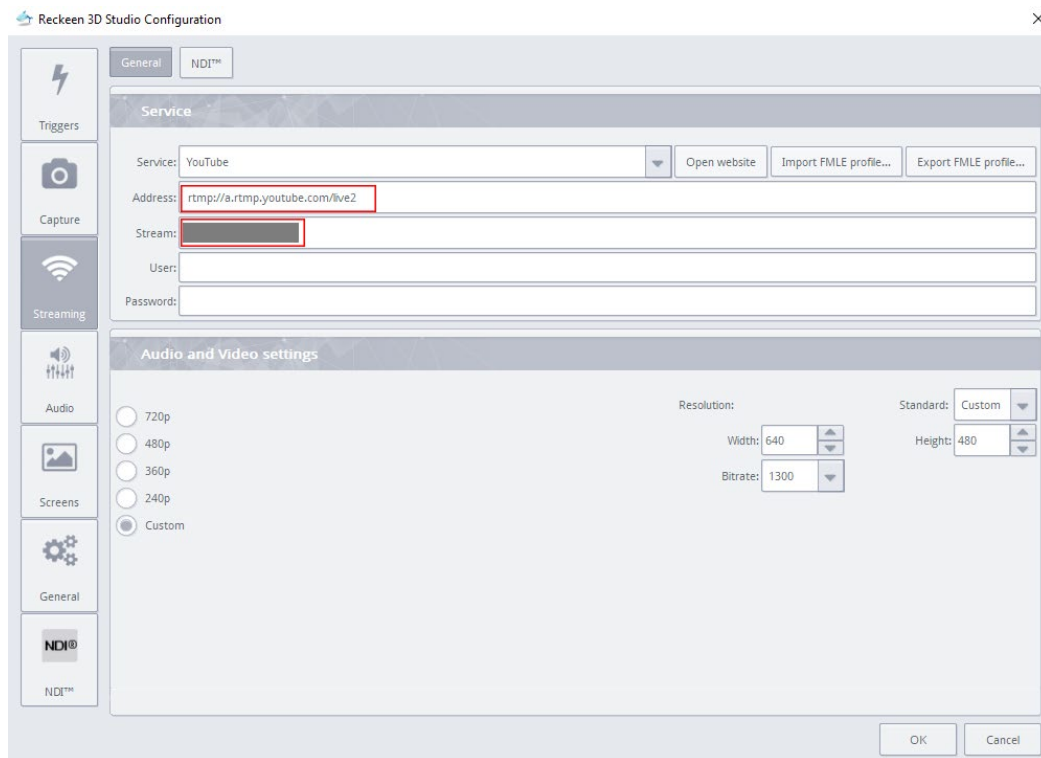
rtmp://a.rtmp.youtube.com/live2

Stream name/key

.....

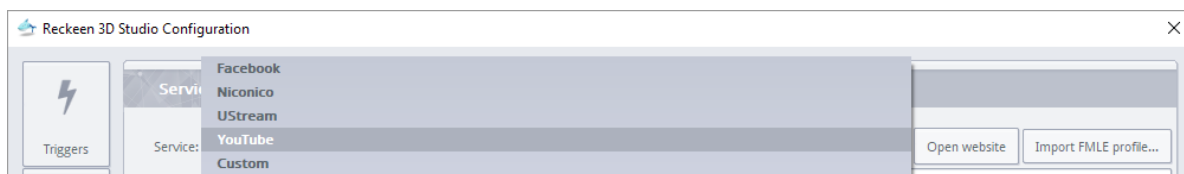
Reveal

Without closing this window, first copy the visible [server's URL](#) and then paste it into the [Address](#) field in the Reckeen3D [Configuration](#) window. Afterwards, press the [Reveal](#) icon, as shown above, and copy the disclosed data to the [Stream](#) field. The picture below



After pasting the data into the fields of [Address](#) and [Stream](#), click the [OK](#) button. Now, you can begin streaming on your [YouTube](#) channel. Filling the fields [User](#) and [Password](#) is not mandatory. You just need to pre-set the parameters of [Audio and Video Settings](#) in order to adjust the quality of the broadcast image to the capabilities of your internet connection. You can now save an entire session with the data into an appropriately named file ([File> Save Session As ...](#)). You will be able to load it from the file any time you want to start streaming on the [YouTube](#) platform.

The [Reckeen3D system](#) has [UStream](#), [YouTube](#) and [Niconico](#) platforms listed, along with a [Custom](#) version to choose from. The next picture.



When you select the [Custom](#) version, you can enter any parameters of the streaming service supporting [RTMP](#). Now, all you need to do is to inform your viewers about the name of your channel (you can also send the link from the platform) and time of your broadcast. Now, you can go on the air with your own [live show](#)!



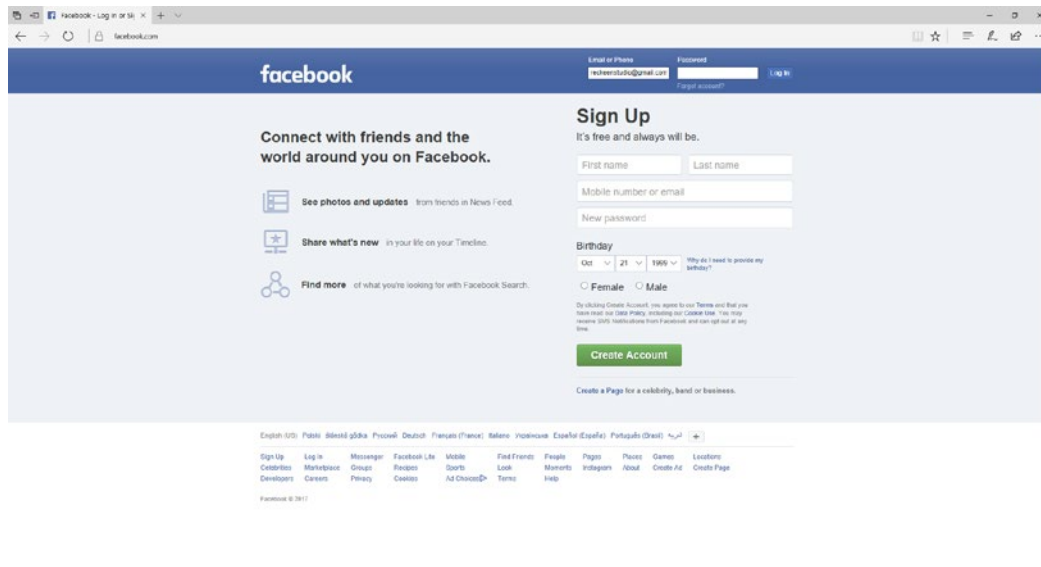
Streaming on Facebook

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It suffice that such a service supports [RTMP](#) protocol. Those are ; Ustream.tv, Youtube.com or Facebook.

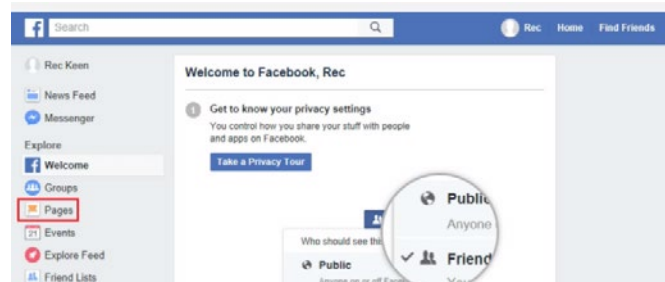
Log into your account. You have two options. The first one is to stream on Facebook via your [user account](#), that is using a regular post. A video window will appear in it, just as usual, when users exchange information or videos. The second option is to create your own [Facebook page](#) with its unique name.

If you choose the [first option](#), you need only to have a Facebook user account.

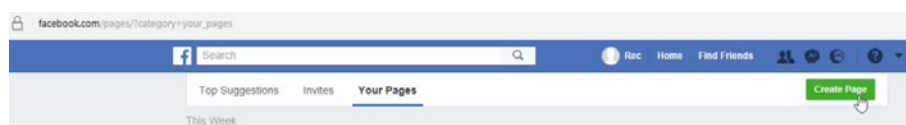


In the case of the [second option](#), you have to log into your user account and create a page.

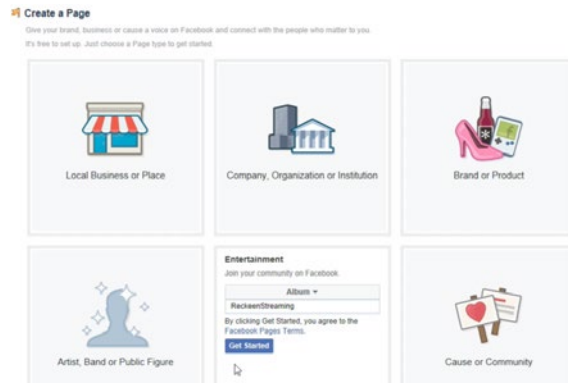
Select [Pages](#) tab from the management tabs on the left side of the screen.



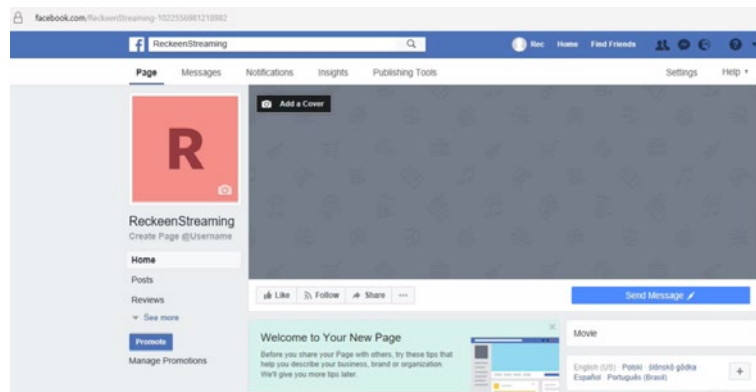
Click [Create Pages](#) button to create a page.



Choose a category and enter the page's name. The page is created after you press [Get Started](#) button.

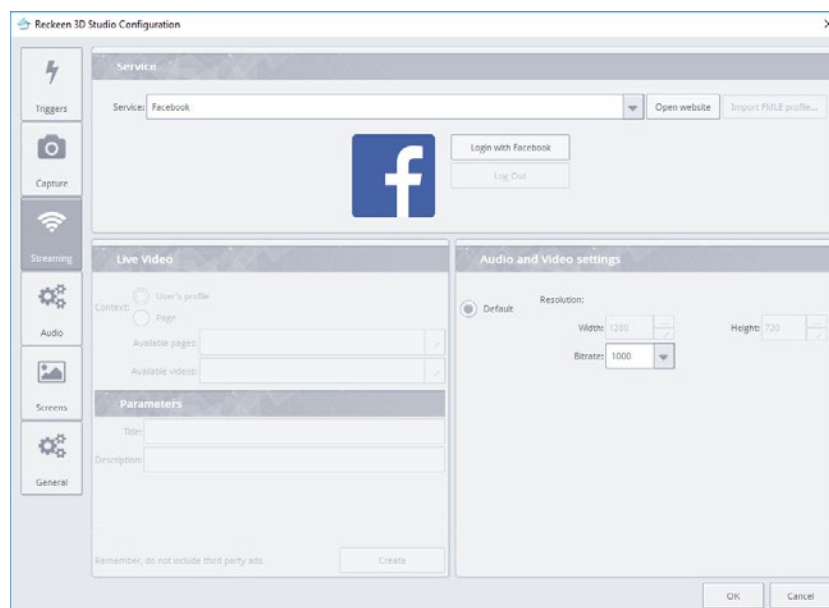


You have created a site. Now you start to stream on Facebook.

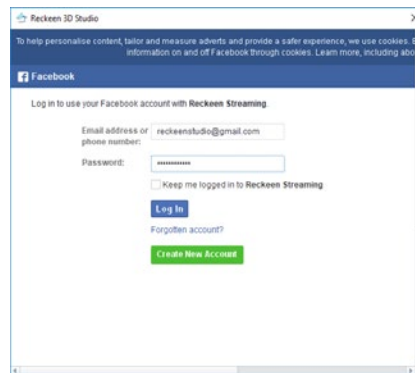


First, launch the [Production module](#) in the Reckeen system - [3D Production](#) or [LITE Production](#).

Press streaming [Configuration](#) button. From the available services, choose Facebook.



Then, log into your user account. Enter your e-mail address and password.

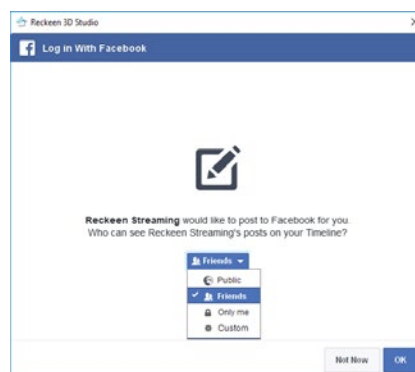


In order to be able to stream on Facebook, you have to accept the terms and conditions. The first one states that Facebook will get your profile information, such as name, photo, age, gender, language, country and such. Press [Continue](#) button.

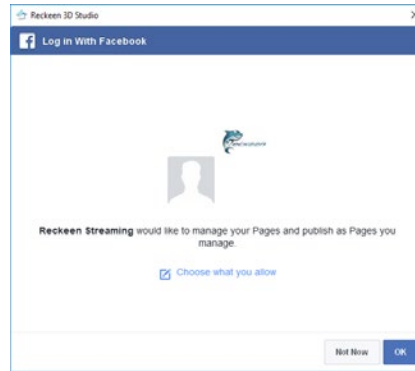


The streaming content will be shown on the user's account.

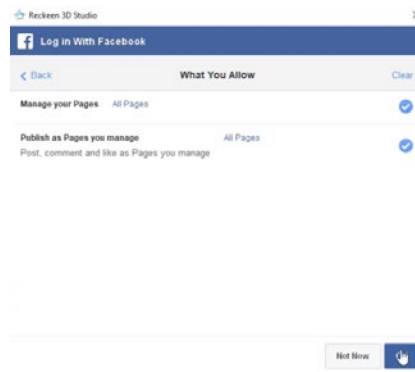
Facebook now asks you, to whom this streaming should be visible to - whether it's a public video show, a friend's show or just for the account's owner.



If you created a page, the Facebook will ask you about a possibility of adding streaming there, so that other users could view the video and have a chance to like it or comment on it.

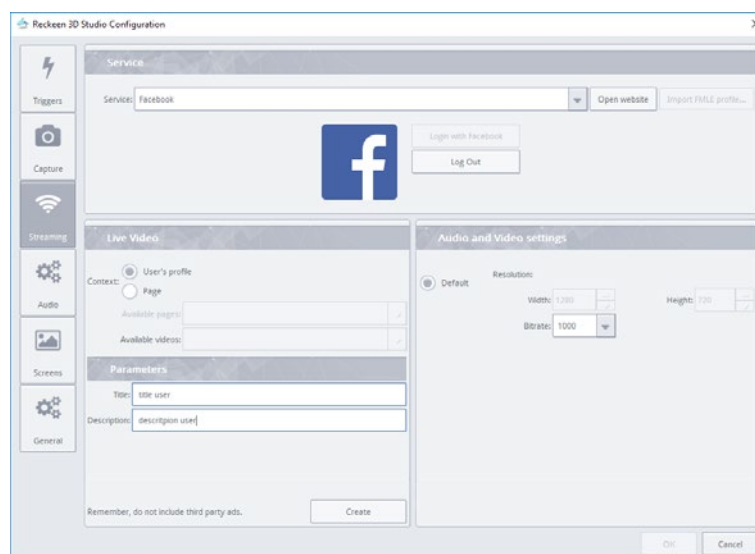


Choose what you allow.

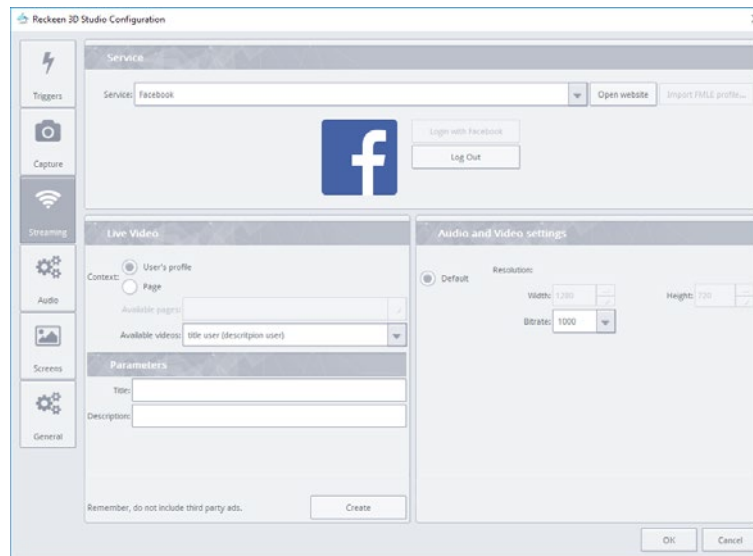


Accept the terms and conditions. You are now logged in.

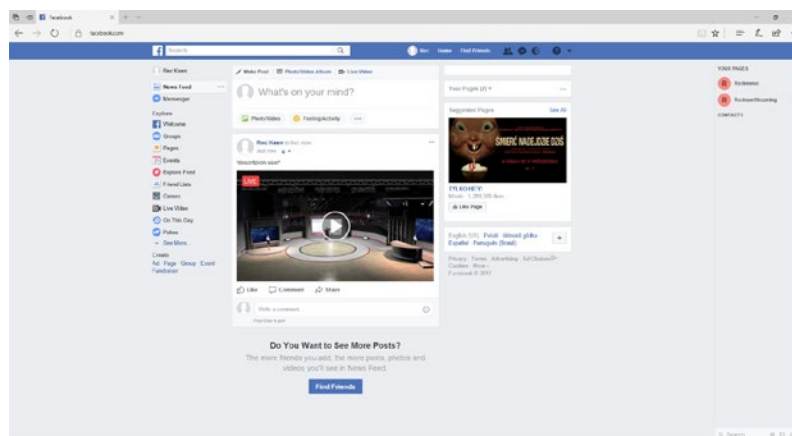
As mentioned earlier, there are two streaming options. Streaming to a user account - so you choose a user account. If you have video channels created, choose one of them. If not, you can create a new channel. In the [Parameters](#) window, type in a title and a brief description. If everything is filled in correctly, press [Create](#) button.



You can see the added video stream on [Available Videos](#) drop-down list. Click on it and click [OK](#).

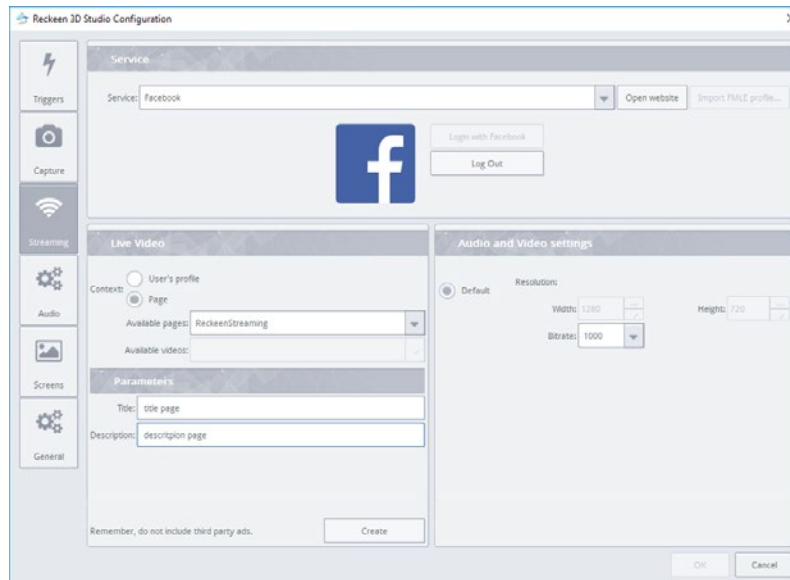


The settings are ready. Now, all you need is [Stream](#) button on the [Production](#) screen, to send the video to your Facebook channel. You've started streaming the video. Other users can view the image from your [Program](#) output in your post.



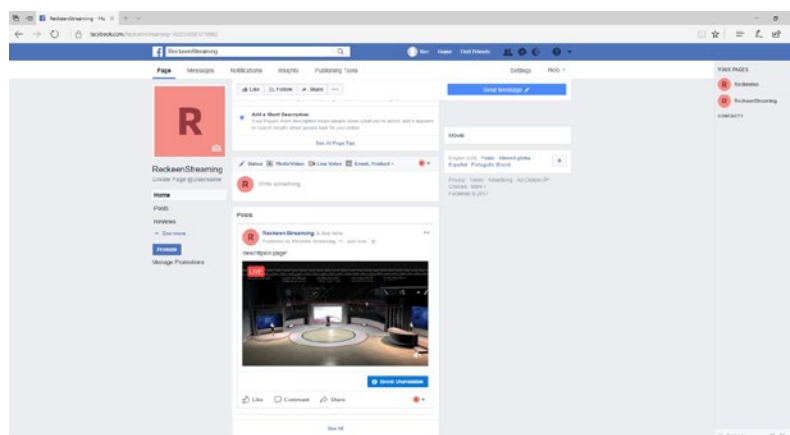
Press [Stream](#) button once again to stop streaming. After pressing this button the second time, it is not possible to continue with the last video. You have to choose another one or create a new one.

Now, the second option - streaming to your Facebook page. Select [Page](#) in the [Live Video> Context](#) area. Choose available pages from the drop-down list. Write a title and a brief description. Press [Create](#) button.



You can see the name of the created page and the available video. After pressing **OK** button, you can stream, this time to your own page, where a new post with the streamed video will be created.

Press **Stream** button once again to stop streaming.



21

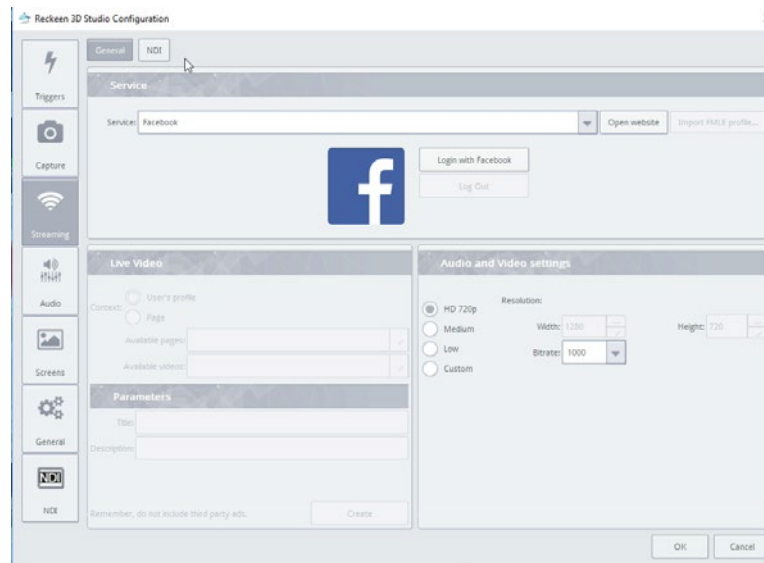


NDI Standard

NDI, that is Network Device Interface. It is a standard that enables network communication by sending and receiving high quality and low-delay audio and video signal. NewTek's innovative Network Device Interface technology, is a royalty free standard enabling IP video workflows across Ethernet networks and represents the most prolific IP-based workflow in the industry. NDI is a trademark of NewTek, Inc.

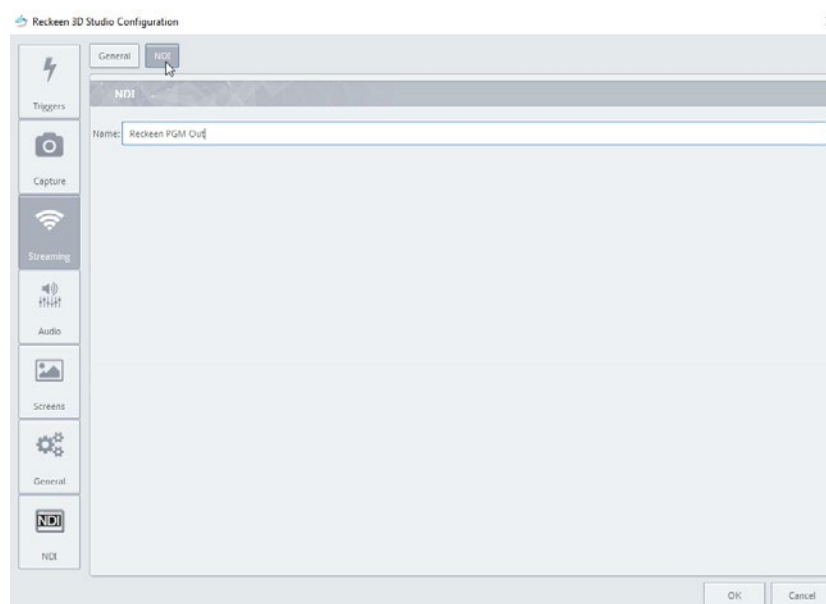
Such a foundation makes reliable operation in a live production environment possible. The Reckeen system allows you to broadcast a stream from PROGRAM channel to the network. To do this, we have to go to the settings pressing a 'gear' button located next to STREAM button.

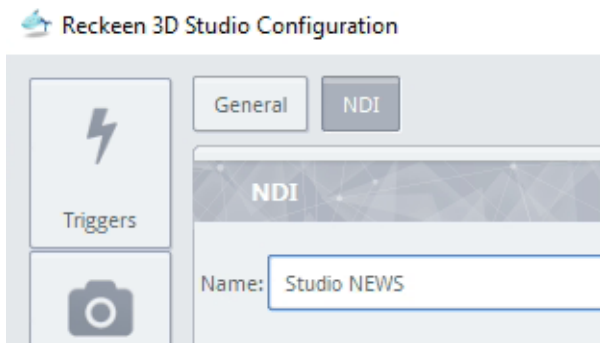
In the GENERAL tab, we can set parameters for streaming to a server supporting RMTP protocol, for example to the Facebook. Picture below.



This makes it possible to watch PROGRAM output all over the world via a browser.

When we press NDI tab, we will be able to broadcast a video signal, but this time across LAN. Picture below.



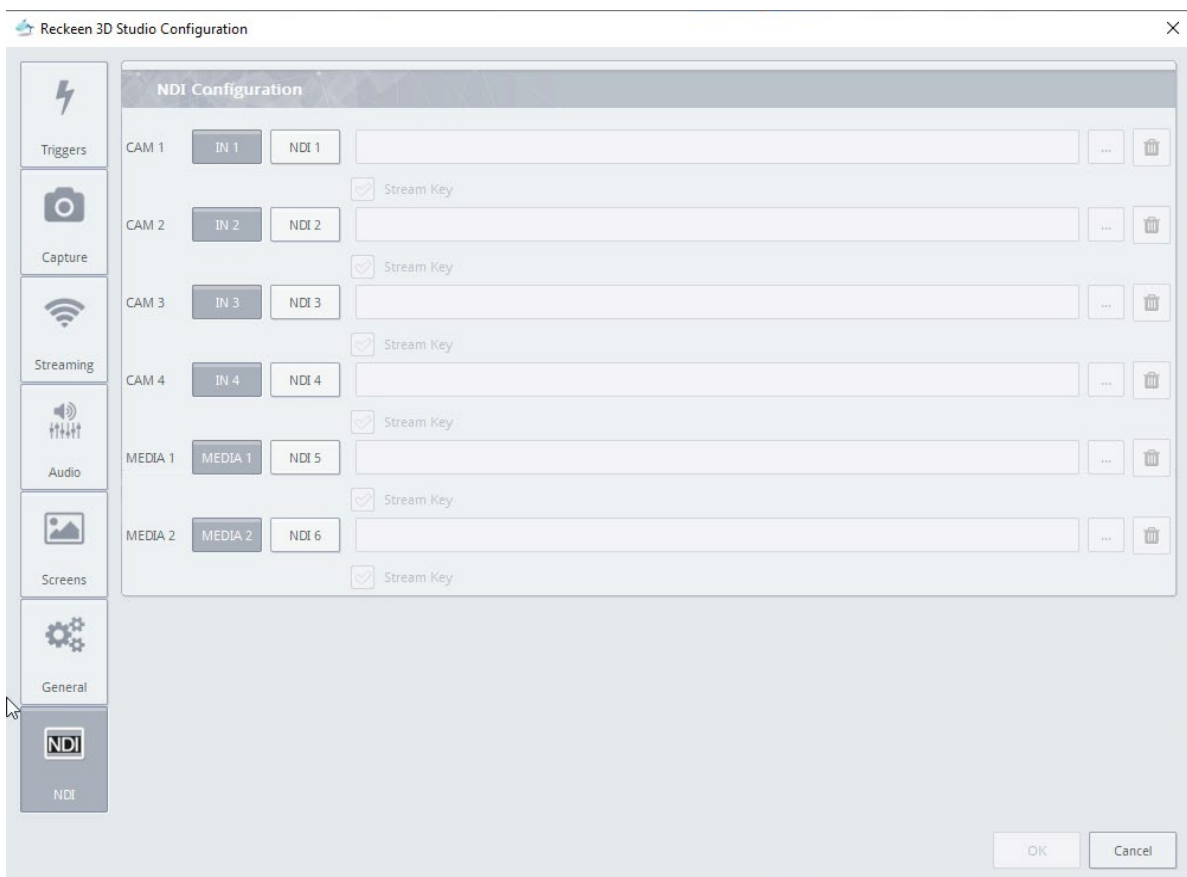


It connects computers in a specific area, for example a school or an office, that is computers connected within a local structure. We enter the stream's unique name, STUDIO NEWS for example, in a box at left.

We press OK to accept. In the moment we press STREAM button, a transmission of audio and VIDEO streams will begin. We stop streaming by pressing the button again.

In the situation when we stop sending the NDI signal and change the name of the stream, after the transmission resumes, the application will not refresh this stream. The receiver have to refresh search and connect ones again to the transmitter with new name.

Now, we will show you on an example how to receive a particular NDI signal. We go to menu OPTIONS and CONFIGURATION. In the last position, we can see NDI tab. Picture below.



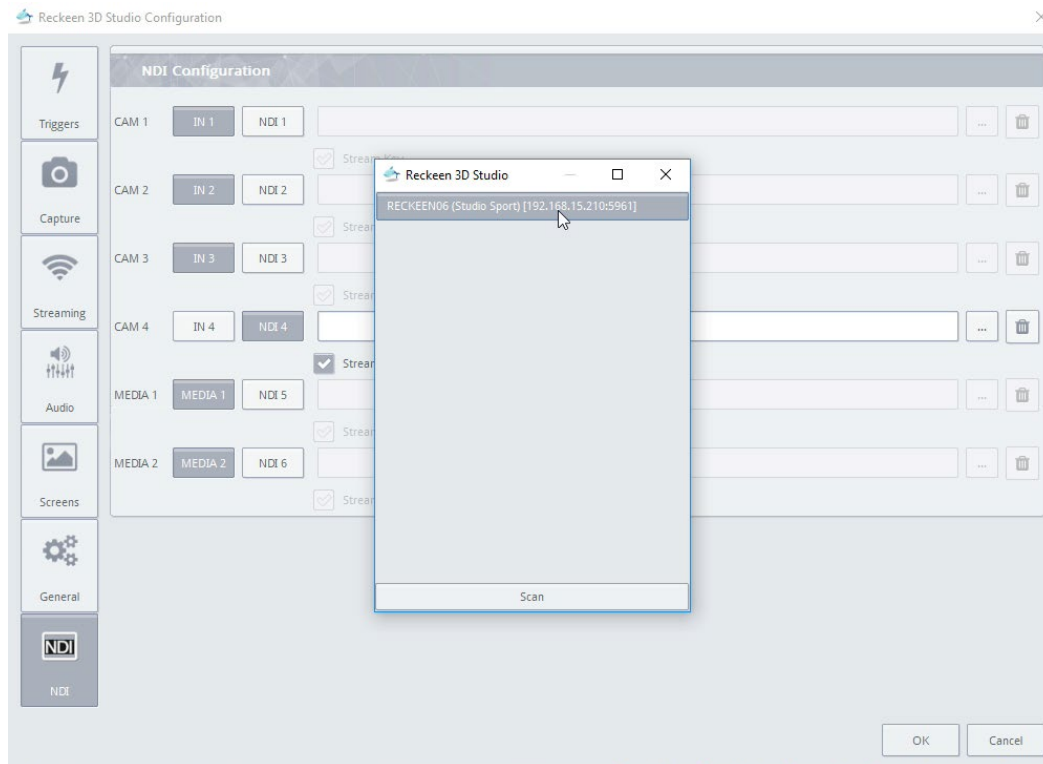
Due to the system's specific nature of operation and capacity, we suggest using a maximum of two FULL HD streams, i.e. 1080p60.

If we want to use also other inputs as NDI, we should broadcast a stream with a reduced resolution, 720p for example. To receive the NDI stream, we have to select one of the inputs.

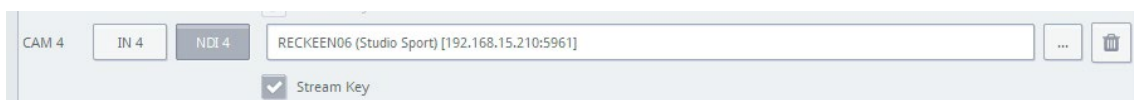
In the Reckeen system, it is possible to replace the physical input of the camera or video stream from the tray with the NDI signal.

We will choose CAMERA 4 input and press NDI button. On the right, a button with three dots appears.

After pressing it, a window shows up in which we can choose NDI stream. Picture below.



On the list we can find a description that contains a computer's name and further in brackets, a name entered in the STREAMING window and a computer's IP address. Below, we can see a STREAM KEY selection function.



If we leave this option checked, it will not be possible to set a keying algorithm when we go to KEY 4 tab. NDI graphics will then appear. This means a key's mask is provided by the NDI stream. Picture below.

We will go back to the NDI settings in the CONFIGURATION window. We uncheck STREAM KEY option for the given input. Now the input can be subjected to a keying procedure in the RECKEEN system.



We can use in the same way chroma or luma key algorithm as if it was an input connected to the Reckeen Card via HDMI or SDI.

To distinguish whether a given input originates from the Reckeen Card or from the NDI stream, there is an 'NDI' caption on the input bar. Next to the caption, the input's video format appears.

NDI input supports two channels, left and right . In the mixer's AUDIO INPUT tab, all functions, such as MUTE, SOLO or volume level slider, work in the same way as in the case of a physical HDMI or SDI input.

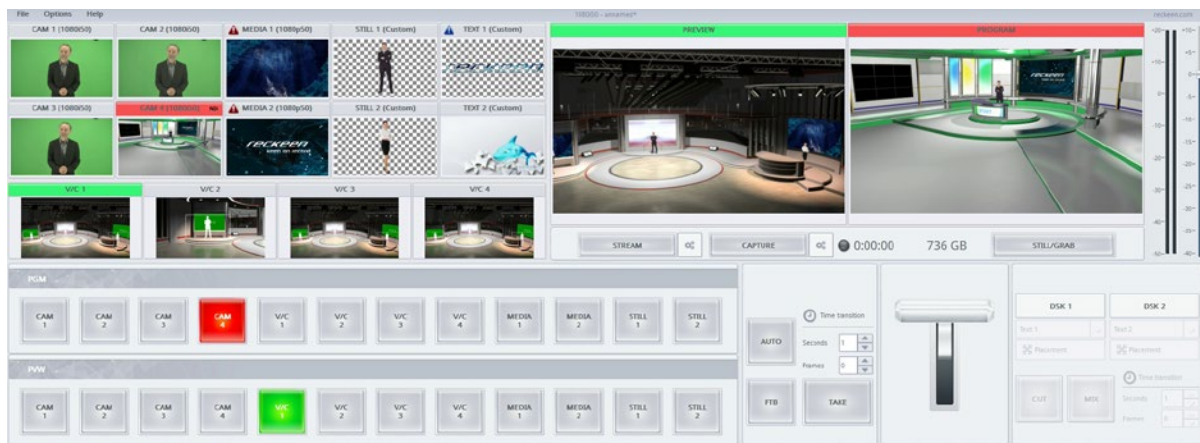


The sound level in the case of NDI input is treated in the same way as in the case of MEDIA. The 0dB level on the indicator means the maximum value of the sound level to be accepted. Above this value, the signal is distorted. Therefore, when we broadcast an NDI stream from the Reckeen system, this value can not be exceeded.

We can send any content between two RECKEEN systems. Using PGM buttons of the main mixer, a user on the second computer can send: A full-screen view from a camera connected to the system, any video file, graphic file, as well as studio's view.

With VC 1 to VC 4 buttons, we will control a view of our studio loaded into the system, setting the appropriate camera shots, whereas a signal from another machine containing a view of another studio will be sent to CAM 4 button with the use of NDI.

This provides an opportunity to build a structure of a large-format TV station. Picture below.





22

Control Panel VKEY 100 /
external keyboard

You can control the Reckeen 3D system with the **VKey-100** control panel, **or/and** with a standard **PC keyboard**.

HOW TO CONNECT KEYBOARD VKEY-100 TO THE RECKEEN SYSTEM

The full set of configurations includes:

- Vkey100 Keyboard
- RS 232 communication cable with DB9 connector.
- Power supply unit and adapterst

Connect the keyboard to the system using RS 232 communication cable with DB9 connector. Plug the end of the cable to the input / output card. Connect the other end of the cable to the keyboard's port. Screw in the locking screws. Picture below.



Use a proper power supply adapter used in different types of electrical networks. Select the appropriate adapter and insert it into the power plug. Move it forward until you hear a click. Picture below.



First connect the power supply plug to the VKey 100 keyboard power socket and bolt the locking screw. Picture below.



Next connect the power supply unit to the electrical outlet. Picture below



Now you can safely set the Reckeen system switch to position 1 and then turn on the power using the VKey 100 switch.



TEST AND CALIBRATION OF THE V-KEY 100 KEYBOARD

In the first step turning the keyboard on by switching the power button to position 1. The appropriate buttons will light up for a moment.

In order to perform the keys' illumination test, a proper sequence has to be performed. The following buttons have to be pressed simultaneously: DELEGATION A, DELEGATION DSK 1 and LOCK like the picture below.



After this pressing, the LOCK and DELEGATION DSK 1 buttons are blinking. It is possible to check the backlight of all buttons. Let's press the keyboard keys one by one, in any order. The first time you press a key, it lights up in white. A second press makes the key light up in its function color: Red, green or orange - depending on its application. Picture below.



You can exit the test mode by pressing LOCK key. The keyboard will return to its normal operation mode.

CALIBRATION OF JOYSTICK AND T-BAR

Simultaneously press the following buttons: DELEGATION A , DELEGATION DSK 2 and and LOCK like the picture below.



5 buttons will light up signaling execution of a test for example, communication F1. Picture below.



The second test is JOYSTICK's calibration. Move it to the right and to the left to its extreme positions. When it's completed, the F2 LED will light up in white. Picture below.



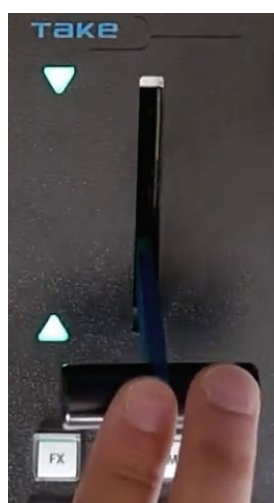
Now let's move the joystick up and down to its extreme positions. When you complete that, the F3 LED will light up in white. Picture below.



F4 is the JOYSTICK's knob calibration. We turn it several times to the right and to the left to the extreme positions. When you complete that, the F4 LED will light up in white. Picture below.



F5 test is the T-BAR's calibration. Move the T-BAR to its extreme positions. Picture below.



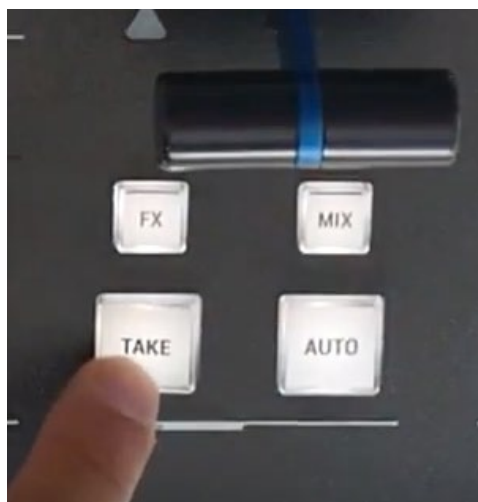
After several movements, all the LEDs will go out. This way, the keyboard has been calibrated and has returned to its normal operation mode.

TEST OF ADJUSTING THE BRIGHTNESS OF THE KEYBOARD'S BACKLIGHT

Simultaneously press the following buttons: DELEGATION A, DELEGATION B and LOCK like picture bellow.



The keyboard shows the current brightness of the keys. Pressing TAKE key several times decreases the backlight's brightness. AUTO key increases brightness of the keys. Picture below



When an appropriate value is set, exit the mode by pressing LOCK key. The keyboard returns to its normal operation mode.

ADJUSTING THE RESISTANCE OF T-BAR'S MOVEMENT



On the right side of the panel a hidden inspection space is provided for that purpose. In order to remove the panel, we will use a hex screwdriver with an appropriate blade length - 11 cm. Use anti-clockwise motion and remove two screws that secure the panel. Picture below.



Hold down the panel and secure the fastening screws. Remove the panel from the keyboard housing. The right hole is used for inspecting interior of the housing. The left hole is used for adjusting the T-BAR with a screwdriver. Picture below.



Set the T-BAR in the middle position. An adjustment screw will appear in the hole. Picture below.

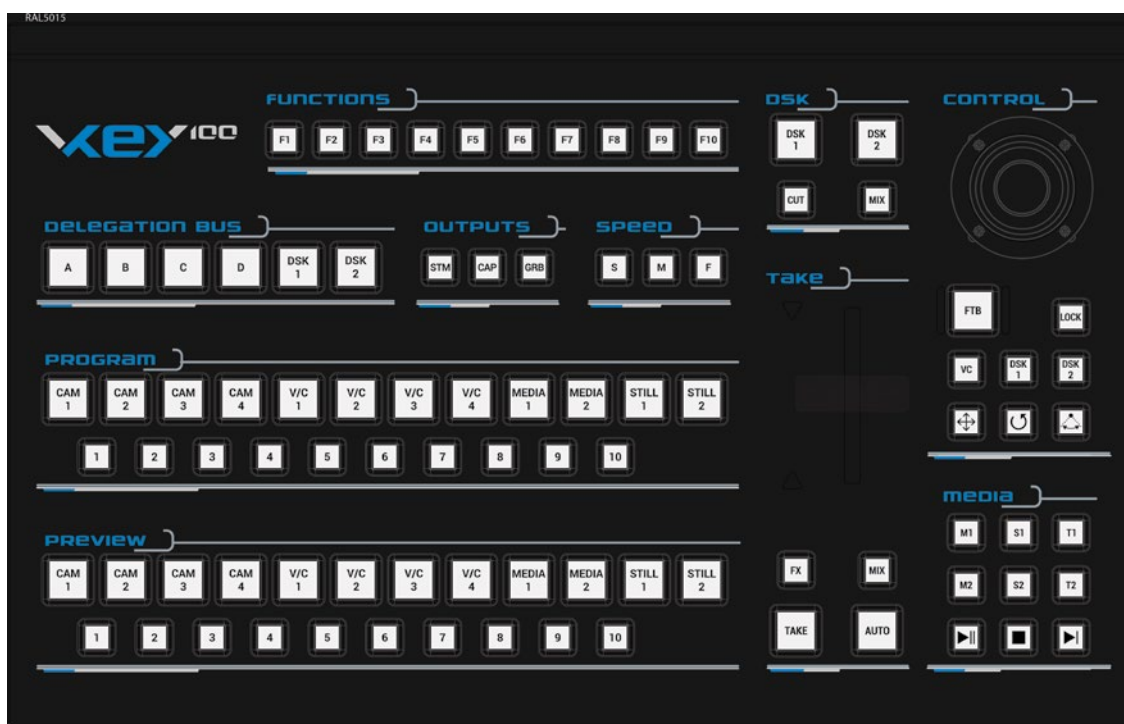


Insert the screwdriver into the hole placing it on the screw head. Clockwise motion increases the resistance of T-BAR's movement, while anti-clockwise decreases it. Picture below.

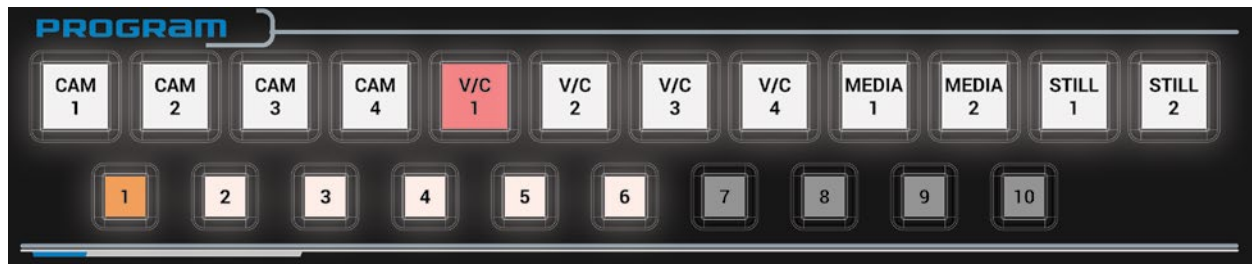


HOW TO USE V-KEY100 KEYBOARD

V-KEY100 Keyboard. Picture below:



In the central part you can find a main mixer. The first row of buttons, backlit in red, stands for PROGRAM channel, live on the air

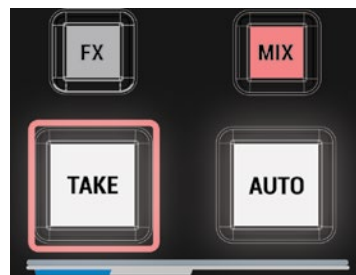


The second row of buttons is the PREVIEW channel, where you prepare the material. It is backlit in green.

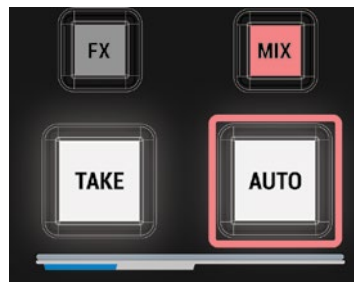


State of the keyboard keys reflects the state of the Reckeen application.

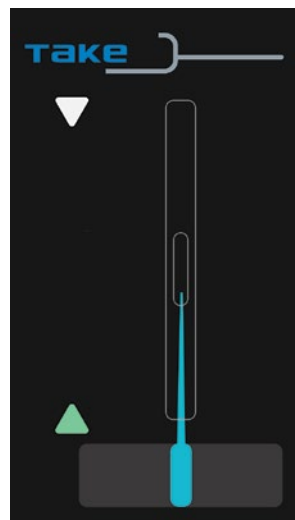
A transition between video channels can be performed with TAKE function. This is an immediate transition. In this case, the selected items on the Program and Preview mixers switch their places.



The second method is a transition with the use of AUTO. It is a smooth transition with a time set in the application. After its use, the T-BAR's motion is reflected in the application. And a smooth change between PROGRAM and PREVIEW channels takes place.



The third option is to use the T-BAR manually. A lit up green arrow indicates that the T-BAR is in its extreme position. After moving to the next extreme position, another arrow will light up. The PREVIEW channel will smoothly transition to the PROGRAM channel.



You can control the camera shots using the VC buttons. It is possible to highlight shots in the application after selecting an appropriate video channel. Press a button, for example PROGRAM channel's VC 1.



In the application, VC 1 tab will be highlighted in red.

PROGRAM channel shots will appear next to it. There are 15 possible shots in a given VC, first 10 of which can be found on the keyboard.



In the default NEWS studio, 6 shots have been programmed, so the same number of buttons is currently backlit on the keyboard in the PROGRAM shots section. After pressing one of the buttons, a virtual camera makes a transition to a given shot in accordance with an application mode set, e.g. linear or curved at the speed of 5. A smooth transition to the next point is made. After this movement, the button lights up permanently in orange.

The same can be done in the PREVIEW channel. Let's press one of the VC buttons.



In the application, the tab will change its color to green.

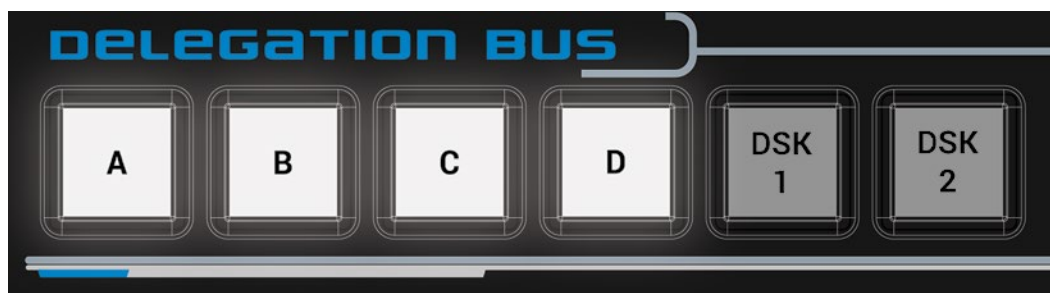


In the window, you can see PREVIEW channel shots. Press one of the buttons to change the shot. The camera moves, this time in the PREVIEW channel. After this movement, the button lights up permanently in orange.

You can also configure the sources in the studio. In the application, the ABCD mixer is used for that purpose.



On the keyboard, the DELAGATION BUS keys will be used.



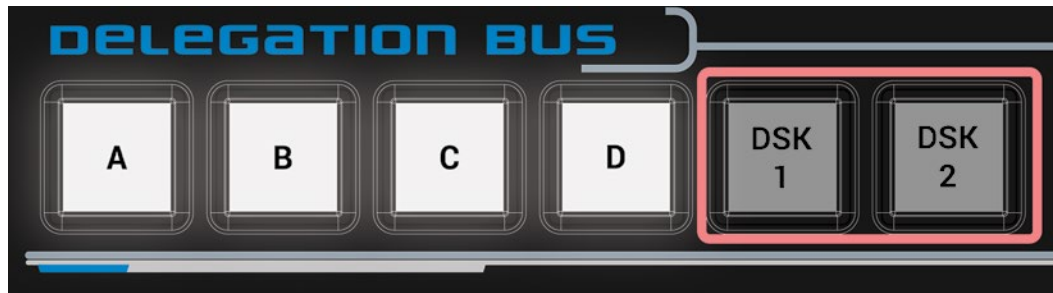
Hold down one of the layer buttons, A for example. Buttons enabling source selection for layer A will be illuminated in the PREVIEW channel.



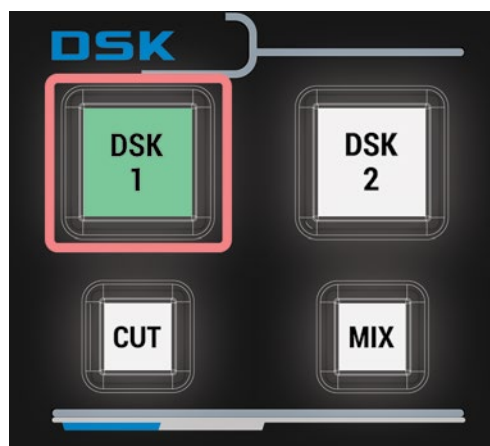
In addition, you can use the buttons on the media mixer.



When you select one of the buttons, the illumination of this layer's button changes in the application. Right next to ABCD layer buttons, you can find buttons for setting sources for DSK layers.

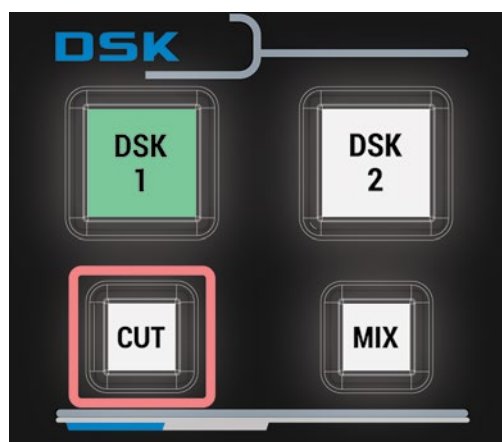


They are inactive, so first you have to enable one of the layers. Let's press a button, e.g. DSK 1.

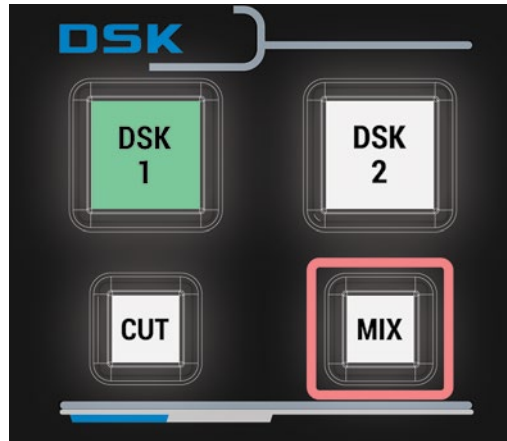


It will be backlit in green, which means - visible in the PREVIEW channel. Now the DELEGATION BUS button is active. Hold down one of the Delegation BUS buttons, e.g. DSK 1. This time you choose a source for DSK 1 in the PREVIEW channel. You can also use the media mixer. Pressing the button brings the keyboard to its normal operation mode.

Operating the DSK with the keyboard is analogous to the one using the application. It is possible to redirect a DSK source from PREVIEW to PROGRAM channel using CUT button.

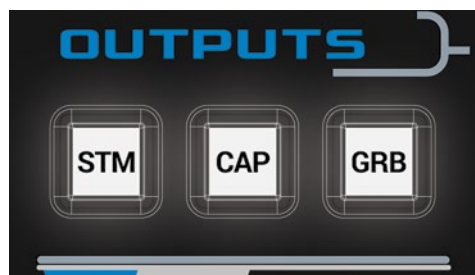


After pressing it, the source will immediately appear on the air. DSK 1 button lights up in red. DELEGATION DSK buttons are turned off. Another way to introduce a DSK source on the air is to use MIX button.



When a proper time is set in the application, the source will appear in a smooth transition from the PREVIEW to the PROGRAM channel.

There are three OUTPUT buttons next to DELEGATION buttons.



The first one - CAPTURE - allows you to record the PROGRAM channel to a video file on the disc. When pressed, it will light up in red. The recording starts and a corresponding button with a timer becomes highlighted in the application. The recording is stopped by pressing CAPTURE button again. The button is backlit in white until its next use. Similarly, you can use STM button to stream to a server. Next to it, you can see GRB button for creating a graphic image of the program output.

There are 10 function keys in the upper part of the keyboard. If they are not backlit in white, it means that none of these buttons have been programmed.

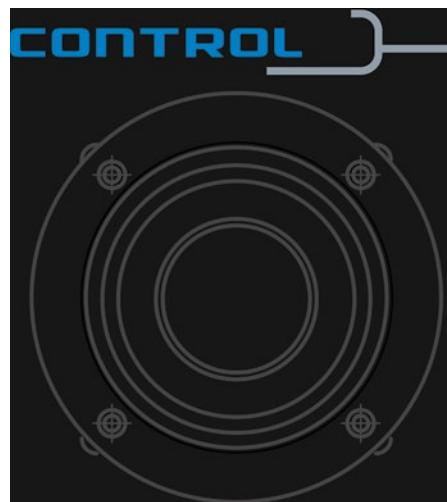


You can program them by going to MENU OPTIONS and CONFIGURATION. In the TRIGGER tab, you can assign them suitable functions, e.g. GRAPHICS OVERLAY. After programming two buttons, F1 and F3 for example, and exiting the configuration window, these programmed function keys will be backlit on the VKEY 100 keyboard.



You can use only one function key at a time. After pressing F1 key, it lights up in red as active. All the others are disabled. The function's deactivation occurs after pressing this button again. After switching it off, the programmed keys will light up in white.

It is possible to control a virtual camera with a JOYSTICK, both in the preview channel and on the air.



On the PROGRAM mixer, select a button, VC 1 for example.

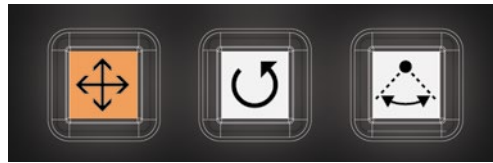


The corresponding tab will be highlighted in red in the application. This way, you choose virtual camera control with a JOYSTICK's use in the PROGRAM channel. In the Joystick control section, select VC mode, that is a virtual cameraman.



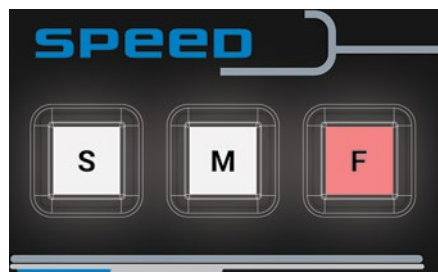
There are three options below.

- The first one is MOVE. When you select this button, it lights up in orange.



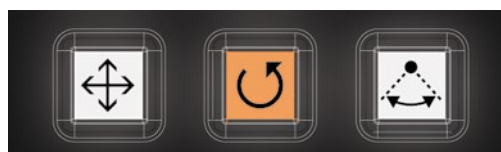
With the JOYSTICK you can move the camera forwards, backwards, to the right and to the left.

The three F M S buttons are used to set three JOYSTICK speeds. After selecting, for example, F button (FAST), you get much faster camera movement with JOYSTICK's deflection from zero to its maximum than when choosing M option (MEDIUM) or S one (SLOW).



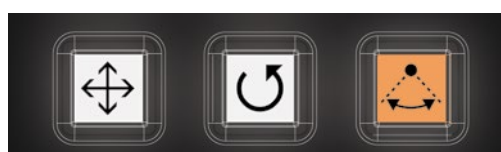
The speed mode also applies to the JOYSTICK's knob. With its rotation to the right you can raise the camera and lower the camera by turning it to the left.

- ROTATION is the second option for moving the camera.



You can rotate the camera around its own axis (right, left, up and down) with a JOYSTICK. Using the knob in this mode, you move the camera forwards by turning the knob to the right and backwards by turning it to the left.

- The third movement option is ORBIT.



In this mode, you move the camera around a specific point in the studio with a fixed distance from it. By

default, this is the 0.0 point. The point of orbit center can be changed in the CAMERA SETUP. Select and highlight any of the objects. After leaving the editor, the new center point of the orbit will be remembered.

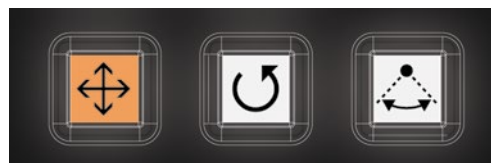


When you select DSK option, you can set this layer's contents with a JOYSTICK. If the DSK button is backlit in green, then the button is active and can be selected.



There are two options at your disposal.

- The first - positioning of DSK source.

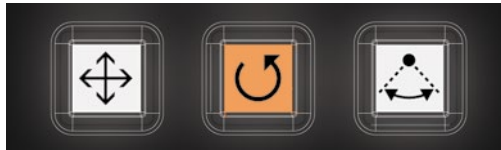


With a JOYSTICK you can, for example, insert a picture (e.g. a station logo) anywhere in the PREVIEW. Use the knob to scale it. You reduce its size by turning the knob to the right and enlarge it by turning to the left.



If the DSK layer is transferred to the PROGRAM channel, that is on the air, then making adjustments with a JOYSTICK is no longer possible.

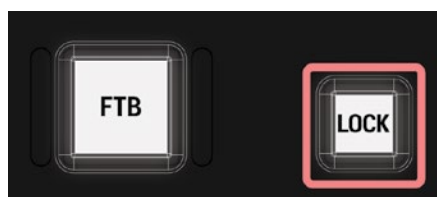
- There is also a second option to use a JOYSTICK for DSK. Choose DSK and ROTATION option.



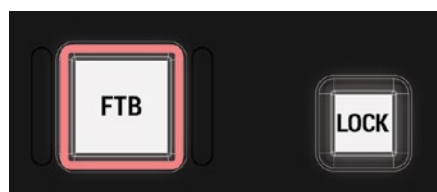
Using the knob, you can rotate the DSK layer's content to the right or to the left respectively.



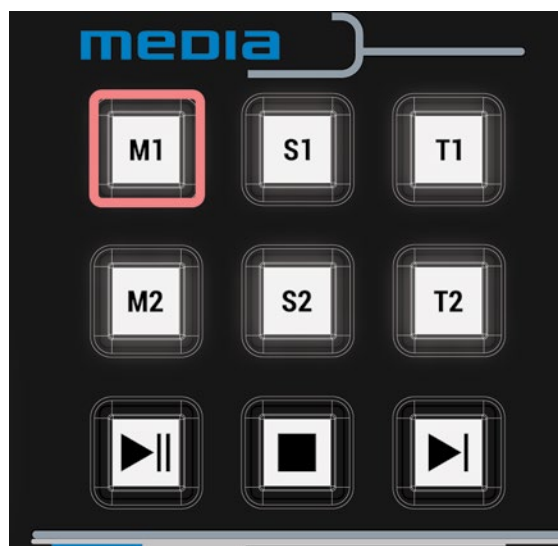
You can find a LOCK button next to the Joystick. It allows you to completely lock the JOYSTICK. When it lights up in red, the JOYSTICK is protected against accidental use.



In emergency situations, it is possible to press the FTB button which will then light up in red. A black board will appear on the PROGRAM screen and the sound on the mixer will be muted. Pressing this button again restores the previous view and the sound mixer's state.



With the keyboard, you also have control over video and image trays. With a single button, e.g. M1, you can select MEDIA 1 video tray.



It will open automatically in the file preview application. The selected file can be stopped by pressing STOP button.



Play it again with PLAY button. When it is playing, you can PAUSE it with a button.



Press NEXT button to select the next file from the tray.



It will be highlighted in the window as ready to use. You open a new file by pressing PLAY button. In the same way, you can view STILL and TEXT image files or play a playlist sequence.

PROGRAMMING TRIGGER BUTTONS

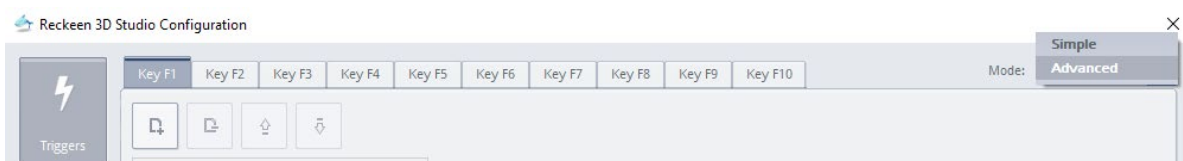
Simple mode has been created for the on **PRG** screen viewing of movies, full-screen images, or for quick.

There are three OUTPUT buttons next to DELEGATION buttons input of audio files . In **Advanced** mode we can freely combine the functions of the whole application.

You can set the following commands to the **function buttons**:

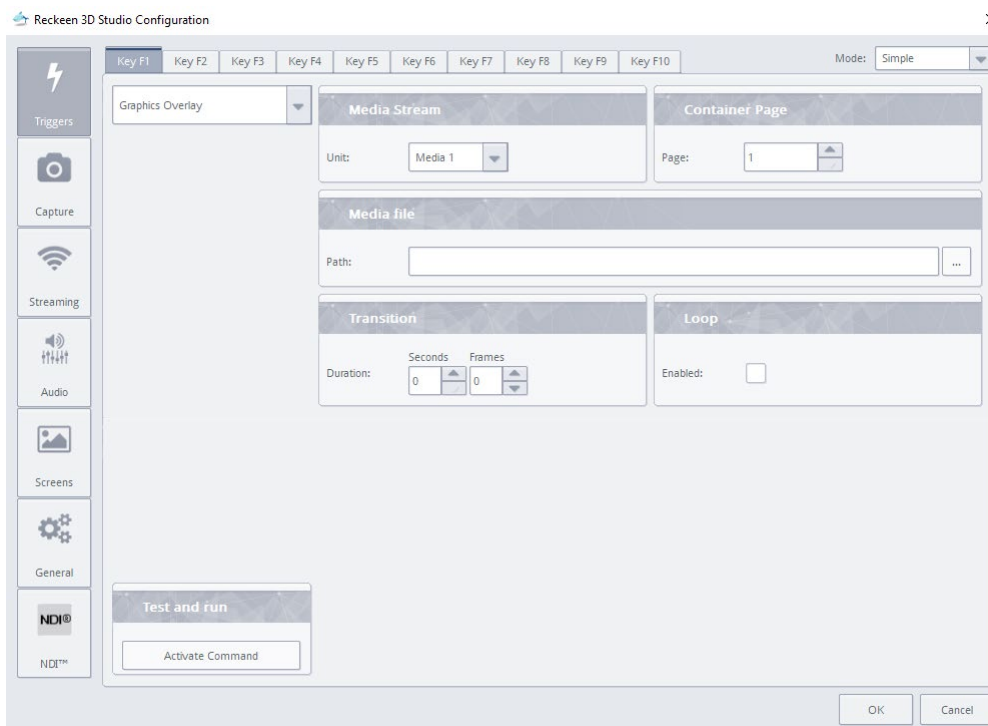
AUDIO	DSK	GENERAL	V/C	MEDIA	OUTPUT
Input: Mute	Set Position	Delay	Studio Load	Auto Play	Select Preview
Input: Solo	Set Preview		Select Camera	Loop Play	Select Program
Input: Volume	Set Rotation		Set Bus A Source	Pause	Transition Auto
Master Output: Mute	Set Scale		Set Bus B Source	Play	Transition Fade to Black
Master Output: Volume	Set Source		Set Bus C Source	Select	Transition Take
Output: Mute	Transition CUT		Set Bus D Source	Stop	
Output: Source	Transition MIX				
Output: Volume					

To assign a specific command to one of 10 function buttons **F-1** to **F10**, click on the **Triggers** icon in the Reckeen 3D system configuration window. Then select a Mode - **Simple** or **Advanced** - at top right side of the window.

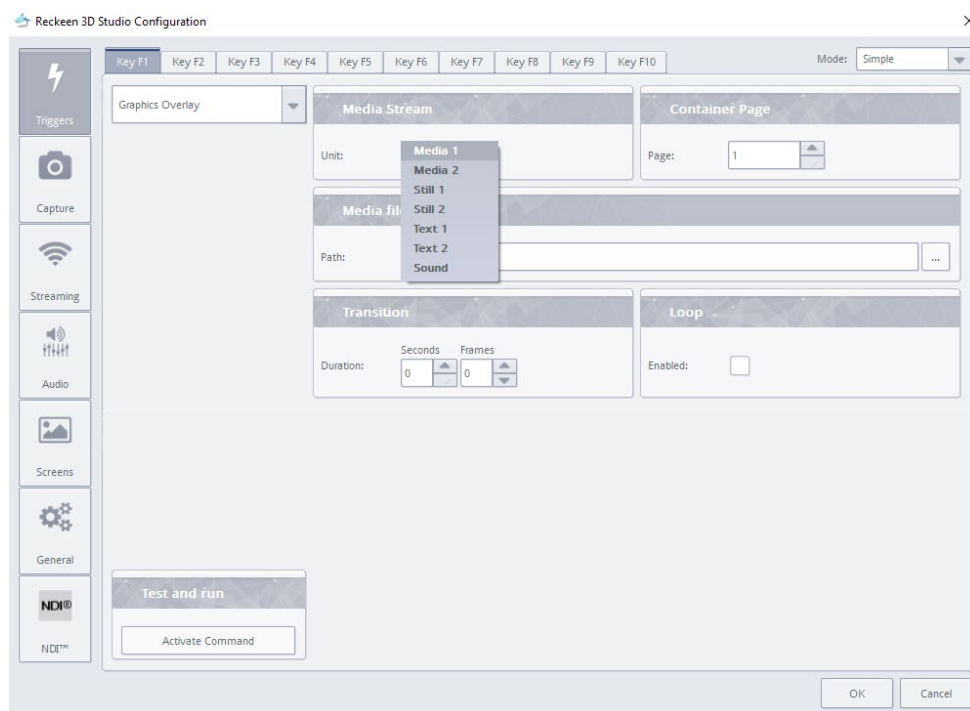


SIMPLE MODE

Let's set the **Trigger**, which is to be assigned to the **F1** key. The icon of Key **F1** tab is highlighted . First, in the upper right corner of the window, switch to **Simple** mode. In a **Simple** mode, click on an icon at the upper left side of the window, and you will be able to select **None** or **Graphics Overlay** from the drop-down list.



Graphics Overlay mode enables you to easily load a file with a chosen type of medium. Click on the white arrow in the **Media Stream** field and select the **type** (that is a tab from the media tray where you have placed your file) from the drop-down menu: **Still 1**, **Still 2**, **Text 1**, **Text 2**, **Media 1** **Media 2**, or **Sound**.





Choose a number of a page from the drop-down menu by clicking on the white arrow in the [Container Page](#) field.

The next step is to click the square button with [three dots](#) in the [Media file](#) field, to set the path to the file in the selected tab page of the tray.

A window reflecting a given [medium tray](#) (for example [Media 1](#)) will open. If the file of your interest does not exist, then you can [double-click](#) on an empty field and add it to the tray from the hard drive. This will create a file's icon ready to be chosen as a path.

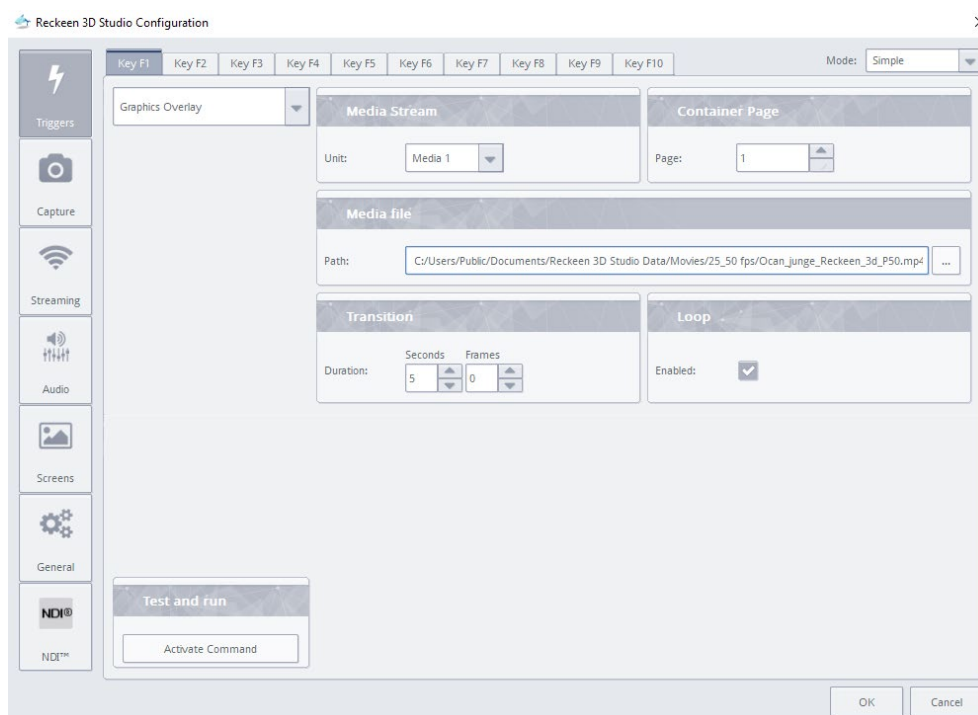
You can also set a manner in which the selected file enters on the vision. It is done by clicking on the [Transition](#) icon and setting the transition's duration - the number of seconds or frames. For [video files \(Media\)](#) and [Sound](#), a loop, that is playing a file repeatedly, can be enabled.

When the [Loop](#) is marked as active, the file will be visible on the air and played in a loop until the function button 'F' is pressed again by the user.

When the [Loop](#) is not checked, the file will be visible on the air and will end with its last frame, automatically leaving the [Program](#) image, i.e. turning the [Trigger](#) function off automatically.

The beginning and the end of the medium file take into account [Mark In](#) and [Mark Out](#) markers on the file, when you use it as a [Simple Trigger](#).

[Simple Trigger](#) supports full audio for a given file, so when the tray is [active](#) on a [mixer](#), the sound will appear at the system output when the [Trigger](#) is activated.



Simple Triggers are often used as additional scenery or special effects files, like for example semitransparent video files.

After setting all the parameters, click on the **Activate Command** icon at the bottom left of the window. If all the following actions were completed correctly, the command will be activated for a given key. If not - the system will inform you what yet remains to be set.

Normally, during the production, the functions are not triggered with **Activate Command** icon, but with the 'F' function keys located on the control panel's keyboard **vKEY-100** or **PC keyboard**.

ADVANCED MODE

First of all, it has to be said that the **PRODUCTION** module application is divided into functions that can be turned on and off with a mouse or a keyboard, like changing the state of a main **BUS** mixer or **DSK** settings. To facilitate your work, you can combine several functions creating a command sequence that can be programmed to be executed by one of the **Trigger** banks. A **Trigger** bank can be set off automatically with a single button. The functions are then triggered one after the other, creating interesting sequences. A classic use of **Triggers** is displaying content (pictures, videos) automatically at a specific time in the **PROGRAM** output. For example: setting **Media** as a source, introduction as **DSK**, its positioning, scale and rotation, going on the air at a certain time to **PROGRAM** and going off the air. Therefore, a **Trigger** is a programmed sequence of functions set off with a single button.

There are **10 Trigger** banks assigned to **F1** to **F10** function keys in the Reckeen 3D system.

Programming a Trigger:

Open **Menu> Options> Configuration> Triggers**.

When you open **Triggers** window, first select a key that will be programmed (**KeyF1** to **KeyF10**).

In the upper right corner of the window, select for this chosen key a **Mode** in which you will enter **Triggers: Simple** or **Advanced**. **Simple** Mode has been created for displaying videos, full screen pictures or for the sound file to go on the air quickly. In **Advanced** mode, you can freely combine functions of an entire application.

If for a certain key (e.g. **KeyF1**) you chose a mode (e.g. **Simple**), you can still assign both **Simple** and **Advanced** modes to the other keys (**KeyF2** to **KeyF10**).

At any given point of time, only one set of **Triggers** assigned to a specific function key can be executed in the Reckeen 3D system. The remaining function keys are not available until the termination of the functions. If you use **KeyF1**, you will not be able to activate another key, e.g. **KeyF2**, until all the functions stored in the bank are not completed. Operation of a given **KeyF** is signaled on the **VKey-100** control panel with its button illumination.

At any time, you can terminate the operation (stop executing the functions set) of the **KeyF** button by pressing the active key button again. However, a single internal function must reach its completion and only then the remaining **KeyF** keys will be unlocked. Pressing the same **KeyF** once again will not continue execution of the consecutive functions - an entire list of functions will start from the beginning.

Let's now discuss all the functions that can be programmed.

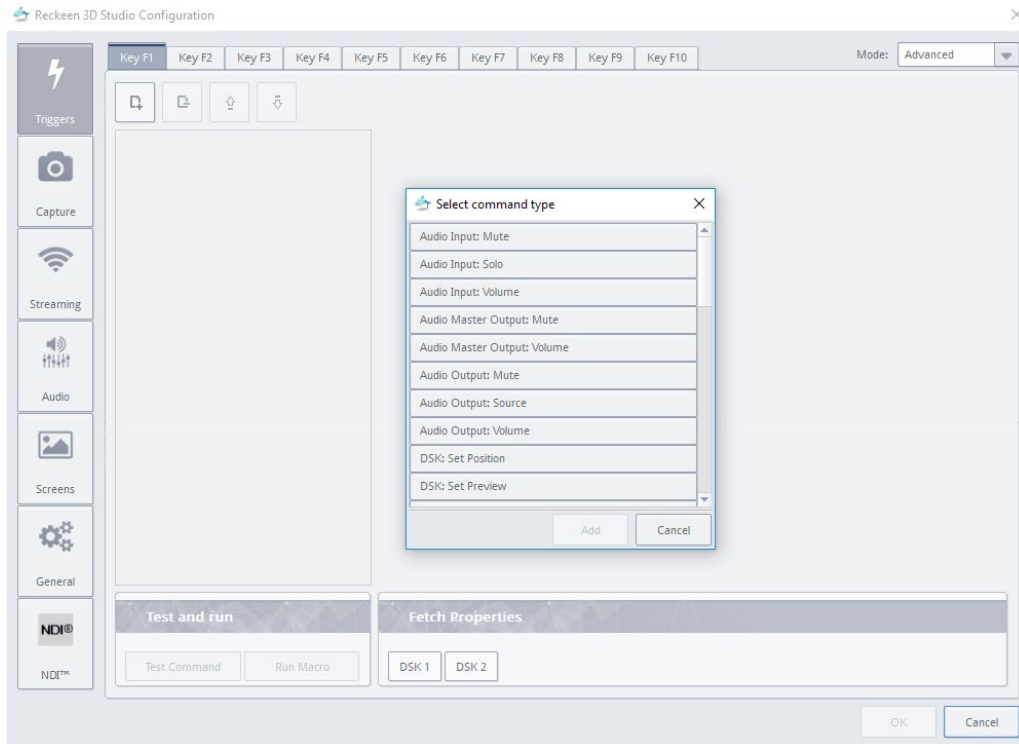
AUDIO: INPUT MUTE

In the audio mixer, each input has a separate slider for adjusting this input's signal level. Audio: Input Mute

function allows you to mute (enable Mute to) a single channel selected from the Audio Mixer's inputs. These are: Line In 1, Line In 2, Camera1, Camera2, Camera3, Camera4, MIC, Media 1, Media 2, and Sound.

For example, let's use Audio: Input Mute function to enable Mute option for a signal from a Camera1 input.

In order to add the function to a KeyF function key, press a square icon with a plus sign (see the image below).

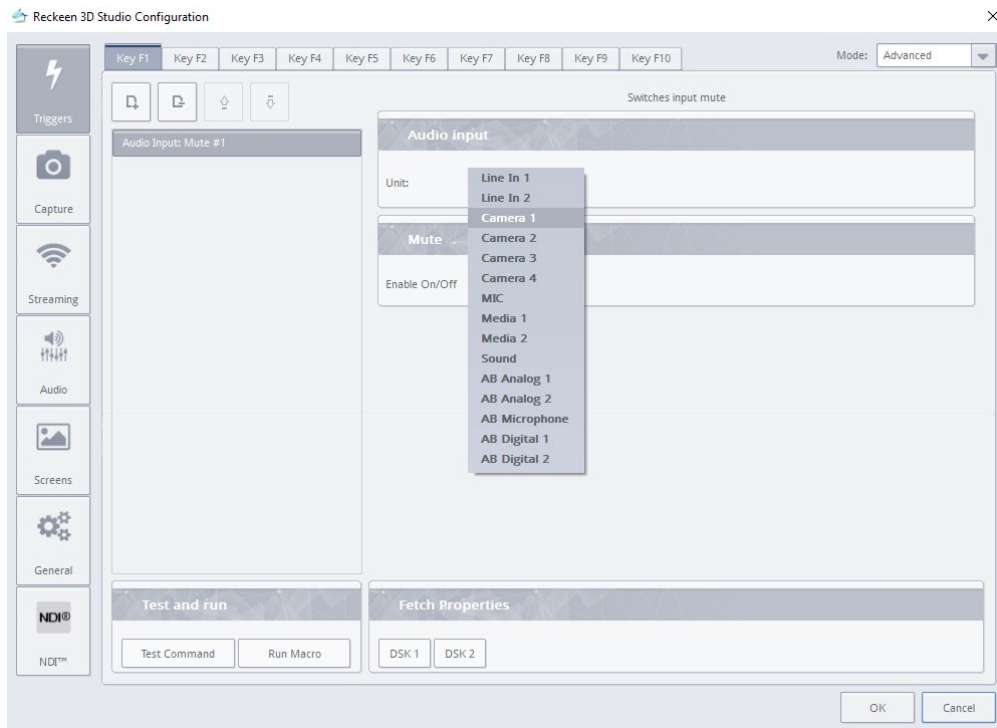


A drop-down list of functions will appear: Select command type. To select a function, highlight it with a cursor and double-click it or click on an icon: Add. The function will be added to the bank. In the same manner you can add more functions with different ranges.

To delete a chosen function, you have to move the cursor on it so that it becomes highlighted and press a button with a minus sign (as shown above). The function will be deleted.

After adding Audio Input: Mute, the following options will appear on the right side of the window: Audio Input and Mute.

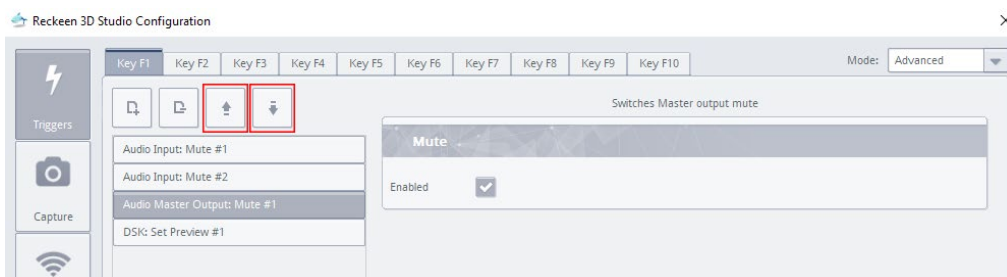
Audio Input option - from the drop-down list, choose an input to which you want to apply Mute function. Image below.



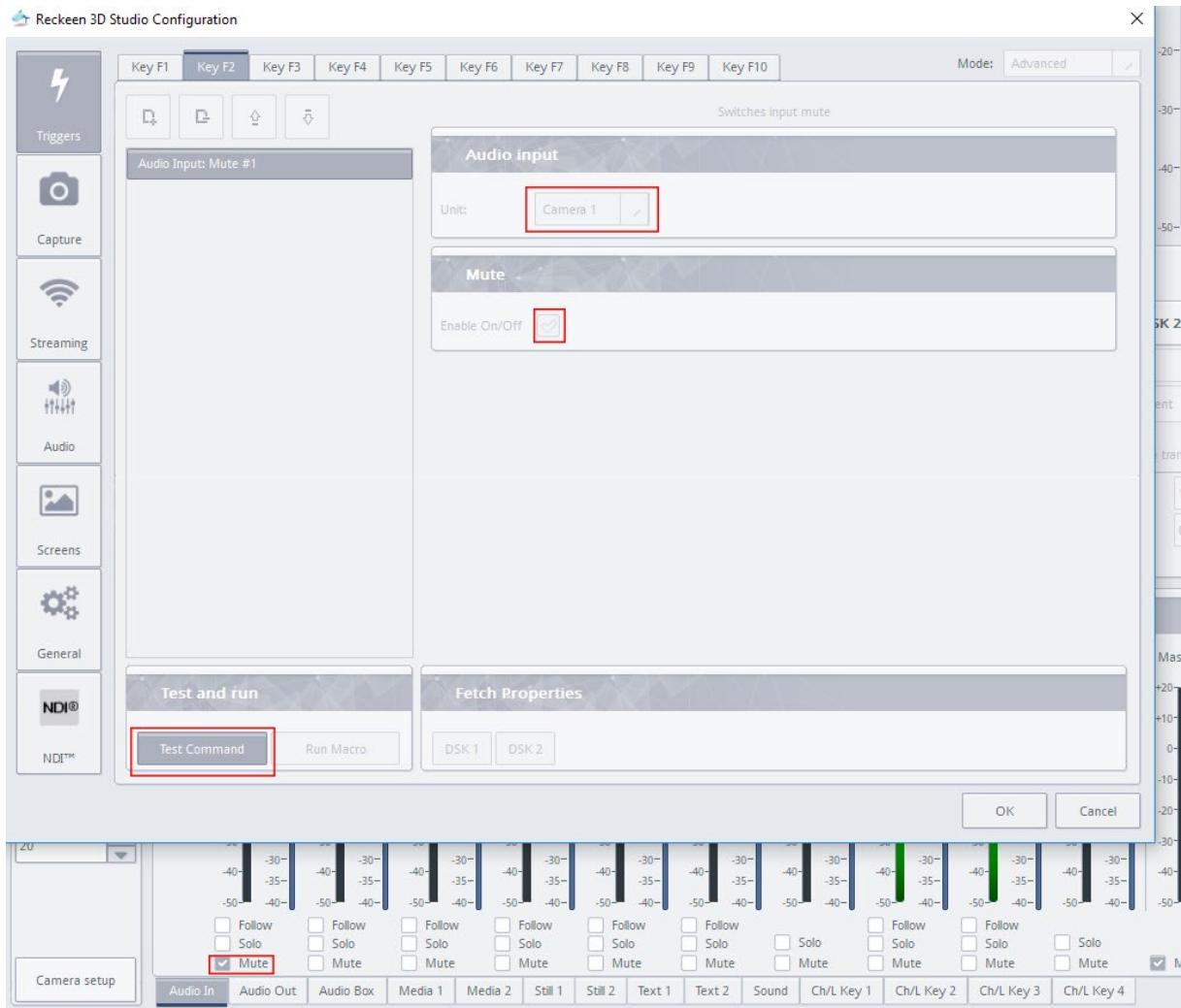
Mute option: when you tick the Enabled On / Off checkbox, it means you want to turn Mute function ON. That is, when the Trigger is activated by pressing the KeyF, the sound on Camera1 channel will be muted.

If the checkbox is not ticked, then pressing KeyF will turn Mute function OFF.

If there are several functions assigned to one KeyF, you can change their order. Select one of them and move it up or down using the cursor (as in the image below).



To test operation of a single function, highlight it with the cursor and press Test Command button on the screen. To turn the testing off, press Test Command button again with the cursor. Image below.



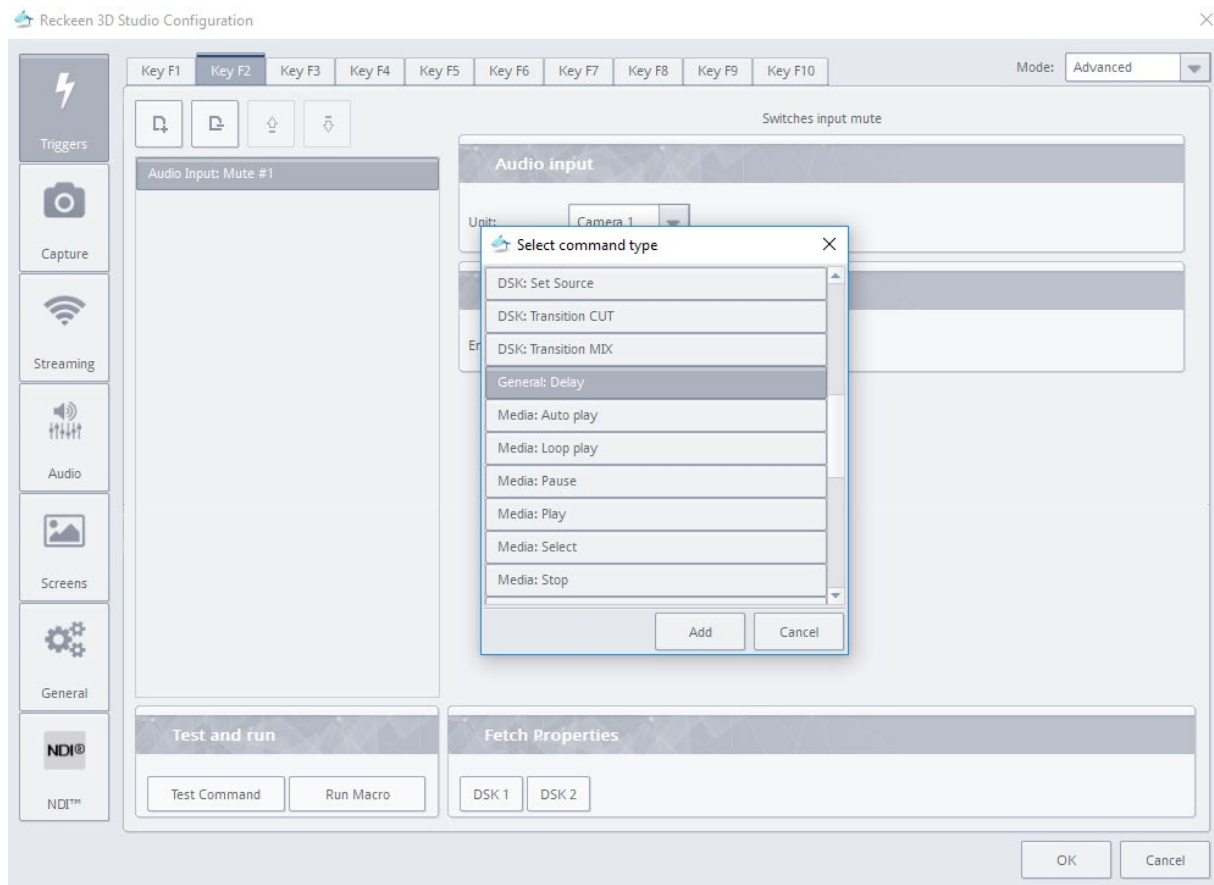
After pressing Test button for the selected Audio Input: Mute function, the sound will be muted. You can see on the screen that a MUTE checkbox under Camera1 slider in the Audio In settings is automatically ticked. Image above.

Run Macro button located on the right side, right next to Test Command button, allows you to test the entire set of functions assigned to the given KeyF's bank. Pressing Run Macro button should show you how the functions set would work if you pressed a physical function key F on a PC keyboard or on a VKey-100 control panel.

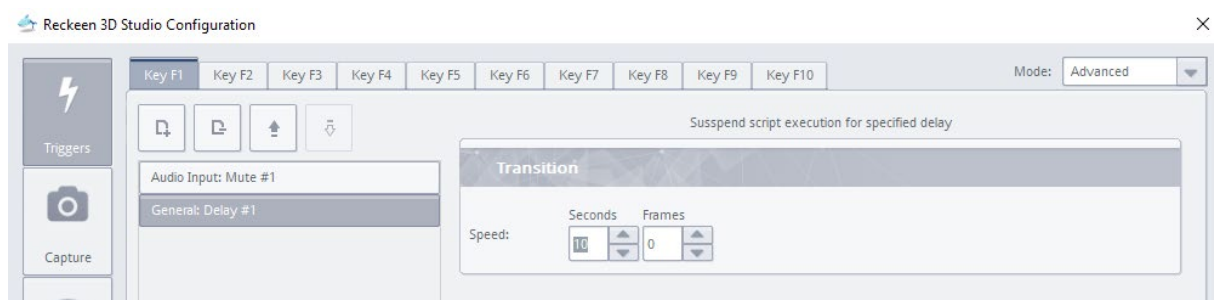
Example: We want to create a set of functions so that, when you press F1 key on a PC keyboard or on a VKey-100 control panel, the Camera1 sound is muted for 10 seconds.

We start with a function:

Audio: Input Mute - select Camera1 from the drop-down list in the Audio Input field. Tick Enabled On / Off checkbox, enabling the function. When you press plus button, select General Delay from the Select command type drop-down list. See the image below.

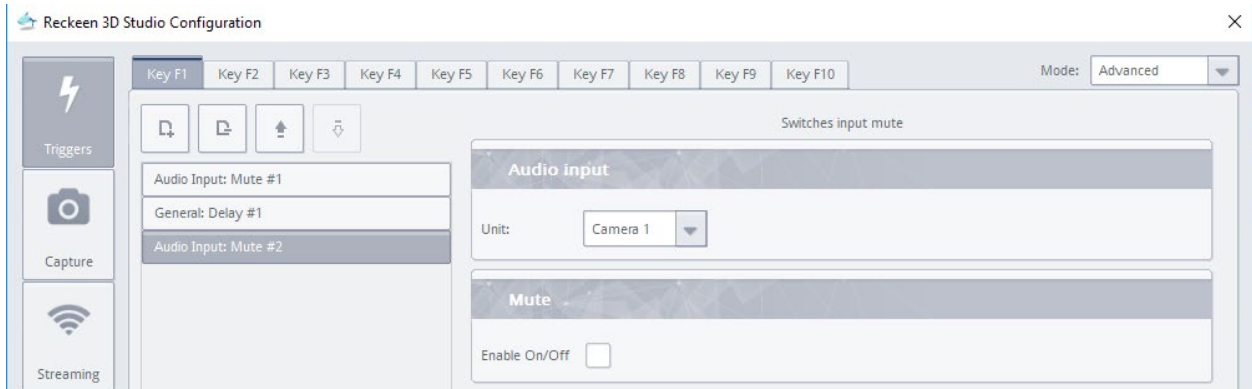


This function allows you to incorporate a pause defined in seconds or frames. We set a 10 seconds delay in the Transition field.



The General Delay function will be further described in the text.

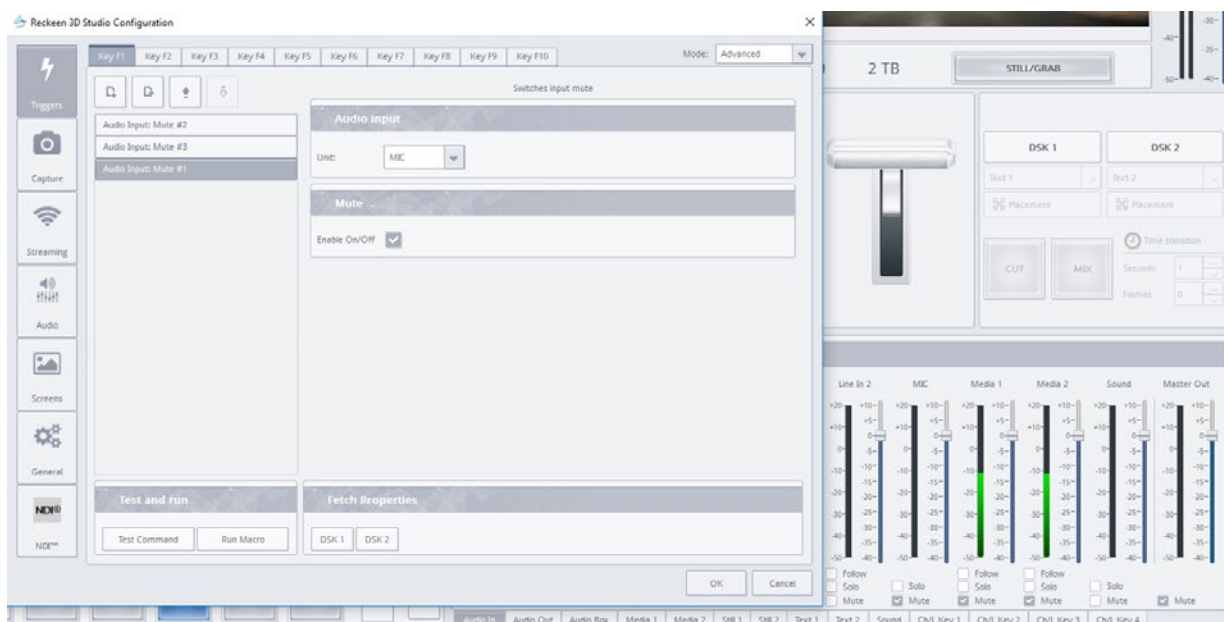
As a third one, add again Audio Input: Mute function from the dropdown list. Set it for Camera1, but this time do not tick the Enabled On / Off checkbox. This means Audio Input: Mute function for Camera1 will be disabled. Image below.



The whole sequence triggered with the function key will be as follows:

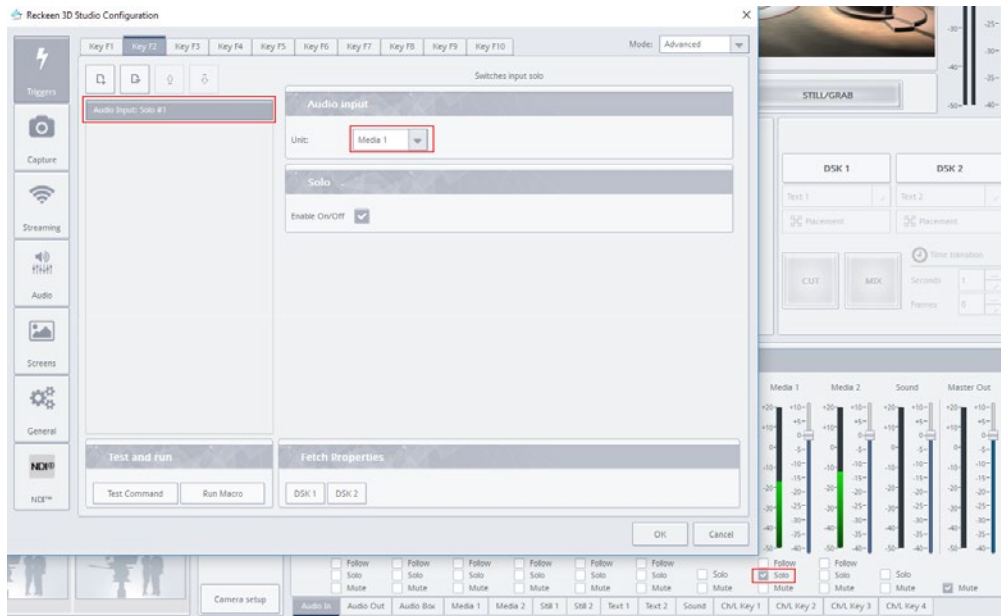
- Mute the sound of Camera1 channel.
- The mute lasts 10 seconds.
- Turn off mute for this channel.

Example: You can enable Audio Input: Mute for several input channels. Then, after turning on this Trigger, the Mute function will be enabled simultaneously for all the chosen sliders. All selected channels will be muted after pressing a single function key on the keyboard. The image below - muted channels: Media1, Media2, and MIC.



AUDIO INPUT: SOLO

This function is similar to Audio Input: Mute function, as you can see in the image below.



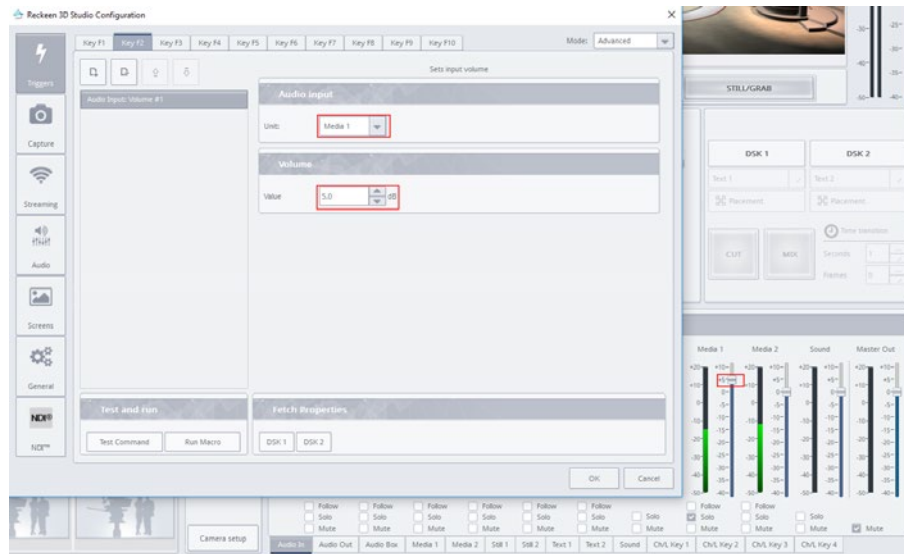
The difference is that with Audio Input: Mute function you can simultaneously silence several different Audio Inputs in the mixer, while using Audio Input: Solo function, you can only set one channel as Solo. This stems from the definition of a Solo function:

Solo - a feature that enables sending a selected signal individually to the output. Enabling this feature for the chosen channel mutes all the other input channels. Only the signal for which the Solo feature has been enabled is sent to the outputs.

AUDIO INPUT: VOLUME

With enabling this feature, you are able to increase or to lower a sound value for a selected input channel by setting an exact dB value of this channel's slider. After selecting a channel from Audio Input drop-down list, e.g. Media1, entering a value in the field, e.g. 5 dB, and enabling Audio Input: Volume, the Media1 channel volume slider will be set exactly in the position: 5 dB.

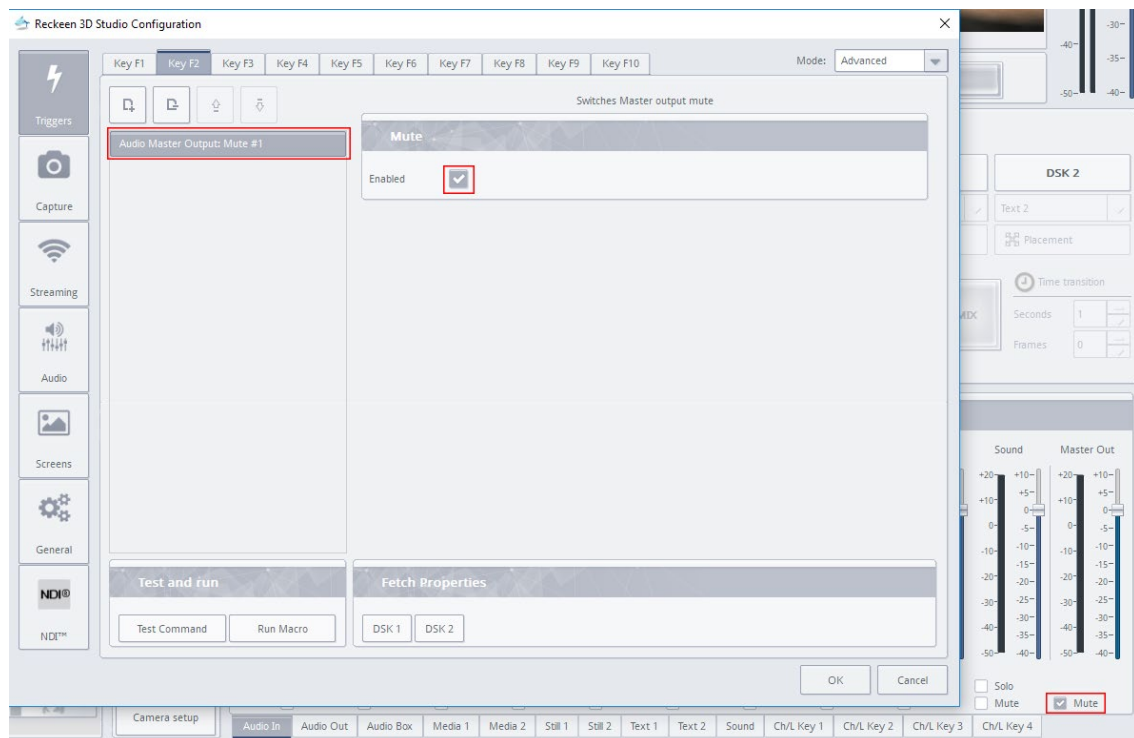
The image below.



AUDIO MASTER OUTPUT: MUTE

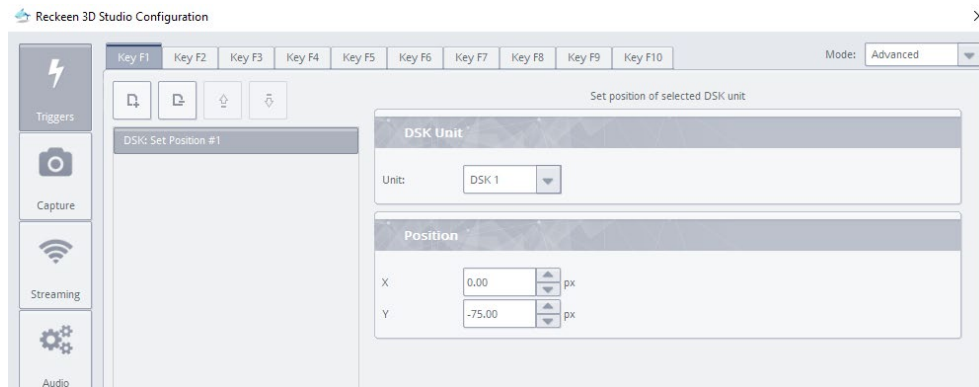
By enabling this function, you will mute the main output of the system, that is the Master Out slider.

The image below.



AUDIO: MASTER OUTPUT VOLUME

With enabling this feature you are able to increase or to lower the sound value for the system's main



Point $X = 0$, $Y = 0$ is located in the middle of a field with an output resolution for which a pixel is a unit. Values increase moving to the right for X and upwards for Y.

If you made an earlier attempt to set a position of a logo or a text on the screen with Placement for DSK function, you can read X and Y coordinates' values from the opened window. You can enter these values in the Position field. See the image below.

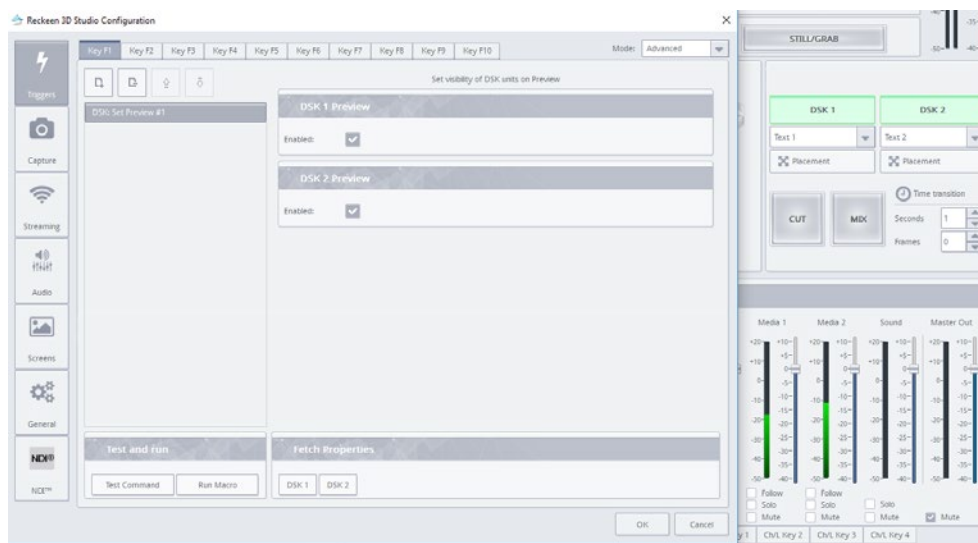


Enabling DSK: Set Position sets the parameters for DSK on the screen (e.g. logo's position), but does not enable DSK itself. To be able to see the effects of this function, DSK should have been made visible earlier on the PREVIEW screen (DSK buttons backlit in green).

In order to enable DSK on the screen, you have to use DSK: Set Preview function described below.

DSK: SET PREVIEW

Enabling this feature allows you to make DSK visible on Preview. You have to choose which DSK you want to enable by indicating it in the box: Set visibility of DSK units on Preview. You can turn both DSKs on at the same time, you just have to tick both Enabled checkboxes. When you press a key with this function, DSK content will be displayed on the Preview screen and DSK buttons will lit up green. The image below.



Example: the following task is to be accomplished: after pressing F1 function key, a logo from Text1 tray is to be assigned to DSK1, then enabled and positioned on the Preview screen at X=55, Y=01 coordinates. At the same time, a text from Text2 tray assigned to DSK2 is to be shown on the screen at X=65, Y=60.

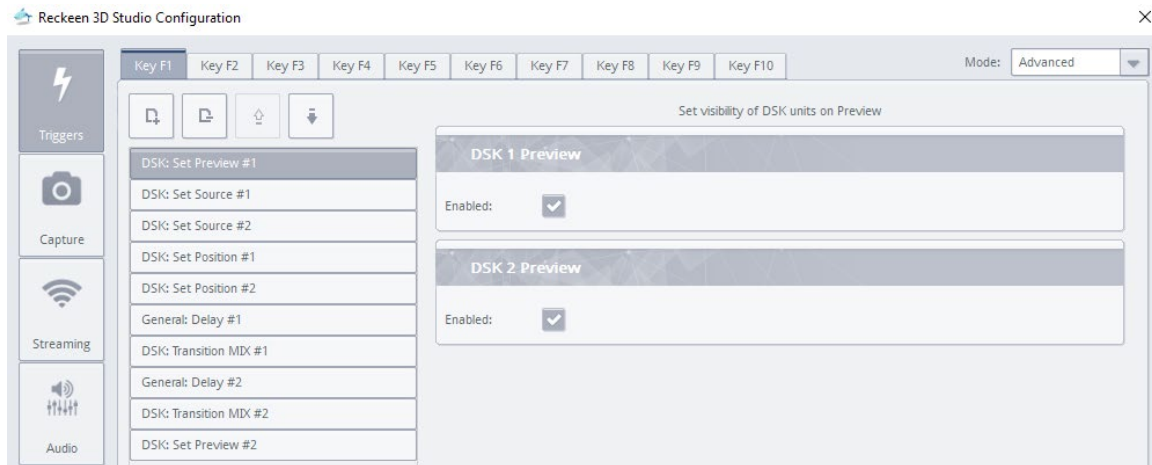
Then, after spending 5 seconds on the Preview screen, the text and the logo should appear on the Program screen via MIX transition with 3 seconds transition time. They are to be displayed for 10 seconds on the air. Then, after these 10 seconds, the text and the logo should be removed from the air via MIX transition with 3 seconds transition time.

A description of the whole procedure will be as follows:

- Select one of the KeyF keys in the Triggers window, e.g. Key F1. Select Advanced mode in the upper right corner of the window.
- From the Select command type drop-down list add DSK: Set Preview function using Add button and then, tick both Enabled checkboxes, enabling this function for DSK1 and DSK2 on Preview.
- Then, add DSK: Set Source function from the drop-down list, set DSK1 in DSK Unit field and Text1 in DSK Stream field.
- Next, once again select and add DSK: Set Source function setting DSK2 in DSK Unit field and Text2 in DSK Stream field.
- Afterwards, select and add DSK: Set Position function from the drop-down list. In the Unit field, select DSK1 and set the logo's desired position on the screen. That is, X=55, Y=01.
- Add DSK: Set Position function once again. In the Unit field, select DSK2 and set a position the text is to have on the screen, i.e. X=65, Y=60
- Then, add General Delay function and set a delay of 5 seconds. It will be a time in which the logo and the text will be displayed the Preview screen.
- Now, add DSK: Transition MIX function with Transition time of 3 seconds, which will allow the logo and the text to enter the Program screen.
- Add General Delay function again with a delay of 10 seconds, which will be the time the logo and text remain on the Program screen.

- After that, add DSK: Transition MIX function with Transition time of 3 seconds, which will allow the logo and the text to go off the air to the Preview screen.
- At the end, add DSK: Set Preview function - and leave the two Enabled checkboxes unchecked, i.e. turn DSK1 and DSK2 off.

The image below.



The whole sequence triggered by pressing F1 function key will look like this: DSK1 and DSK2 buttons are being turned on. In the application, both DSK buttons light up green. Simultaneously, a source for DSK1 and for DSK2 is selected. At the same time, positions of the logo and the text are set. The logo and the text remain on the Preview screen for 5 seconds. They go on the air on the Program screen via MIX transition that lasts 3 seconds. They remain on the air for 10 seconds. They go off the air to the Preview screen via MIX transition lasting 3 seconds. Both DSKs are being turned off.

Note: Additional interesting use: The situation where you have more than one file in the tray from which you will be importing a source for DSK (as in the example above, Text1 and Text2 trays). Then, you can add Media: Select function (described later in the text) before using DSK: Set Source function. This will allow you to select a precise tab in the tray and then select a file that you want to assign to DSK.

DSK: SET ROTATION

Enabling this feature allows you to rotate by a chosen angle a logo, a text, etc. assigned to DSK.

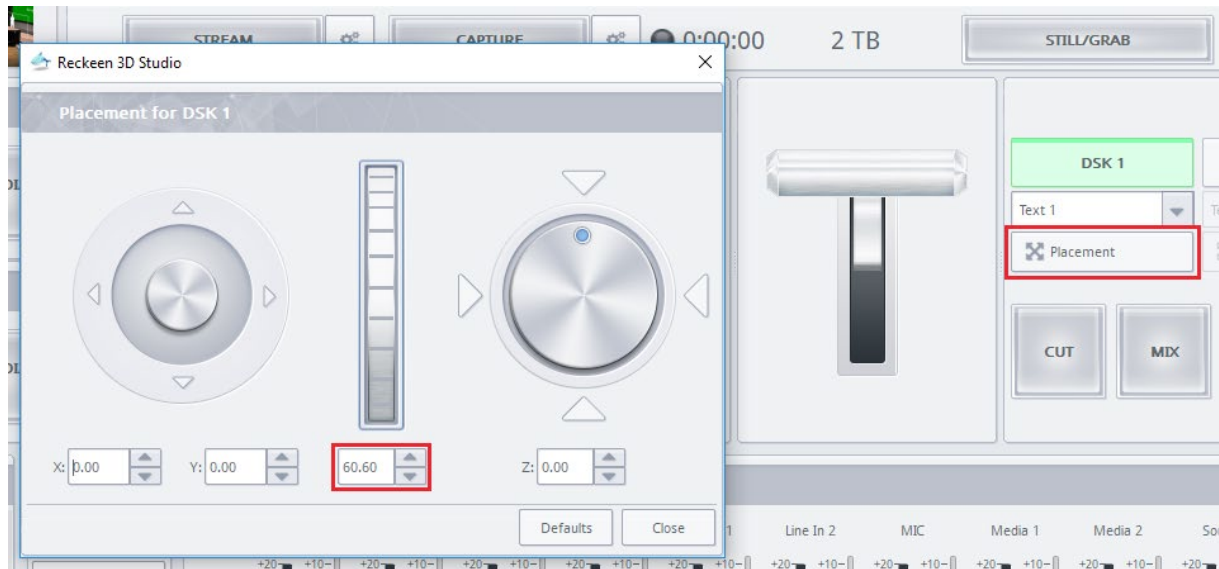
First, in the DSK Unit field, select to which DSK this rotation is to be applied, and then, in the Rotation field, enter an angle of rotation in degrees.

DSK: SET SCALE

Enabling this feature allows you to enlarge a logo or a text loaded into DSK.

First, in the DSK Unit field, select to which DSK this enlargement is to be applied, and then, in the Scale field, enter an enlargement value in %.

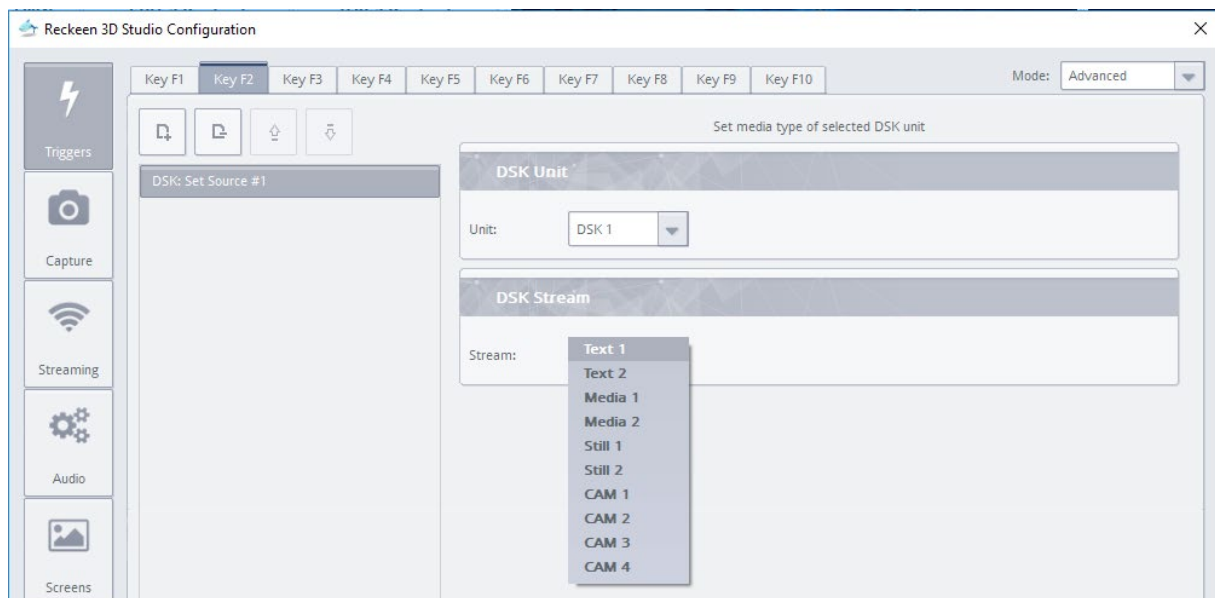
You can determine the enlargement value in % by trial and error. Enable DSK, press Placement button and set the desired enlargement with a center scroll wheel. Read the value in the field below, as in the image below.



DSK: SET SOURCE

This feature allows you to set a source, i.e. which media or images tray should be assigned to which DSK. A live image source from CAM1 - CAM4 can also be used here.

First, choose DSK1 or DSK2 in the DSK Unit field and then, from the drop-down list, select a tray for the chosen DSK. You can choose from among: Text1, Text2, Media1, Media2, Still1, Still2, CAM1 - CAM4. See the image below.

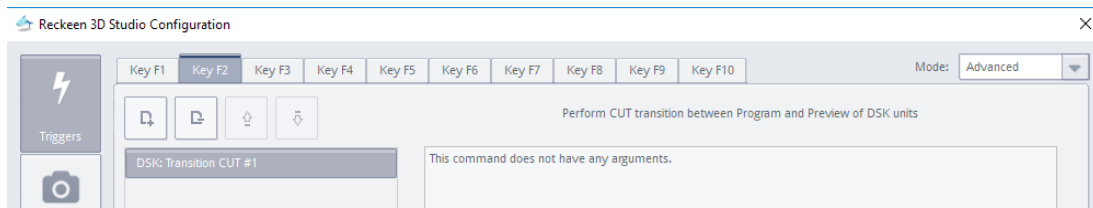


DSK: TRANSITION CUT

With this feature, you can move content (logo, subtitles, etc.) from the Preview screen to Program via Cut transition, that is, immediately, without delay. This function also allows you to remove the content from

the air (Program) back to the Preview screen.

Caption: 'This command does not have any arguments' means that there is no need to enter any values for this function. The image below.

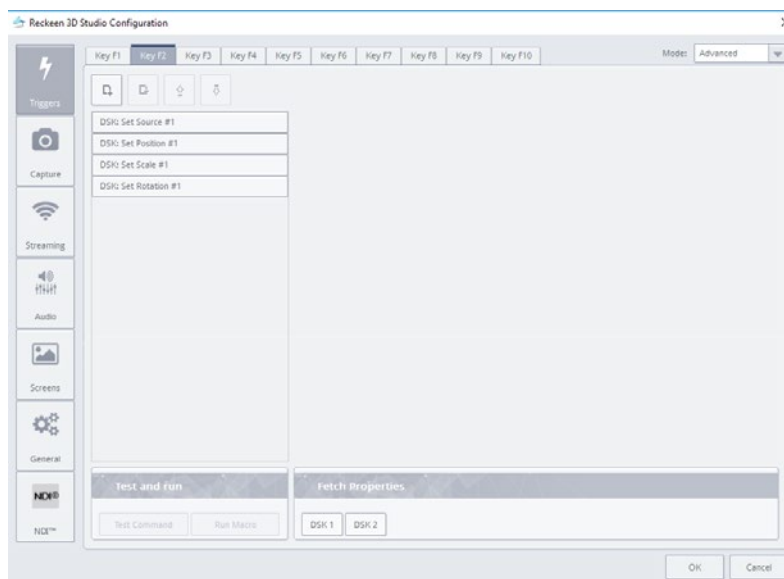


DSK: TRANSITION MIX

Just like the previous one, this function allows you to move content (logo, subtitles, etc.) from the Preview screen to Program, but via Fade transition. You can set the speed, that is duration, of this transition in seconds or in frames. This function also allows you to remove the content from the air (Program) back to the Preview screen.

FETCH PROPERTIES DSK1 DSK2

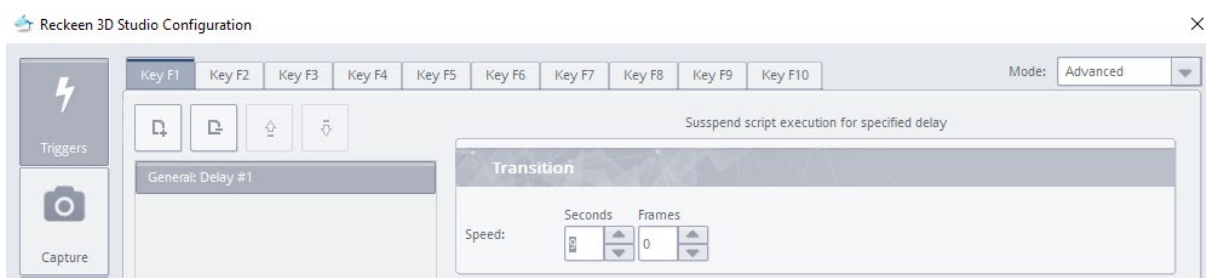
As the certain set of functions is repeated frequently when programming the Triggers for DSK, in order to facilitate your work, Fetch Properties panel has been placed at the bottom of the window. This allows you to load a sequence of the most commonly used functions for DSK by pressing a button for a given DSK. See the image below.



When you press the second of the two DSK buttons, a subsequent set of functions will be loaded. You have to pay attention which function has been highlighted last, as a beginning of an inserted new sequence will be in that place.

GENERAL DELAY

This feature allows you to insert a pause between other functions. The duration of such pause is set in seconds or in frames in the field: Transition.



MEDIA: AUTO PLAY

This feature allows you to turn Auto Play function on for a chosen tray: Media1, Media2, Still1, Still2, Text1 or Text2. When you enable Media: Auto Play feature, a file from the tray will start playing from the beginning when going on the air (i.e. to the Program screen), regardless of whether it is to be displayed full screen or on a virtual screen in the scenography. If a Mark in tag has been set for the file, the file will start playing from that point. If this is a Play list, it will start from the beginning of the first file or from the Mark in tag in the first file. The image below.



MEDIA: LOOP PLAY

This feature allows you to turn Loop function on (plays back a file in a loop) for a chosen tray: Media1, Media2, Still1, Still2, Text1, Text2 or Sound.

MEDIA: PAUSE

This feature allows you to turn Pause function on (pauses playing back a file) for a chosen tray: Media1, Media2, Still1, Still2, Text1, Text2 or Sound.

MEDIA: PLAY

This feature allows you to turn Play function on (plays back a file) for a chosen tray: Media1, Media2, Still1, Still2, Text1, Text2 or Sound.

MEDIA: SELECT

If you have more than one file to choose from as a source in the tray, Media: Select function will allow you to select a proper file. First, from the drop-down list in the Media Stream field select a tray: Media1, Media2, Still 1, Still2, Text1, Text 2 or Sound. Then, in the Container Page field, select Page tab number, and in the Media File field, set a path to the file by clicking on an icon with 3 dots. Files (or rather their shortcut icons, as the files themselves remain on the disk and are not copied to the trays) can be added earlier to the tray and so that they appear in the window. If you want to add a shortcut to a file that is not in the tray, but is on the disk, click on the black background in the open window, not on any of the files shortcuts' icons. You will be automatically transferred to the folders on the disk. After selecting the file from the disk and clicking on it, its shortcut icon is added to the tray.

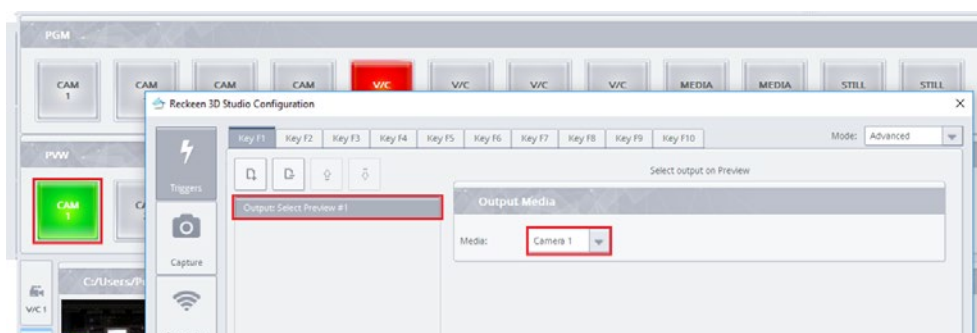
Note: When you play a sequence of multiple files (All Play) from a given tray and you use Triggers function Media: Select concerning one of the files in the sequence, then the sequence will be turned off and solely the selected file will be played.

MEDIA: STOP

This feature allows you to turn Stop function on (stops playing back a file, the next playback will start from the beginning of the file) for a chosen tray: Media1, Media2, Still1, Still2, Text1, Text2 or Sound.

OUTPUT: SELECT PREVIEW

With this feature you can choose what is to be visible on the Preview screen after pressing a function key. Select a source from the drop-down list in the Output Media field. This function operates on the bottom line (Bus) of the video mixer's PRV (Preview) buttons. The active button is backlit in green. When you press a key with Output: Select Preview function assigned, a button with the selected source will light up green. The image below.



OUTPUT: SELECT PROGRAM

With this feature you can choose what is to be visible on the Program screen after pressing a function key. Select a source from the drop-down list in the Output Media field. This function operates on the upper line (Bus) of the video mixer's PRG (Program) buttons. The active button is backlit in red. When you press

a key with Output: Select Program function assigned, a button with the selected source will light up red.

OUTPUT: TRANSITION MIX

This function is used to make the content shown on the Preview screen go on the air to the Program screen. The same operation is performed by V-Key 100 T-bar handle or a T-bar handle on the production screen. You can set T-bar's transition time in seconds or in frames in the Transition field.

OUTPUT: TRANSITION FADE TO BLACK

When you enable this function the Program screen will make a transition to black. All you need is to tick Enabled checkbox. If you leave the box unchecked, you will get an opposite function, i.e. the black screen will be turned off.

OUTPUT: TRANSITION TAKE

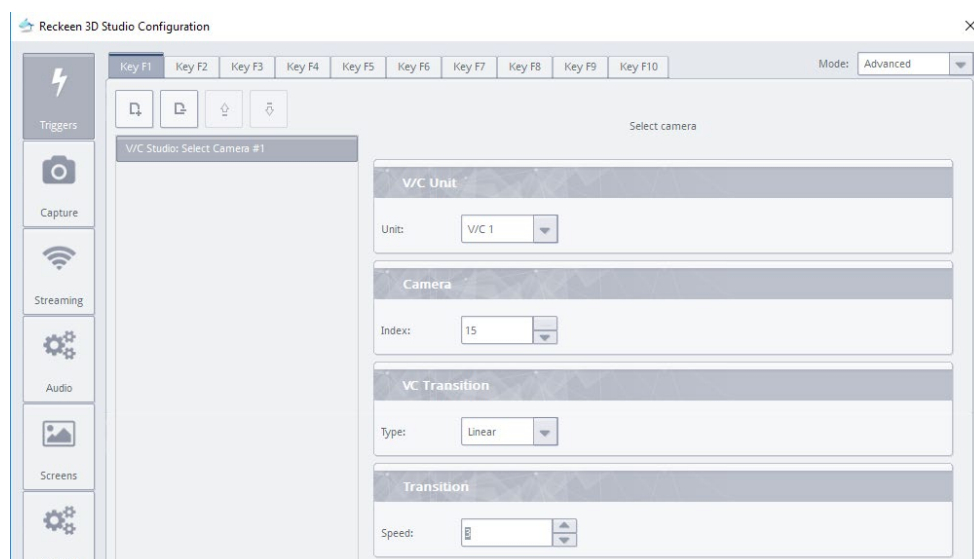
Just as the MIX function, this function is used to make the content shown on the Preview screen go on the air to the Program screen. The only difference is that it is implemented in an instant, without delay.

V/C STUDIO: LOAD

With this function, you can load a chosen studio from the hard drive. The path to the studio file is set in the Studio File field.

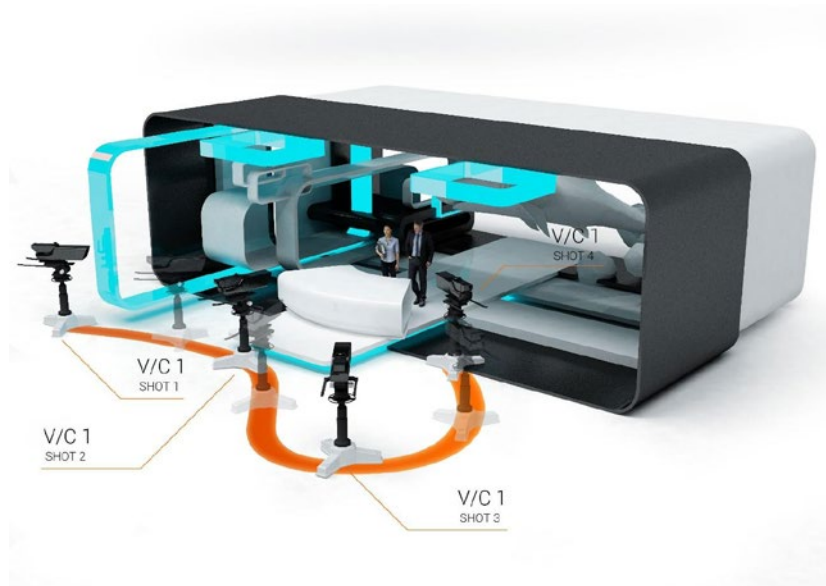
V/C STUDIO: SELECT CAMERA

This function is used to enable a particular camera shot. First, select a virtual cameraman (V/C1 to V/C4) in the V/C Unit field. Later, select a shot's index (1 to 15) in the Camera field and then, select a type of a virtual camera movement in the V/C Transition field. Should the camera move around the studio in a linear fashion: Linear or in a curved one: Curved (real dynamic). The last value to set is a speed of the virtual camera motion in 3D studio - in the Speed field. The image below.



Note that, for this function to be executed, image from this virtual camera V/C has to be on the air, that is on the PROGRAM screen.

Let's assume that a virtual cameraman V/C1 is in a certain position in the studio (e.g. SHOT 1). When you are programming a Trigger for this V/C1 cameraman, the camera moves (Linear or Curved) to SHOT 2 at an indicated speed after the KeyF is activated. The image below.



This way you can design a path a camera moves along. To Key F1 you can assign V/C 1 cameraman's movement to SHOT 2, make a close-up to the presenter (talent), to Key F2 you can assign V/C 1 cameraman's movement to SHOT 3 and so on.

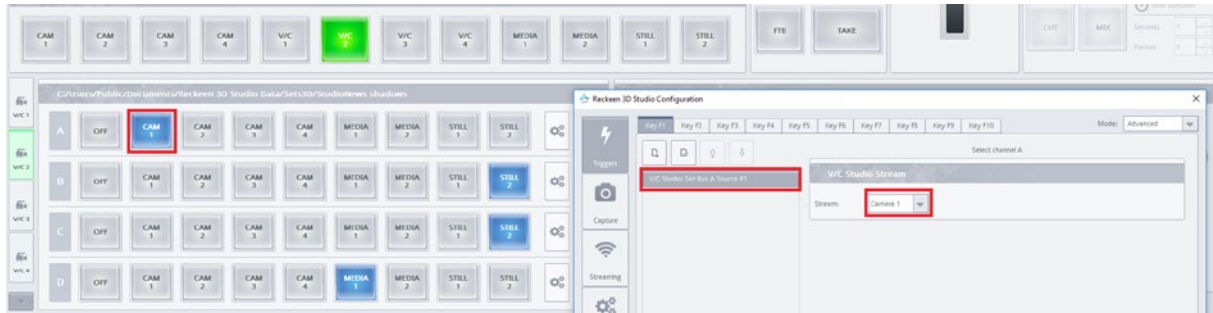
This function has one more important feature. Typically, during production, when you go through consecutive shots of a virtual camera, they all have the same transition speed and Linear or Curved (real dynamic) type set. However, a camera movement programmed with V/C Studio: Select Camera function can have any speed and movement type set. Therefore, the camera path composed of sequences triggered by F keys can have different transition speed and type parameters in each part of motion.

V/C STUDIO: SET BUS A SOURCE

With this feature, you can set a signal source A in your studio. The function operates on line A buttons on an additional panel in the lower left corner of the screen. On this panel, you can select A, B, C and D signal sources for your studio.

Select a source from a drop-down list in the V/C Studio Stream field. When you press a key with V/C Studio: Set Bus A Source function assigned, a button with the selected source will light up on the panel.

Image below shows a selected source: Camera1.



The active CAM1 button is backlit on the panel.

V/C Studio: Set Bus B Source function allows you to set a source for the line B,

V/C Studio: Set Bus C Source function - a source for line C and consequently,

V/C Studio: Set Bus D Source function - for line D.



External Keyboard –
Shortcuts

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RECKEEN 3D STUDIO SHORTCUTS

Module	Function	Shortcut
Vision Mixer (Production Switcher)	Source Selection PGM :CAM1...Still2	1 ... +
Vision Mixer (Production Switcher)	Source Selection PRV : CAM1...Still2	Q ...]
Transition	FTB	Ctrl+B
Transition	Take	Return
Transition	Auto	Space
DSK	DSK 1	Insert
DSK	DSK 2	Home
DSK	DSK 1 - select next item from list	Delete
DSK	DSK 2 - select next item from list	End
DSK	DSK Cut	Page Up
DSK	DSK Mix	Page Down
	Stream	F12
	Capture	Scroll Lock
	Still/Grab	Pause/Break
	Programming Trigger Buttons	F1-F10
Media Trays	Tray Selection: Audio In ... Sound	Ctrl + F1 ... Ctrl + F9
Media Trays	Stop in active Tray	K
Media Trays	Play in active Tray	L

Media Trays	Loop in active Tray	apostrophe '
Media Trays	Tab selection in active Tray	Ctrl+1 .. Ctrl+5
V/C Shots	Speed Transition Slow	Num /
V/C Shots	Speed Transition Medium	Num *
V/C Shots	Speed Transition Fast	Num -
V/C Shots	Shot selection in active V/C (the first 10 shots) – move	Num: 0..9
V/C Shots	Shot selection in active V/C (the first 10 shots) – cut	Shift + Num 0..9
ABCD Mixer	Source Selection A OFF...Still 2	Alt +1 ... Alt + 9
ABCD Mixer	Source Selection B OFF...Still 2	Alt + Q ... Alt + O
ABCD Mixer	Source Selection C OFF...Still 2	Alt + A ... Alt + L
ABCD Mixer	Source Selection D OFF...Still 2	Alt + Z ... Alt + .
	Configuration Window	Ctrl+P
	Camera Setup	C
	3D Editor	V
	Load 3D Studio	Ctrl + L
Camera Setup	V/C Selection	Num: 0..9
Camera Setup	Undo/Redo	Ctrl+Z, Ctrl + Y
Camera Setup	Close	ESC
3D Editor	Delete the selected object	Delete
3D Editor	Add a new object	Insert

3D Editor	Undo/Redo	Ctrl+Z, Ctrl + Y
3D Editor	Move Mode	Alt + Z
3D Editor	Rotate Mode	Alt + X
3D Editor	Scale Mode	Alt + C
3D Editor	Deselect the object	Space
3D Editor	Wizard	CTRL + W
3D Editor	Close	ESC
3D Editor	View Mode	1..7

RECKEEN LITE SHORTCUTS

Module	Function	Shortcut
Vision Mixer (Production Switcher)	Source Selection PGM :CAM1...Still2	1 ... +
Vision Mixer (Production Switcher)	Source Selection PRV : CAM1...Still2	Q ...]
Transition	FTB	Ctrl+B
Transition	Take	Return
Transition	Auto	Space
DSK	DSK 1	Insert
DSK	DSK 2	Home
DSK	DSK 1 - select next item from list	Delete
DSK	DSK 2 - select next item from list	End

DSK	DSK Cut	Page Up
DSK	DSK Mix	Page Down
	Stream	F12
	Capture	Scroll Lock
	Still/Grab	Pause/Break
	Programming Trigger Buttons	F1-F10
Media Trays	Tray Selection: Audio In ... Sound	Ctrl + F1 ... Ctrl + F9
Media Trays	Stop in active Tray	K
Media Trays	Play in active Tray	L
Media Trays	Autoplay in active Tray	;
Media Trays	Loop in active Tray	apostrophe '
Media Trays	Tab selection in active Tray	Ctrl+1 .. Ctrl+5
V/C Phase	Speed Transition Slow	Num /
V/C Phase	Speed Transition Medium	Num *
V/C Phase	Speed Transition Fast	Num -
V/C Phase	Phase selection in active V/C (Phase1...4) – move	Num: 0..3
V/C Phase	Phase selection in active V/C (Phase1...4) – cut	Shift + Num 0..3
ABCD Mixer	Source Selection A OFF...Still 2	Alt +1 ... Alt + 9
ABCD Mixer	Source Selection B OFF...Still 2	Alt + Q ... Alt + O
ABCD Mixer	Source Selection C OFF...Still 2	Alt + A ... Alt + L

ABCD Mixer	Source Selection D OFF...Still 2	Alt + Z ... Alt + .
	Configuration Window	Ctrl + C
	Load Studio	Ctrl + L

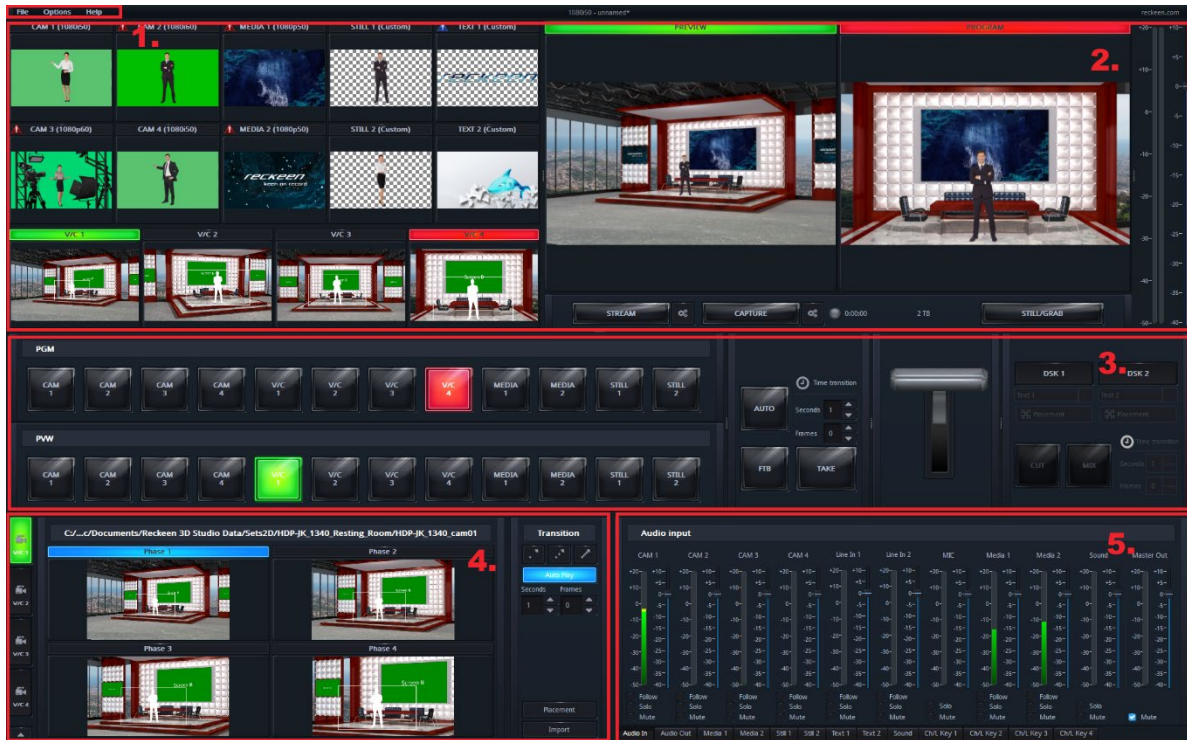


Reckeen LITE : Production
module screen

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After clicking on the **LITE Production** icon on the start screen, the main module of the system appears on the screen. It's a kind of an executive center, where most of the Reckeen LITE system production functions are activated from.

The screen of LITE Production for Reckeen LITE Studio (Black Style)



The production screen area can be divided into five main areas, the same as the **3D Production version**:

1. Toolbar
2. Multiview Panel (previews panel)
3. Vision Mixer (production switcher)
4. Virtual studio Configuration Panel
5. Media trays

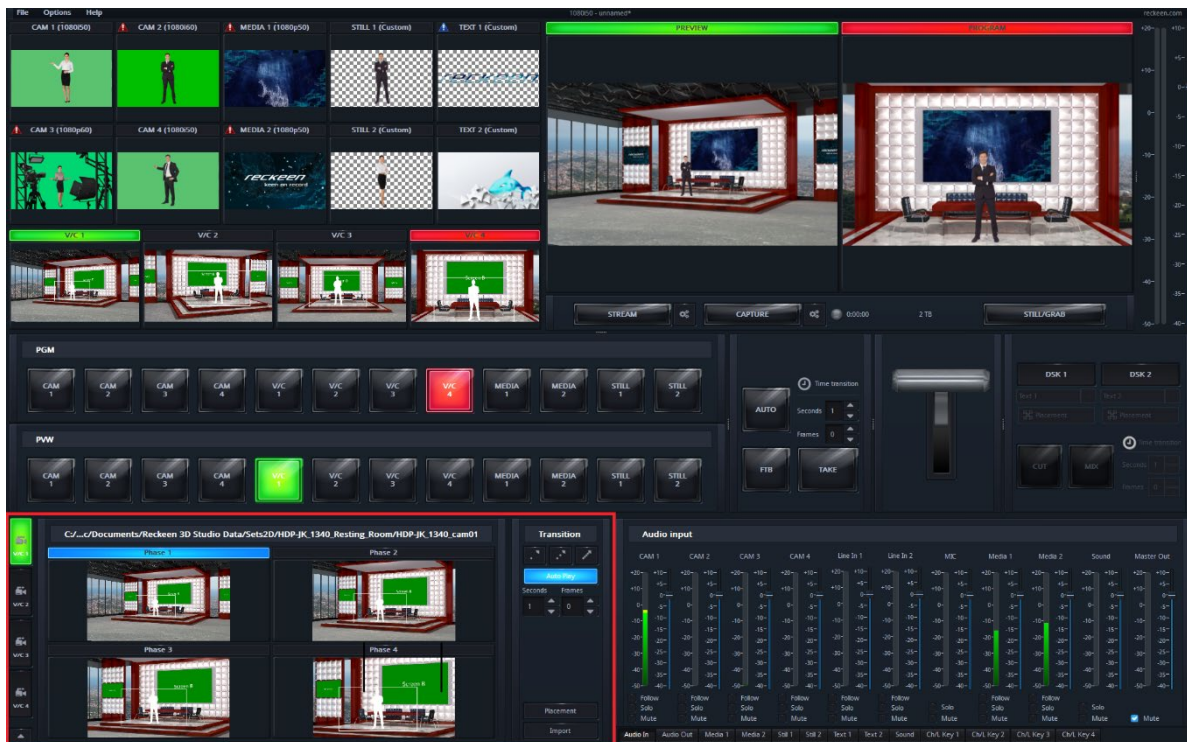
Areas described in points 1, 2, 3 and 5 are common to both systems: Reckeen 3D Studio and Reckeen LITE . These areas have already been described in the manual. Please see the corresponding chapters. The area **Virtual studio Configuration Panel** , needs to be discussed in detail below.



Reckeen LITE: Virtual studio
Configuration Panel.

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After opening a production screen of [LITE Production](#), you will find the virtual studio [Configuration Panel](#) in the lower left corner. The Reckeen LITE Studio system will always open a new session with a starting studio loaded. Picture below.



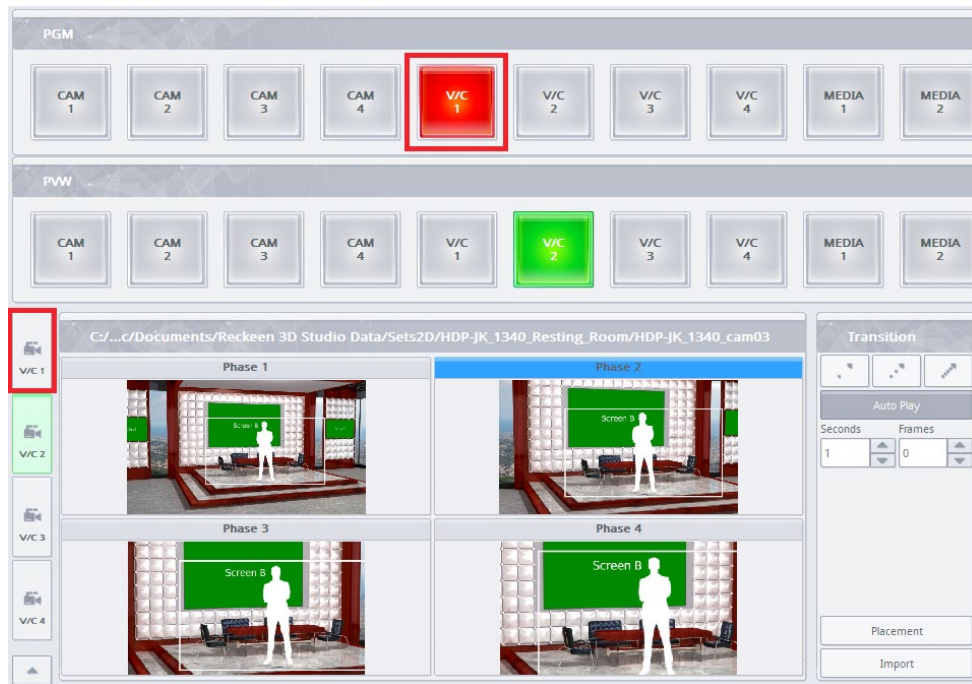
A studio file's path on the disk is displayed at the top of the panel. See the image below:



The Reckeen LITE Studio system is equipped with 4 V/C channels, that is [Virtual Cameras](#). The backlit buttons [V/C 1](#) to [V/C 4](#) on the left side of the configuration panel allow you to choose which group of V/C shots you can currently configure.

The V/C buttons in the panel are fully compatible with the main [video mixer](#). If you change the status of the main mixer (switch the [V/C](#) on the [mixer](#)), whether it is in [PREVIEW \(PVW\)](#) section or [PROGRAM \(PGM\)](#) section, the button in V/C control panel will switch automatically. V/C tab button is highlighted in [red](#) when the virtual camera V/C to which it is

assigned, is on the air, that is, in a live signal on the **PROGRAM** screen. And when the button is highlighted in green, it means the virtual camera **V/C** image is displayed on the **PREVIEW** screen. See the image below

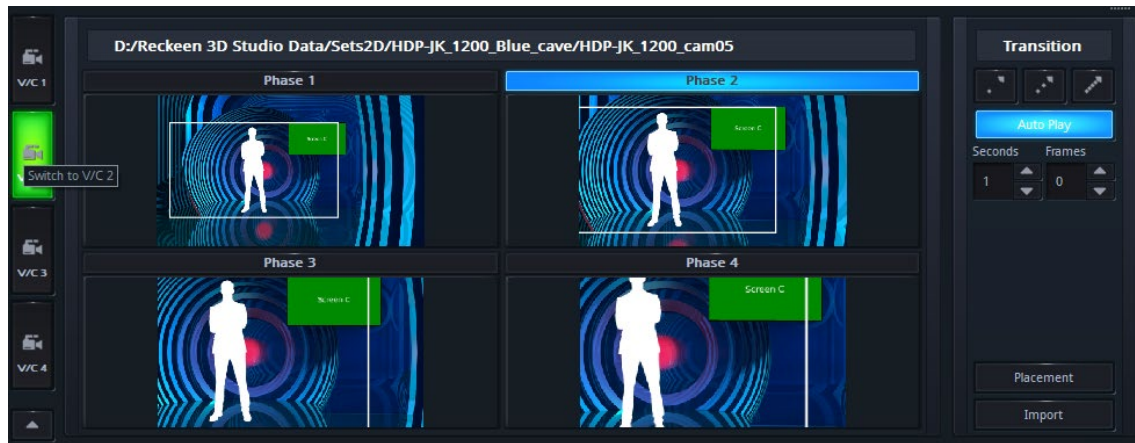


Each **V/C** shot of the studio enables definition of virtual camera movements in 4 different phases.

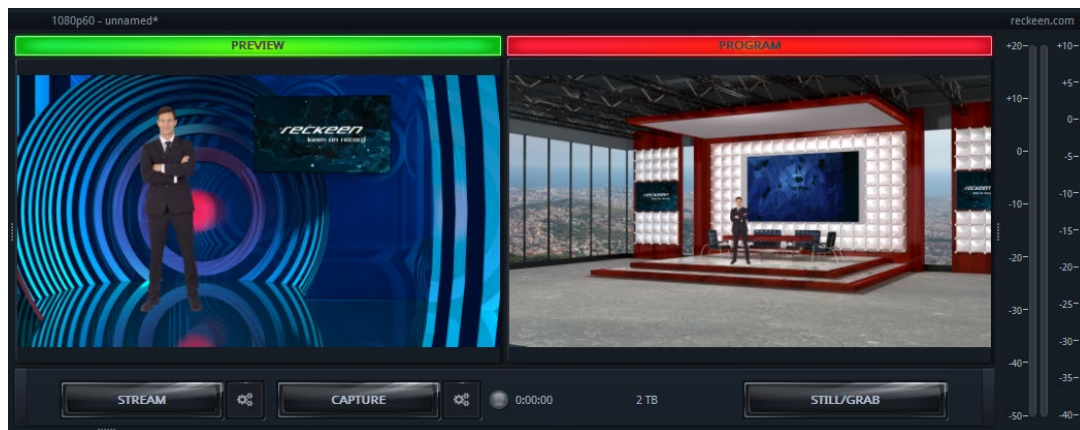
Control panel allows you to define four phases for one virtual camera **V/C** shot (Phase 1, 2, 3 and 4 previews). The current phase is marked by a highlighted stripe above the preview. Phases can be switched at any time, both when the studio is on the air, and when it is being prepared for broadcast. Clicking on a preview of one of inactive phases switches the view to that phase.

After loading to the control panel a studio's set design that has several virtual camera shots, the shots will be loaded into **V/C 1**, **V/C 2**, **V/C 3**, and **V/C 4** trays. This will correspond to images from 4 virtual cameras in the studio. Switching between the trays allows you to quickly change the virtual camera's view.

In the Reckeen LITE system, you can also load one studio into the **V/C 1** container, which is going to be on the air, and a completely different one into the **V/C 2** tray, which is going to be prepared for broadcast on the **PREVIEW** screen. The image below.



PROGRAM and PREVIEW screens for two different studios loaded into two V/C trays. The image below.



SELECTION OF SIGNAL SOURCES A, B, C ,D

Unlike Reckeen 3D in Reckeen Lite, the setting of sources A, B ,C and D is different for each camera V/C.

The fundamental part of studio configuration is a selection of a source. Usually, a studio project allows you to place there 4 input signals A, B ,C and D that are set on the mixer in an additionally opened panel.

In a studio design, the first two of them, namely A and B, are almost always images of presenters (Talents), from CAM 1 to CAM 4 sources. A keying filter is applied to these sources.

The applied key removes a uniform background (e.g. green), on which the presenter is filmed.

The third and fourth signal source – C and D may be a film or a still image. They are usually displayed on virtual screens that are a part of studio scenography. Everything depends on the project. In the picture below, you can see two images of presenters (source A and B) and studio screens, where a film (source C and D) is displayed. Picture below:



Most often the default A, B, C and D sources were defined by a studio designer, but you go to the VSM Lite Editor and create your own settings, e.g. remove a Talent or add a screen. In each studio, signals can be used in a different way. Due to this flexibility, the signals have been described in a studio configuration panel in a universal way - symbols A, B, C and D (image below).



There are four separate rows of buttons with identical descriptions for sources A, B, C and D. This enables a separate regulation of parameters for sources A, B, C and D.

The input signal for studio composition can be: a transparency (Off), a camera image (CAM_1, 2,3,4), a video file (Media 1, 2), an image/bitmap (Still 1, 2),

And so are called the buttons located in four rows below the studio previews. The button with selected source is highlighted. Changing the input source takes place immediately, so you can change it during the live broadcast.

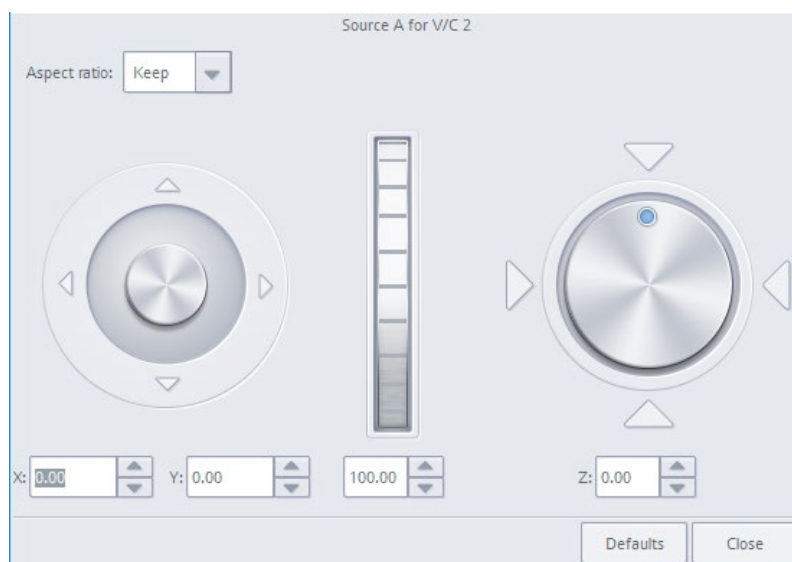
After selecting the appropriate signal sources, a figure of a presenter will be displayed against a studio scenography, and a selected video file or a still image will be shown on virtual screens. If a keying filter has not been enabled for the source with a presenter figure, you have to switch it on and set its parameters. After applying the correct keying parameters, a background against which the presenter is filmed (e.g. green) will be removed and the figure of the presenter will be visible against the background of the studio

scenography.

In order to make the figure of the presenter fit better into set design you have used, you can adjust the figure's size and position in the studio. A separate window is used for changing these parameters. The window can be opened with a button located next to the buttons used for the studio's signal sources selection. Picture below.



This window works on the same principle as the Placement window earlier described in the DSK section. The only exception is an additional function Aspect Ratio: Keep / Stretch described on the following pages of the manual. Picture below.



SELECTION OF SIGNAL SOURCES A, B, C ,D ASPECT RATIO FUNCTION: KEEP/STRETCH

With this function, you can set the aspect ratio for sources A, B, C or D, for movie files or for images.

The Keep option allows you to maintain the source's aspect ratio, while the Stretch option stretches the image to cover the whole desired area. See the following example.

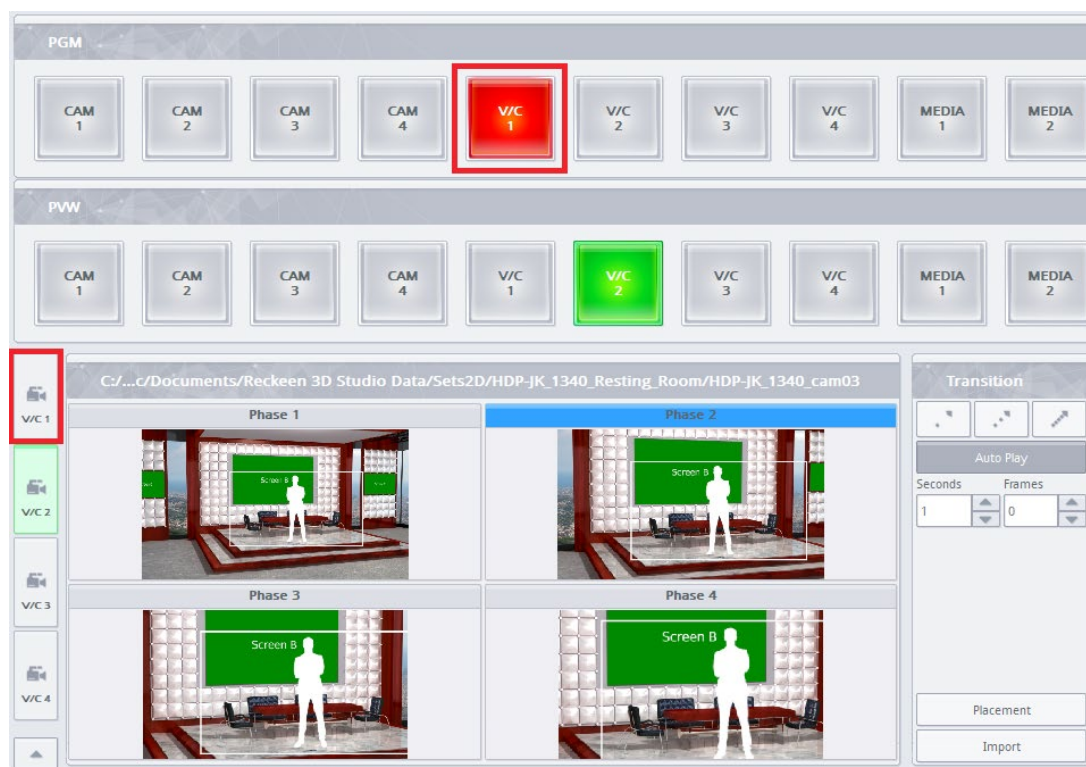
If, for example, a video file with its aspect ratio of 4:3 is placed in a studio on a display, which has an aspect ratio of 16:9, the image file proportions will be maintained and the 'lacking' space on the screen will be transparent.

If you select the Stretch option, the image of an aspect ratio of 4:3 will be stretched to 16:9 proportions, and there will be no uncovered space on the display. You have to remember that the stretched picture will not have the previous aspect ratio. Picture below.



LOADING A STUDIO FILE

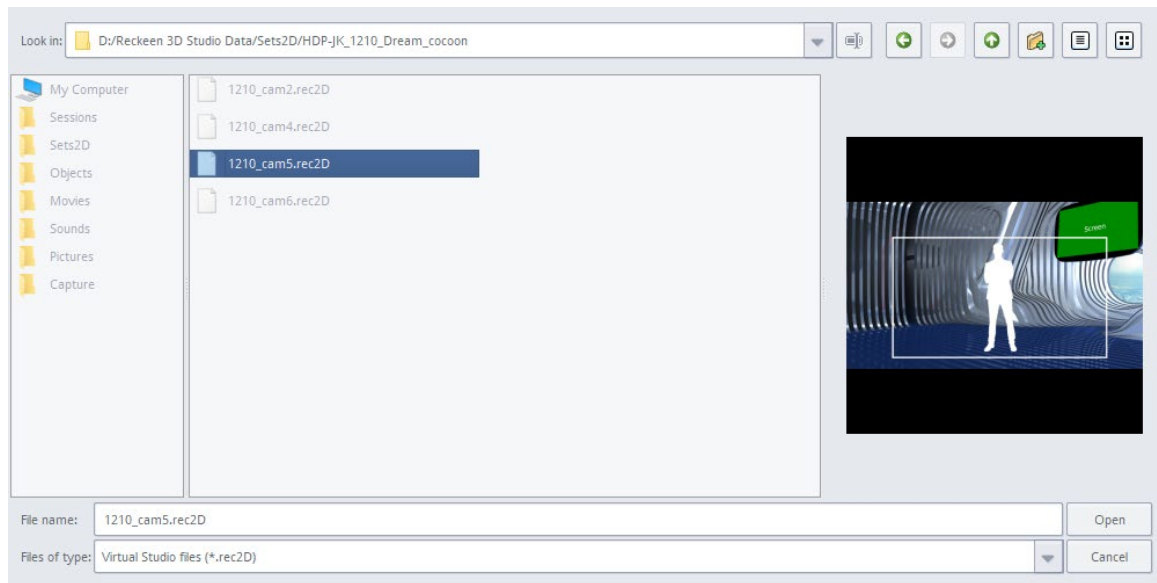
In order to load a selected studio project, choose one of the V/C trays to which a new studio is to be loaded. Press one of V/C buttons on the PVW switcher. You can also select the tray by pressing V/C button on the side bar. The selected button will lit up green. The image below:



Then, press Import button in the studio's configuration panel.

Specify a proper file with *.rec2D extension in the file selection window that opens. After clicking on a file,

its set's preview is displayed in the window on the right. Picture below



The file will be loaded into the selected V/C tray. In order to load the consecutive projects or studio shots, the action should be repeated for the subsequent studio shots, choosing a different V/C tray number.

PLEASE NOTE: For each studio's set design, you should choose sources A, B, C, D that will be used in the displayed studio.

Such loaded studios are immediately ready to be used, so if you want the studio to appear on the air, you only need to press TAKE button.

AUTOPLAY FUNCTION

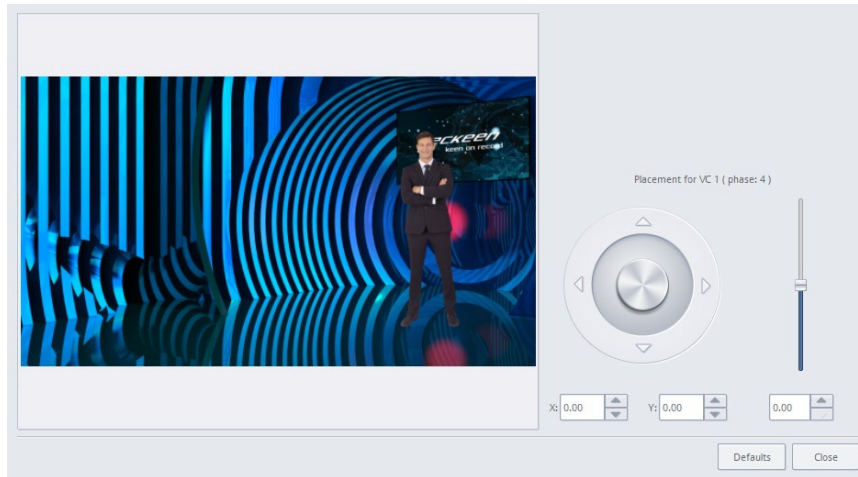


The AutoPlay feature allows you to animate the camera's PTZ (Pan, Tilt, Zoom) transition effect. If AutoPlay function is enabled, the camera's motion is smooth and animated. The time of this transition can be adjusted with up / down arrows placed on the right of the phase previews (Seconds, Frames).

If the AutoPlay button is turned off, the camera changes its position 'sharply' (without animation). For the ease of use, three default durations of transitions between phases has been defined - fast (1 second), medium (3 sec), and slow (5 s). The image below.

PLACEMENT

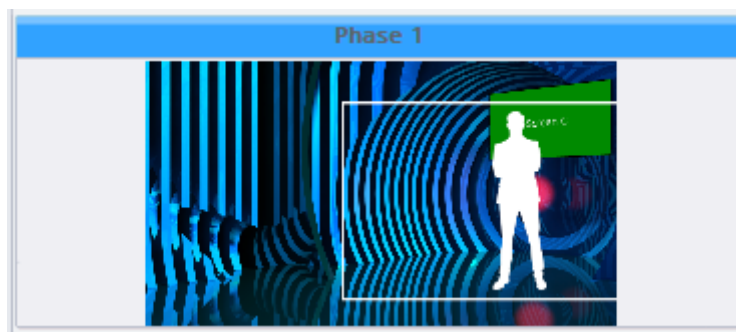
Placement button allows you to change the camera's position in a currently active phase manually, in a separate window. Controls in the window enable you to change both camera's position and its zoom. With an additional Defaults button you can restore the default settings. See the image below.



Camera settings are saved after closing the window. The program retains the settings introduced for a given V/C tray until a new shot or a new studio project is loaded.

For each newly imported studio, phase settings are defined by default - the first phase zoom is set to zero (0%) of the maximum zoom, the second phase 33%, the third 66%, and the fourth 100%.

Remember that the area of the presenter's possible movement in the studio is the Talent area - limited by a white line, as shown in the image below.



SAVE SESSION FILES

In order to keep all the studio settings (selected sources, virtual camera V/C positions and settings, and others) and be able to use them for the next production, there is a possibility to save them in a session file. To open such saved settings, you have to load an appropriate session file at the start of LITE Production module.

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VSM - Virtual Space Maker
LITE Editor

INTRODUCTION

Virtual Space Maker - a virtual set design editor is an additional module of RECKEEN LITE system, complementing its Production LITE module. It has also been prepared to operate as a stand-alone program that can be installed on any PC. With its help, you can easily set up your own virtual studio scenography. The design of a studio is carried out with the use layers placed one above the other. This way, you can make a composition of pre-prepared graphics and layers representing signals - sources A and B (Talents) and sources C and D (Screens). A Talent is a presenter or an actor in front of the camera. After saving a project prepared in this manner as rec2D file, you can use it as a ready-made virtual studio's set design, that is, load it into RECKEEN LITE system. Before you begin working with VSM Editor, on a startup screen you should choose an image system in which you are going to work in the editor. See picture section: Reckeen 3D Studio System Startup> LITE VSM Editor. Picture below.



Key features of the Virtual Space Maker editor:

- create your own virtual set designs,
- graphic file layers layout,
- edit layers: add a new layer, reorder the layers, hide existing layers or remove unwanted ones,
- changes in a layer such as zoom, changes in its position and rotation along its X, Y and Z axes,
- special .rec2D file format that can be easily loaded into the production module,
- menu available in different languages,
- various Talent views to be set: full, behind the desk, middle - showing shots of a set.
- choice of application style: white or black.

WORK AREAS OF VIRTUAL SPACE MAKER EDITOR

Virtual Space Maker's application screen can be divided into four areas. They will be described in detail in the further part of this manual. Picture below.



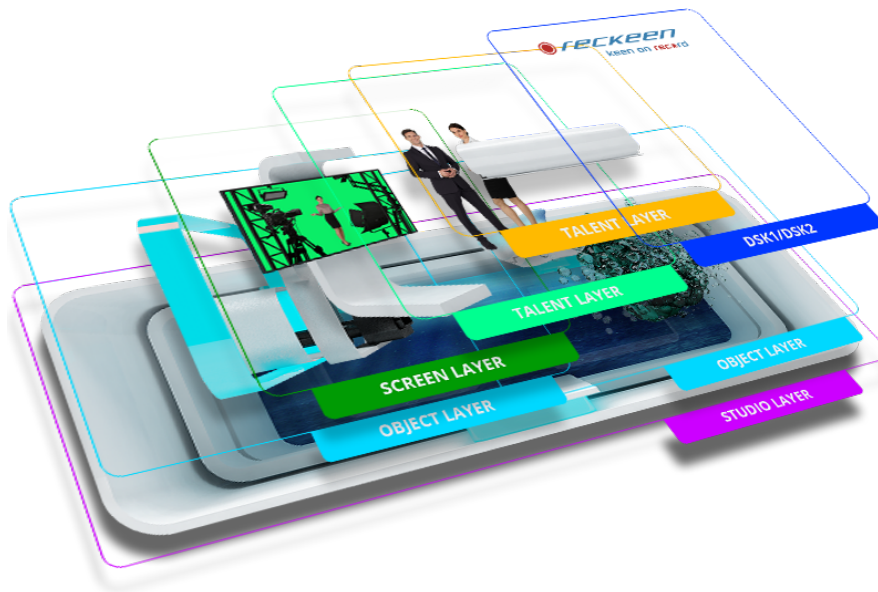
- Area 1 - Menu bar, where you have access to many of the editor's functions.
- Area 2 - Layers window - contains buttons for adding, removing and changing layers order. In addition, thumbnails representing project's individual layers are shown in this area.
- Area 3 - Control window with controls to change properties of a layer currently marked for editing.
- Area 4 - Workspace screen window for previewing the created set design. It shows ongoing changes introduced to the studio's design.

TYPES OF LAYERS

Composition of a studio consists of flat images and areas for the sources. These are the layers. They are placed one above the other, and their order 'on the stack' can be freely changed. There are four types of layers in the program:

- a Studio layer,
- an Object layer,
- sources A and B (Talents),
- sources C and D (Screens).

Picture below:



Studio layer - an image that covers entire screen - it cannot be scaled or moved. However, this layer may be partially transparent and more than one studio layer can be added.

Object layer - it is a graphic layer that can be scaled and moved. It is assumed that this layer is partially transparent, but it is not obligatory. There can also be several layers of this type.

Talent layer - it is an area for the 'source signal' from a camera. Such a layer can be scaled or moved.

Screen layer - a place where graphic files or video files can be displayed. This layer also can be scaled or moved.

Talent layers and Screen layers are represented differently in the editor, but the difference between them is arbitrary - they are identical on a technical level. It is even more evident later on, in the LITE Production module, where they can have any kind of input signal assigned, i.e. camera image, video, static image, etc.

Below, you can see the image of a whole studio with all its layers.



STUDIO LAYER

This type of layer is used for placing graphic files representing the studio's interior (background). Picture below.



Graphics loaded into studio layers are scaled so that they fill an entire Screen. Graphics with a resolution lower than the Screen's resolution will be stretched to full Screen, which may cause deterioration of their quality. It is therefore recommended to use files in PNG, JPG, JPEG, or BMP formats with resolution of 1920x1080 or 2880x1620, that is with image aspect ratio of 16:9.

You cannot perform any transformations on Studio layers, therefore, when you select such a layer to be edited, its transformation controls are not active (they are dimmed) and a padlock symbol appears next to the layer's thumbnail. PNG files that you place on a studio layer may contain transparency. This allows you to create a background by combining several graphic files, you just have to note that the files should have the same resolution. If you load a PNG file with no transparency or a JPG, JPEG, or BMP file on a studio layer, it will completely cover all the layers placed below the layer containing such file. The order of studio layers can be freely changed using arrows located at the top of Layers area. On the image below, a file on a studio layer contains transparency in the areas of studio's windows (areas with a grid representing transparency on the thumbnail).

NOTE: if you want to avoid automatic stretching of the file you are planning to put as a studio layer (e.g. when you want to use some part of it or scale it appropriately), then you should load it as an object layer.

On the image below, you can see a view with an additional loaded layer of a city panorama outside studio windows. When you click an object layer's thumbnail in the layers window, the size and location of the image is indicated with a white frame.



OBJECT LAYER

You can complete the studio with object layers. These can be any objects of a studio decor: a desk, a lamp, etc. You can also place logos anywhere in the studio, e.g. a sports club logo on the studio's floor. This layer can be scaled, moved, and rotated by any angle. It is assumed that this layer is partially transparent, but it is not obligatory. There can be also several layers of this type. However, if you want to insert a TV station's logo that is supposed to be in the same place on the Screen all the time on the air, regardless of the virtual camera's movements, you should not put it on your set design. Instead, use DSK function in LITE Production module at the production stage and load your logo as DSK. On the image below, you can see the object layers with two different objects loaded.



SOURCES A AND B -TALENTS

A layer representing signal sources - sources A and B (Talents). This layer can be placed anywhere on the Screen and can be resized freely. It represents a figure of a presenter - the Talent layer is a 'place for the source signal' from the camera. For the ease of use, there are several Talent thumbnails depicting different shots of the set. You choose a type from Source Type drop-down list. See the image below.



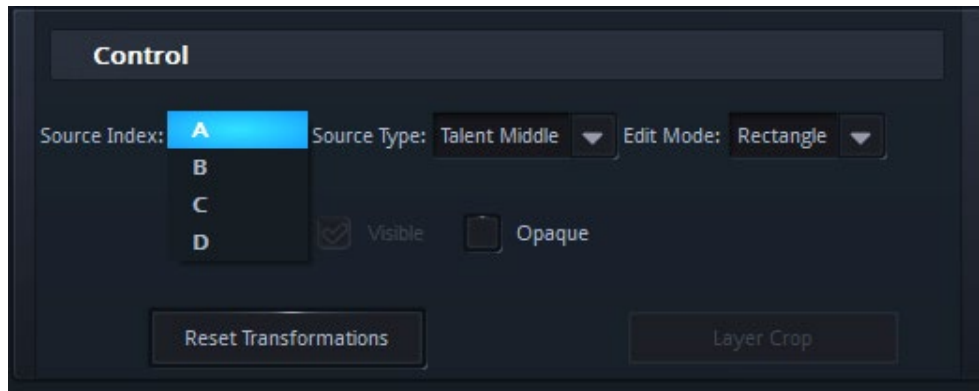
Talent and Screen layers are represented differently in the editor, but the difference between them is arbitrary - they are identical on a technical level. It is even more evident later on, in the LITE Production module, where they can have any kind of input signal assigned, i.e. camera image, video, static image, etc.

It is possible to place several Talent layers in your studio's set design. The maximum number of layers with sources (Talent + Screen) in the set design is 8.

The maximum number of sources in the set is 4 and they are marked with letters A, B, C and D. It means that if you put more than 4 sources in the set, e.g. 1 talent and 5 screens, then on some screens the same content will be displayed (they will have the same source, e.g. A). The image below.



By default, A and B sources are for the Talents and C and D are for the Screens, but you have always a possibility to change the source. Image below: selecting a signal source from Source Index drop-down list.



SOURCES C AND D (SCREENS)

A layer representing signal sources - sources C and D (Screens). It can be placed anywhere and freely scaled. The layer represents a place in the studio where additional content can be displayed (video material, panels, etc.), i.e. virtual Screens.

The Screen layer can be scaled and moved. Image below shows such a Screen layer.



Example:

The simplest set design may consist of three layers (the program operates on two-dimensional layers, placed one above the other). The first one is a background layer (Studio layer). You can place any image depicting an interior of a studio (it can be, for example, a photo) on this layer. The image will be scaled to fill an entire video frame (in the pre-defined resolution).

Subsequently, you should add layers representing signal sources - source A (Talent) and source C (Screen). Both can be placed anywhere in the studio and freely scaled. The first source represents a form of a presenter, while the second one - a place in the studio where additional content can be displayed (video material, panels, etc.), i.e. a virtual Screen.

A Talent layer should be placed on the very top, so that the presenter would not be accidentally covered. Unless, of course, you want to achieve such effect intentionally, when the presenter is, for example, partly obscured by a desk. In such case, a layer with a desk object should be placed in front of the Talent layer.

The program, however, allows you to change the order of already added layers at any time.

The image below shows a set design created with the use of three layers. A photo is loaded to the studio layer.



At this point, the studio is ready to be used in LITE Production module. As you can see, Virtual Space Maker editor is a tool that is very easy to use and which allows you to create a new virtual studio set design with layers in just a few moments.

In addition, the studio can be completed with an object layer, where you can place any piece of interior design, e.g. a lamp. This layer can be placed wherever you want on the screen by moving and scaling it. In the image below, 3 hanging lamps have been added to the studio



Example:

If you have a set created with two layers - e.g. Screen (source C) and presenter (Talent - source A), then the presenter will be moving against the background of what is currently being displayed on the Screen. If you choose a video with an image of a street filmed with a stationary camera to be displayed on the Screen, it will be a background for your presenter. With that, you can achieve an effect that the presenter



is visible, for example, on a busy street in the middle of a city.

Such created composition can be now saved and so it becomes immediately available in the production module.

Naturally, along with RECKEEN LITE system, you get a package of ready-made set designs that can be used in a program broadcast. You can edit any of these set designs supplied in the package using Virtual Space Maker editor module.

In the case of ready-made sets, you have, among others, the following editing options:

- hiding / revealing selected layers - an easiest way to get a different version of the same studio is to, for example, hide a table behind which a presenter should sit in the studio, creating an open studio set design,
- inserting additional graphics, e.g. placing additional objects in the studio.

Due to the fact that a structure of ready-made sets can be very complex (multi-layered), it is easy to accidentally 'break' such composition, e.g. by removing one of the layers. To protect against this kind of error, the provided set design files are protected against modification. However, you can always save such set under a different name, marking a new file as unprotected, and then modify it as you like.

RECKEEN LITE system is delivered with a package of ready-made set designs, that is, virtual studio scenographies. In addition, the system includes a rich library of objects used in these sets. The objects are available as PNG files with a transparency layer. Each of these objects can be used also in other sets.

With the Virtual Space Maker editor, every user can create their own studio set design or make modifications to an existing one.

There is no difference between the set designs from LITE Production module perspective, regardless of how they were created. Note that some functions, such as assigning signals (media, camera, image) to the sources, only takes place in LITE Production module, not in the VSM editor.

In the VSM editor, a new studio consists of flat layers, previously prepared in, e.g. Photoshop, 3ds MAX or GIMP. No operations can be performed on the original set design (provided in the package), as its file

is protected. To be able to modify it, you need to create a copy of the studio file, change its name and operate on a new file. However, for Reckeen LITE program, there is no difference between the previous studio and its modified copy.

VIRTUALSPACEMAKERSOFTWARE – HARDWARE REQUIREMENTS

Virtual Space Maker - apart from being an element of Reckeen LITE virtual studio software, this set design editor has also its stand-alone version. This software can be installed on your computer, just like any other standard software. But before installing, make sure that your computer meets the minimum requirements.

- CPU: i3 or faster
- Memory: 4GB RAM
- Graphics Card: GPU with DirectX 11 drivers
- Operating System: Windows 7 (64-bit) SP1 with 'Platform Update' , or higher
- Monitor resolution of 1680 x 1050 or higher
- CPU: the x64 processor must support the AVX2 instruction, i.e.: https://en.wikipedia.org/wiki/Advanced_Vector_Extensions#Advanced_Vector_Extensions_2 .List with support for such a CPU :
 - Intel
 - Haswell processor, Q2 2013
 - Haswell E processor, Q3 2014
 - Broadwell processor, Q4 2014
 - Broadwell E processor, Q3 2016
 - Skylake processor, Q3 2015
 - Kaby Lake processor, Q3 2016(ULV mobile)/Q1 2017(desktop/mobile)
 - Coffee Lake processor, Q4 2017
 - Cannonlake processor, 2018
 - Cascade Lake processor, 2018
 - Ice Lake processor, 2018
 - AMD
 - Excavator processor, Q2 2015
 - Zen processor, Q1 2017

SOFTWARE INSTALLATION

After loading the software on your computer, double click Virtual Space Maker Software icon on your desktop. The program will launch in English language. To change the language, click Configurations on the top bar and then Language on the drop-down menu that appears. Select the language afterwards.

Before opening the start screen, make sure that your computer monitor has its resolution set to 1680x1050 or higher.

VSM EDITOR'S WORK AREAS

After opening the VSM editor, you can see its start screen. It can be divided into 4 areas, as shown in the image below.



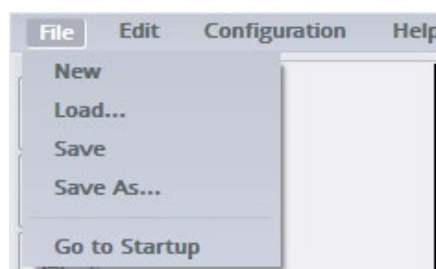
- Area 1 - Menu bar.
- Area 2 - Layers window, where you can see inserted layers and their order. You can also change their order or hide their visibility there.
- Area 3 - Control window is a part, where you can find editing tools: zoom, rotation and other alterations in the layers of your set design.
- Area 4 - Workspace screen window, which allows you to see all the changes you introduce to the set design. The view on the work screen retains all the proportions and shows you how your set design will look like on the Production module screen.

MENU BAR

Menu bar is located at the top of the screen. You can find four main options there: [File](#), [Edit](#), [Configuration](#) and [Help](#).

The table below shows the following sub-options available after clicking on a main option.

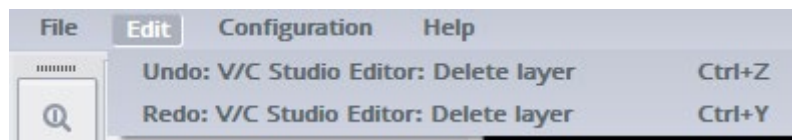
MENU BAR – FILE



- New - creates a new file.
- Load - loads an existing file.
- Save - saves the changes made to the current project.
- Save as - saves the project file under a different name (There is a function preventing unintentional overwriting of a file).
- Go to Startup - exits the editor.

MENU BAR – EDIT

Picture below.



- Undo - deletes the last introduced change. Keyboard shortcut: [Ctrl + Z](#).
- Redo - reverses the undo command. Keyboard shortcut: [Ctrl + Y](#).

MENU BAR – CONFIGURATION

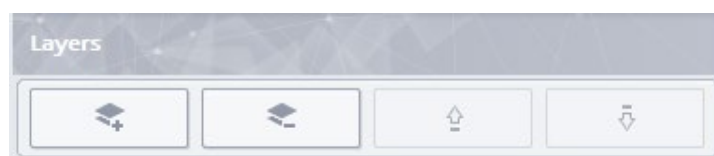
- Language - allows you to choose the application's language.
- Styles - changes the application's appearance: black or white version.

MENU BAR – HELP

- Help - About the program - User license agreement (EULA)
- QR Code- Here, you can scan the [QR code](#) to open the [support Reckeen website](#).

LAYERS WINDOW

You can see Layers window on the right side of the screen - area 2. This window renders accessible the following 4 functions. Function icons are located at the top of the window. Picture below.

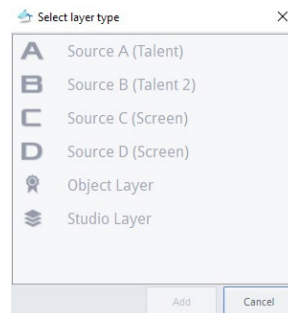


Starting from the left:

- Create: Add a layer
- Delete: Delete the existing layer

- Move up: Move the layer up
- Move down: Move the layer down

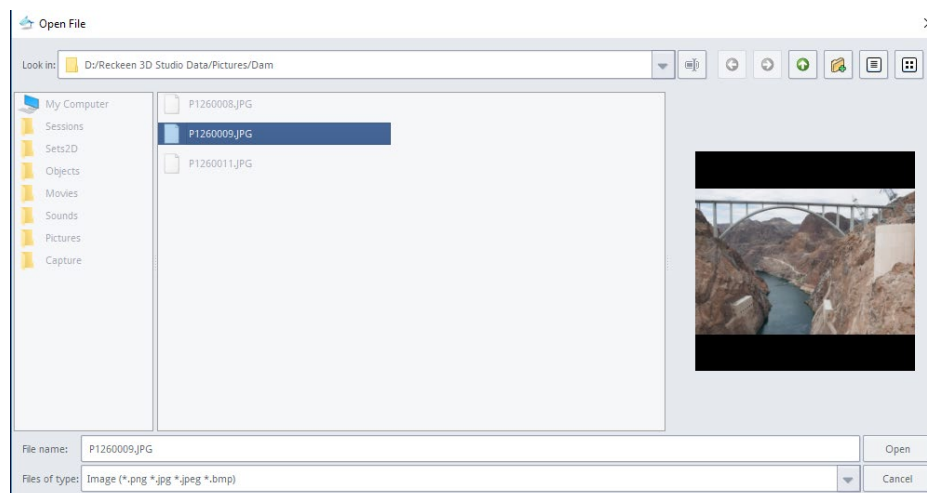
In order to start editing, click the first icon on the left: Add a layer. A window will open: Select layer type. See the image below.



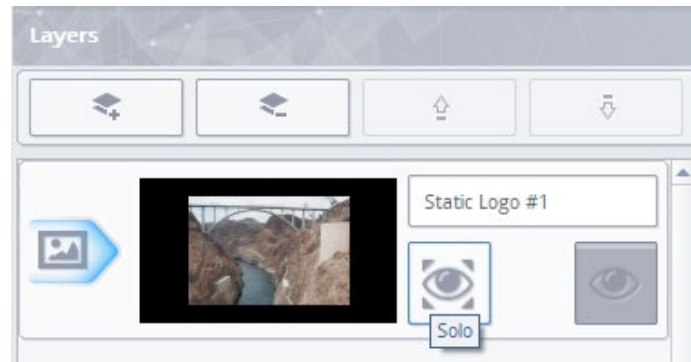
In this window, you can find four different types of layers that can be added by clicking on a layer:

- Sources A and B (Talents),
- Sources C and D (Screens),
- Object layer,
- Studio layer.

After marking **Studio Layer**, click **Add** button. You can now browse graphic files on your hard drive. A single click on a file will open the file's preview. To load a graphic file, press **Open** or double click on the file name. The image below.



After loading the image file, it appears in the workspace, while its thumbnail shows up in the **Layers** window. There are two icons on the right side of the image's thumbnail: **Visible** and **Solo**. Picture below.



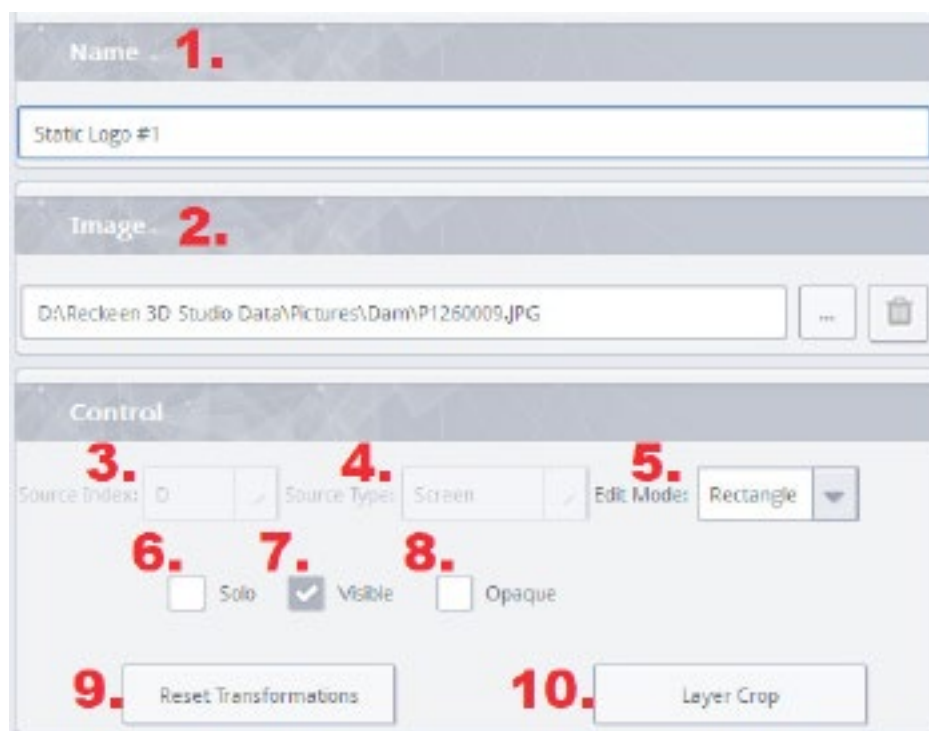
Their functions are described below:

Icon: Visible - by default, the visibility of a given layer is enabled, and you can disable visibility of a given layer in the studio by clicking on this icon. This way, you can, for example, turn off the visibility of a desk or other object in the studio, without removing it from the list.

Icon: Solo - this icon is disabled by default. Click on Solo icon to hide all the other layers. Only the selected layer will be visible in the workspace. All the others will disappear. This feature is especially useful if the studio contains a lot of objects and some layers' visibility is hindered.

CONTROL WINDOW

There are various options of layers' editing available in the control window in the lower left corner of the screen. The image below. Options available for an object layer - there is an image loaded from the disk on the layer.



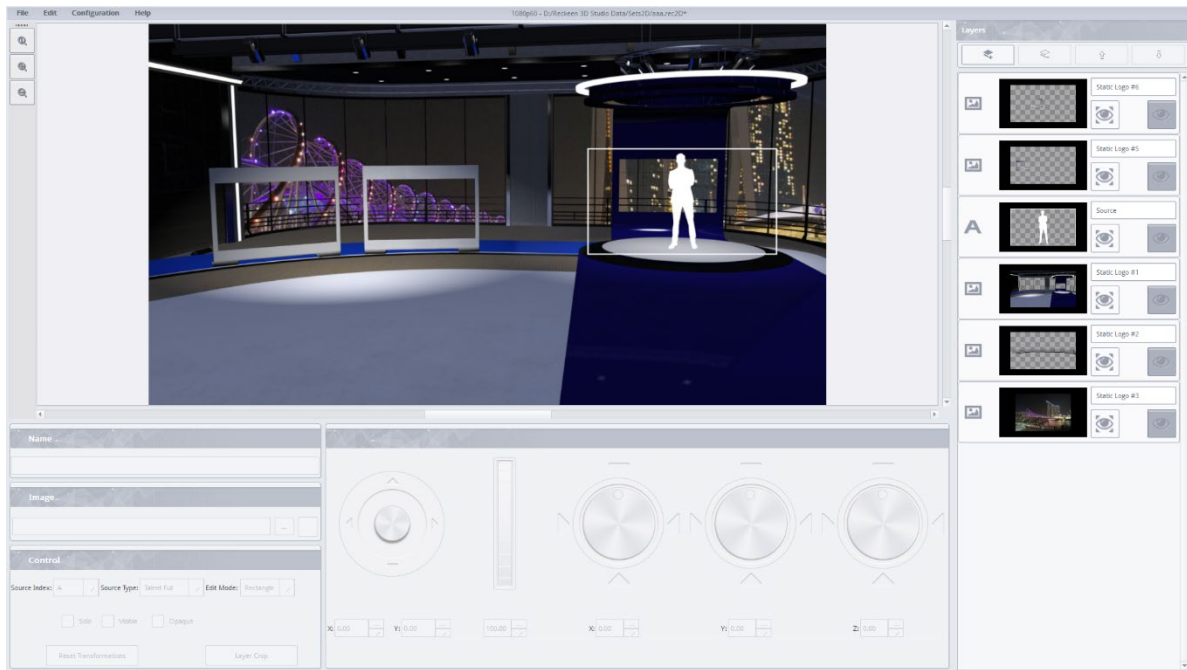
Below, you can see a description of individual buttons' operation.

1. Name panel - a place where you define the layer. A description 'Source' appears for the Talent and the Screen layers, while a 'Static logo' is shown for the Studio layer and for the Object layer, just as in the image above.
2. Image panel - a path on the disk to a selected file for Studio layer or for the Object layer. Click on an icon with 3 dots to choose a different graphic file from the disk and load a different Image in its place. In order to delete an image from a layer, click on an icon with bin mark.
3. Source Index - select a source for the Screen or the Talent layer from a drop-down list: A, B, C and D.
4. Source Type selection: from a drop down list: Talent Full, Talent Desk, Talent Middle, Screen and Other.
5. Layer's Edit Mode: available modes are: Rectangle and Points.
 - Rectangle - in this mode, you can change shape, size and position of a layer with the use of icons set at the bottom of the Screen (joystick and knobs). A detailed description in the further part of the manual.
 - Points - this edit mode is available when you choose Talent, Screen or Object layer. It allows you to perform various kinds of transformations on a selected layer. You can move it anywhere on the Screen by hooking the cursor on a point located in the corner. You can change positions of the points to be able to freely modify the layer's shape. A detailed description in the further part of the manual.
6. Solo - by default this option is disabled. By enabling it, you hide all the other layers except the selected one.
7. Visible - this option is enabled by default. Disabling this option hides the selected layer.
8. Opaque - opacity. This option is available for the Talent, Screen and Object layer. It is enabled by default for the Screen layer, while for the Talent and Object layer, it is disabled by default. By enabling this option a transparent area on the selected layer changes to black.
9. Reset Transformations - you can restore the selected layer to its default initial size and shape by clicking on this icon. All operations performed on this layer will be deleted.
10. Crop Layer - this function allows you to crop the loaded image. You can only use it on the Object layer. Description further in the text.

CONTROL WINDOW – EDIT MODE : RECTANGLE AND POINTS

The set design editor provides you with various options of editing a single layer. Let's examine an example.

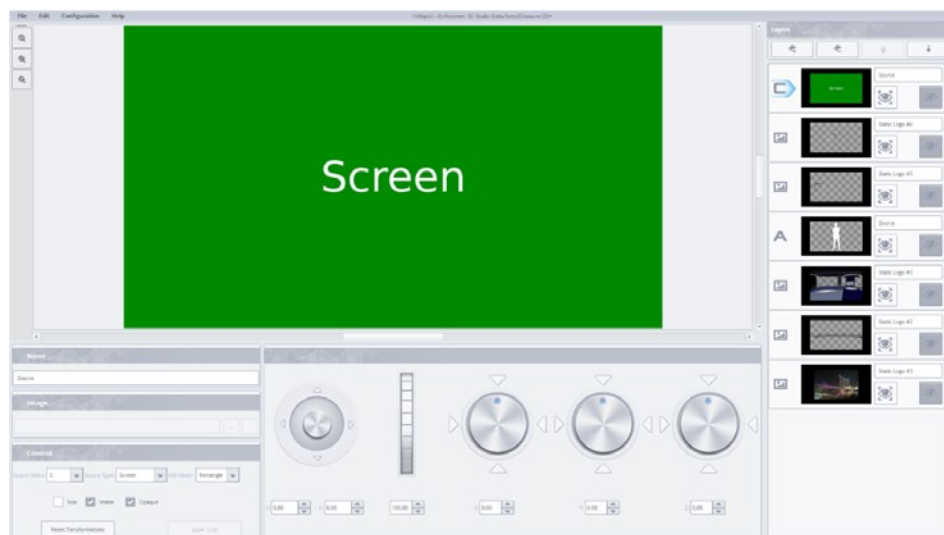
Example: The goal is to insert into the set design a layer with a screen so that it fitted into TV housing. Image below: a studio with two TVs without screens.



Keep in mind that, when you add another layer, it will be placed in front of those previously added in the studio, i.e. the lowest layer is the furthest layer from the camera's perspective. Therefore, most often the Talent layer is added at the very end (it will be at the very top), so that nothing obscures the form of a presenter.

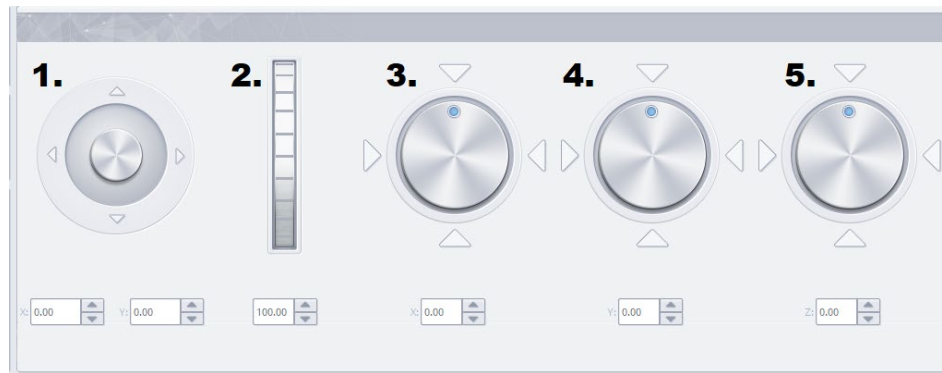
Let's use Rectangle mode to load the first Screen layer into the TV housing, and Points mode for the second TV to show you the difference between them.

Load the Screen layer. As in the image below:



Note that, after loading, the **Screen** layer fills an entire screen area, covering all the other layers.

Let's use **Rectangle** edit mode. This edit mode is enabled by default. There is a control panel for this mode at the bottom, it comprises of five elements: a **joystick**, a **vertical controller** and **three rotary knobs**.



1. Joystick - changing the position of a selected element / layer. The position can be also changed by 'grabbing' the element with the cursor and dragging it with the mouse.
2. Vertical controller - resizing the element, scaling.
3. Rotary knob: X plane - rotation of the element in the X plane.
4. Rotary knob: Y plane - rotation of the element in the Y plane.
5. Rotary knob: Z plane - rotation of the element in the Z plane.

There are two ways to operate the vertical controller:

1. Click on any place on the controller's knob and move it up or down
2. Use the arrows located next to the numerical value field for precise movement of the controller's knob.

In the case of rotary knobs, there are the following ways to operate them:

1. Click on any place on the knob and turn it to the left or to the right.
2. Click on one of the four triangles around the knob to turn the knob setting the knob's dot exactly at the point indicated by an arrow. It will be a rotation of exactly 90 degrees or of a multiple of this value.
3. Use the arrows located next to the numerical value field for precise movement of the knob.

Use the vertical controller to reduce the size of the [Screen](#) layer's green rectangle. Image below.

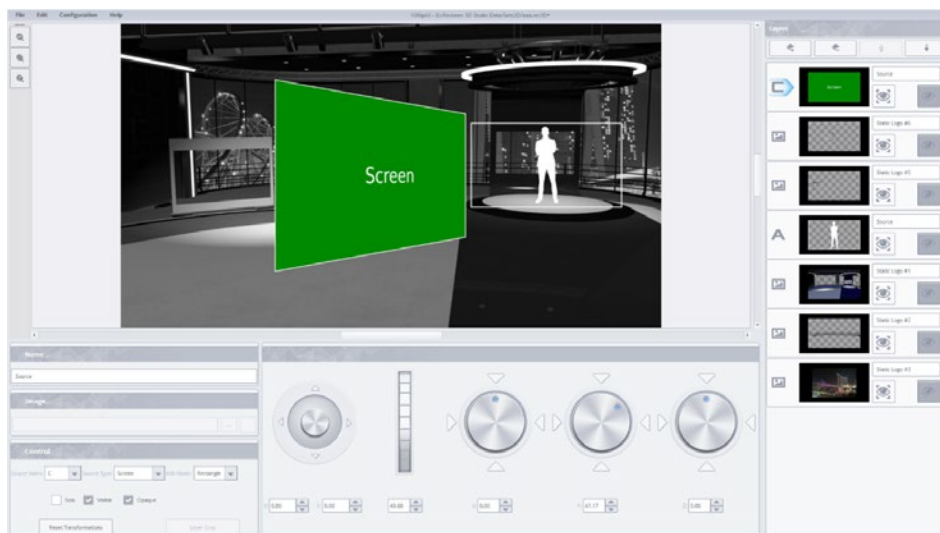


Since immediately after loading, the **Screen** layer fills up an entire area, the controller's value is **100 (in%)**. After reducing the layer's size, the parameter's value also decreases.

The layer can be rotated along its X axis with the use of the first rotary knob. Click on any place on the knob and rotate it. Image below.



The **Screen** layer can be also rotated along its Y axis. Use the second rotary knob for that purpose. Image below.



You can also rotate the layer along its Z axis. Use the last rotary knob on the right side for that purpose. Image below.

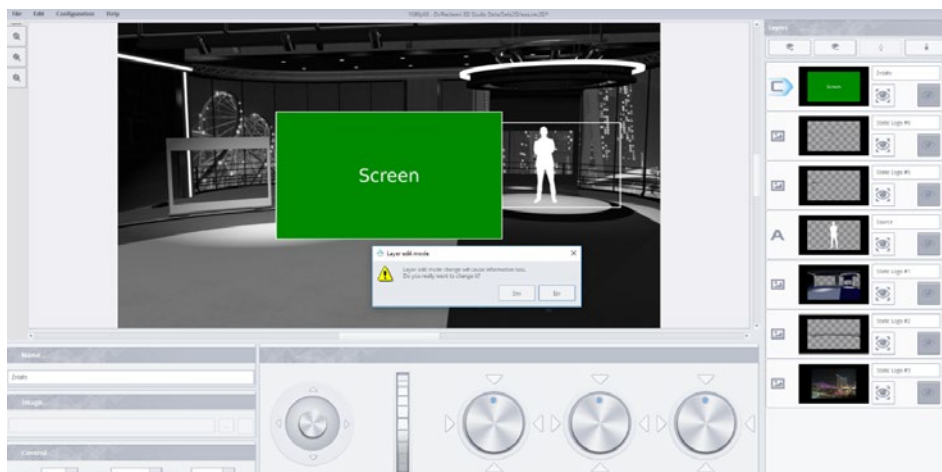




Use the vertical controller to get the appropriate size of the **Screen** layer. Then use all the rotary knobs to set the correct position. At the end, the goal has been achieved: green **Screen** is correctly placed inside the TV housing.

You can achieve the same effect, but much faster, by using the edit mode: **Points**.

Just as before, after loading the **Screen** layer, scale it as so that it doesn't cover an entire area. Use the vertical controller to reduce the size of the **Screen** layer's green rectangle. After resizing, activate the **Points** mode. When the program warns you with a message, select **YES** option. See the image below.

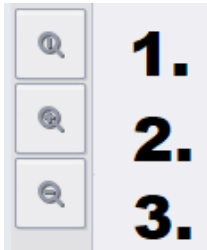


Points - this edit mode allows you to perform various types of transformations on the selected layer.

After switching to this mode, square points will show up in the corners of the green **Screen** layer. When you hook the cursor on the corner point (the point's color will change to red), you will be able to move it to any place. By changing positions of the points, you can freely modify the shape and swiftly adjust the **Screen** to the TV's housing. Just change the positions of the 4 points.

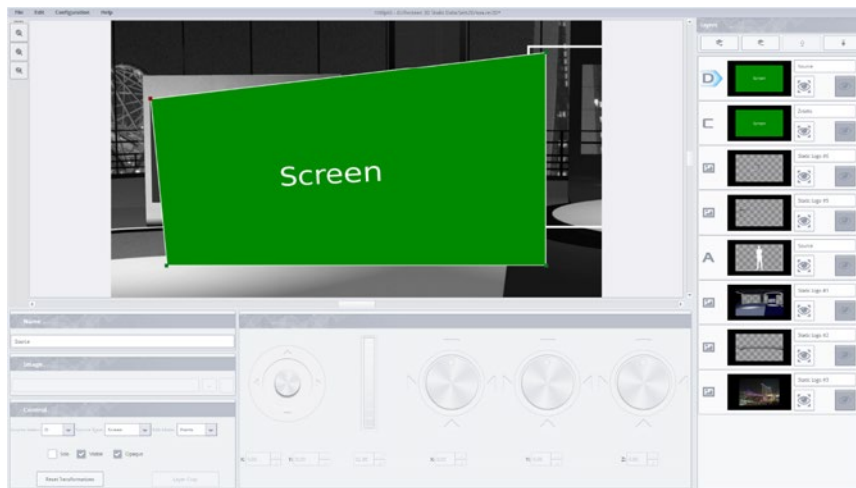
To facilitate the task, use the icons: **Zoom Out**, **Zoom In** and **Zoom 1:1**.

See the image below.

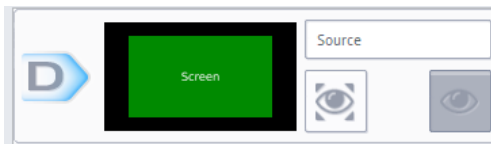


1. Zoom 1:1 icon - deletes all zoom changes made.
2. Zoom In icon - enlarges the image - for example, if you want to precisely set the points in the Points edit mode, you can enlarge the area. After adjusting the points, change the view back to 1:1 by clicking Zoom 1:1 icon.
3. Zoom Out icon - reduces the image's view.

The image below. Edit mode: Points. Setting the points. Image enlarged with Zoom In.



If there are many layers in your project, remember to mark the layer's thumbnail before introducing the changes. It will allow you to click with the mouse only on the selected layer.



After selection, a blue border in the shape of an arrow will appear around a letter **D**. The image below.

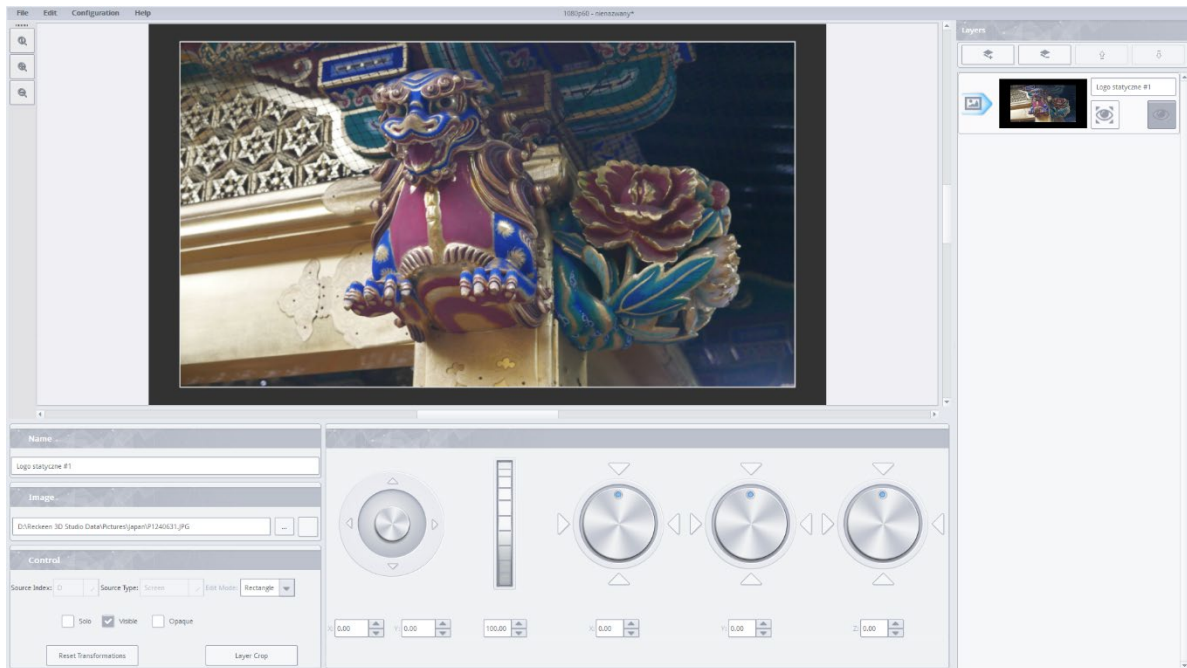
After this editing, there are two green **Screens** inserted into TV housings in the studio. See the image below.



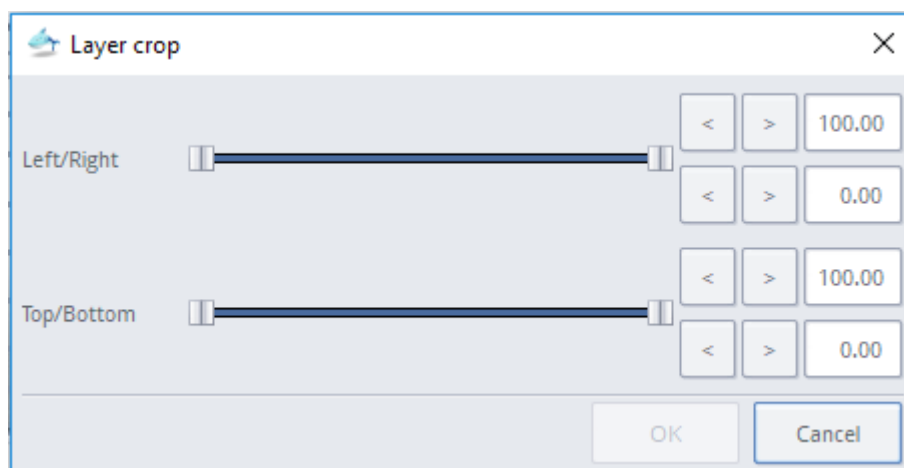
You can edit the **Talent** and **Object** layers in the same way as the **Screen** layer.

CONTROL WINDOW - LAYER CROP FUNCTION

This function allows you to crop the loaded image, but you can only use it with the [Object](#) layer. Let's examine an example. In the image below, you can see an image loaded into Virtual Space Maker editor. Only a fragment with a dragon is needed from this image. You enable the crop function by clicking [Layer Crop button](#). See the window that appears in the image below:



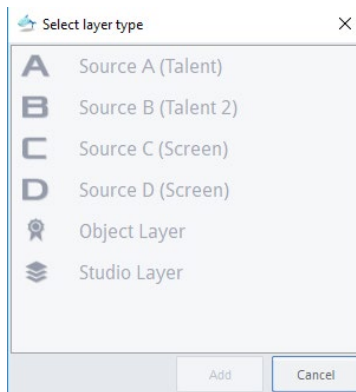
Now, change the image borders using the sliders - top and bottom, left and right. This way you can limit the image area to the desired fragment. Picture below.



The [Object](#) layer's image obtained in this manner can be further adjusted to your needs by using other functions, such as enlarging or using the [Points](#) mode.

CONTROL WINDOW - TALENT LAYER

The **Talent** layer (source A or B) is the last layer to be inserted into the set design. Normally, one or two **Talent** layers are used in the project. Picture beside.

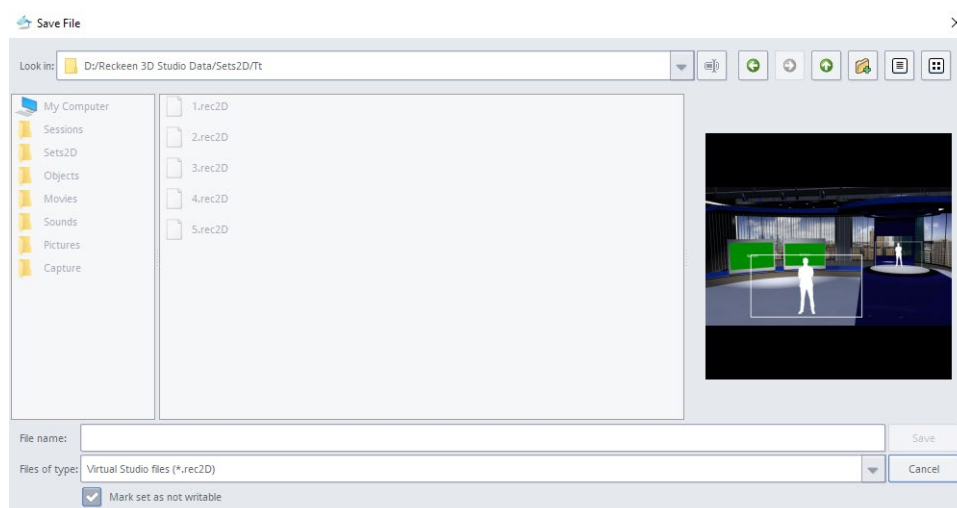


After loading the **Talent** layer into the set design, a white frame appears surrounding this layer. This white frame indicates the size and location of the camera image in the studio's set design. Picture below.

When the **Talent** layer is loaded, you can properly adjust its size and location to a desired position.



At the end, save your set design on the disk by clicking: **File > Save as**. At this point, you can enable mark set as not writable option at the bottom left of the window to protect your set design from any changes made to this file, e.g. overwriting it.



When the set is saved on the disk, you can close the editor. Now, if you have Reckeen LITE virtual studio running, you can load your set design into the LITE Production module and make a live show.

Good luck!

QUESTIONS & ANSWERS

Question:

CAN I USE A READY-MADE SET DESIGN PROVIDED WITH RECKEEN LITE SYSTEM AND INTRODUCE SOME CHANGES TO IT?

Solution

Yes, it is possible. After loading a scenography to the editor, you just have to save the file under a different name. Afterwards, in such scenography you can, for example, insert additional studio equipment using an object layer or a .png file with transparency (alpha channel).

Question:

WHERE CAN I GET .PNG OBJECT FILES WITH A TRANSPARENT BACKGROUND?

Solution

There is a rich library of such files in the Reckeen system. These kind of files can be created with, for example, GIMP program. You can also download ready-made files from the Internet using a search engine. When searching for such image, select Search Tools color: transparent. These are the files that have a characteristic checkered background representing an alpha channel or transparency.

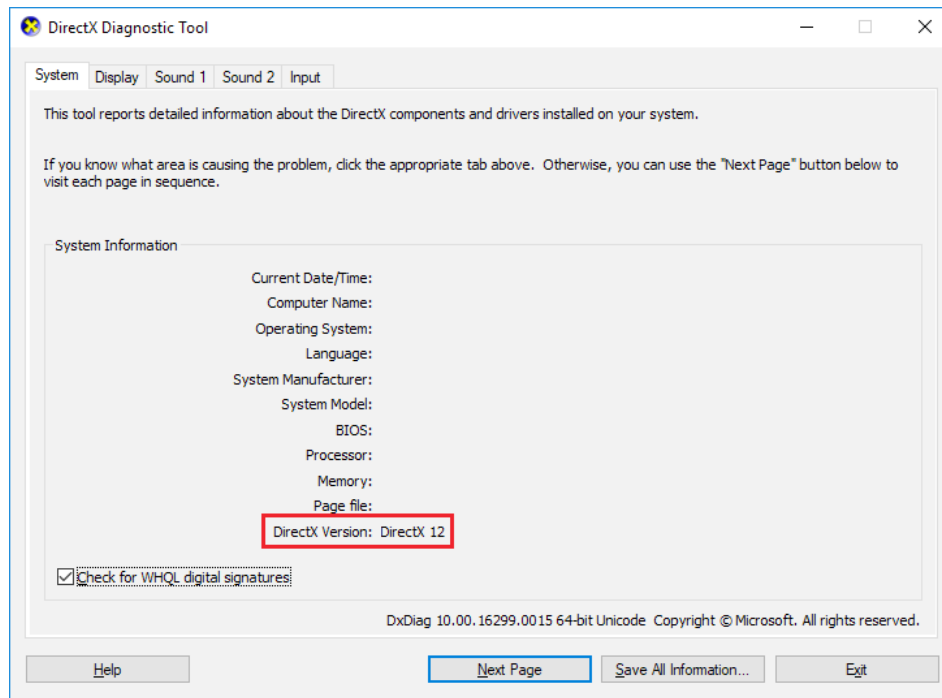
Question:

HOW TO MAKE SURE MY GRAPHICS CARD IS COMPATIBLE WITH DIRECTX 11?

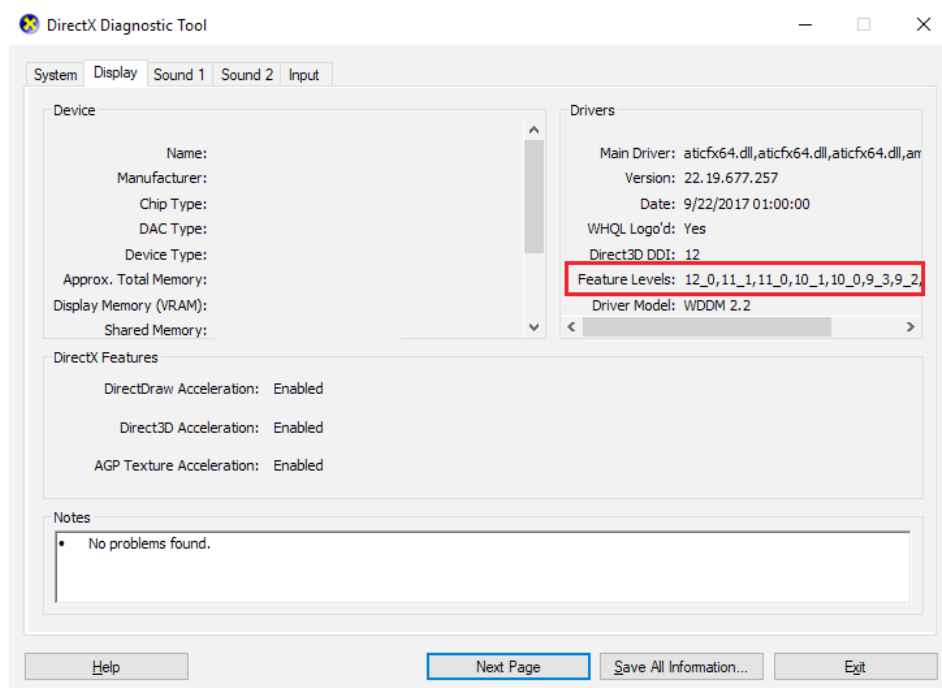
Solution

First of all, you can check on the seller's website whether your graphics card is compatible with DirectX 11.

You can also open DirectX diagnostics tool to help you check, if your computer meets the minimum requirements. To start the DirectX diagnostic tool, click Window's Start button and type 'dxdiag' in the search box, and then press ENTER. Picture below:



If you click a Display tab ,you can see what drivers your computer supports. Picture Below (26 DIRECT X)





F.A.Q

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Here, you will find descriptions of the problems you may encounter when working with the Reckeen system.

If you have any questions - search the relevant section for a description of a problem and a solution for it. If you cannot find the information you are looking for, please contact your local distributor.

Question:

Unexpected disruptions in the stable operation of the Reckeen system

Solution

Make sure that all the devices connected to the Reckeen system (cameras, external audio mixer, PC , etc.) and the system itself are powered with the voltage of the same phase. The easiest way to verify this is to connect all the devices to a single power strip in accordance with the grounding principles.

Question:

Windows system wants to update itself or displays a message referring to inability to start the system or a message about invalid graphics card drivers

Solution

For the Reckeen system, Windows updates are disabled. You should not change this allowing the updates or Windows system upgrade , as this may cause instability of the system or even inability to start the Reckeen application. This also applies to updating your graphics card drivers. If you update Windows, you have to restore it to the previous version.

Question:

Can I install antivirus software?

Solution

In the event of the need to use antivirus software, it shall be installed, the computer shall be scanned for viruses, and then the software shall be uninstalled. This is to avoid the uncontrolled incorporation of this software during live production and unstable system operation.



TECHNICAL
SPECIFICATION

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Video Input

Reckeen SDI Virtual Studio System

- **SDI Video Input**
 - 2 x SDI – 3G/HD/SD auto switching
- **HDMI**
 - 2 x HDMI 1.4 type A connector with support for 1080p60 one up to 4k 30p*

Reckeen HDMI Virtual Studio System

- **HDMI**
 - 4 x HDMI 1.4 type A connector with support for 1080p60 two-up to 4k 30p*

Video Output

Reckeen SDI Virtual Studio System

- **SDI Video Output**
 - 2 x SDI – 3G/HD
- **HDMI**
 - 2 x HDMI 1.4 type A connector with support for 1080p60 one up to 4k 30p*

Reckeen HDMI Virtual Studio System

- **HDMI**
 - 2 x HDMI 1.4 type A connector with support for 1080p60 one up to 4k 30p*

Monitor Output

(the number and type of outputs depends on the current version of the graphics card)

- 2x DP output for monitor
- 2x HDMI output for monitor
- 1x DVI-D output for monitor

I/O Port

- **Tally Output**
 - TL – DB9 – 4 channels

- **Reckeen External Keyboard port**

- RS – DB9 – RS 232

- **Reckeen External Audio port**

- LAN – Audio Link

- **Ethernet**

- Gigabit Ethernet LAN

- **PC/2**

- PC keyboard

- **USB**

- 2 x USB 3.0 (front panel)
- 4 x USB 3.0 (back panel)
- 1 x USB 3.1 (back panel)

Audio input

- **Digital**

- embedded stereo on each SDI and HDMI

- **Analog**

- 2 x XLR two channels – professional balanced analogue audio stereo differential input (-10dBV, or 4dBu)
- 2 x Jack 6,3mm two channels – professional balanced analogue audio stereo differential input (-10dBV, or 4dBu)
- 1 x MIC Jack 6,3mm – two types of microphones – dynamic and condenser with + 48V phantom

Audio output

- **Digital**

- embedded stereo on each SDI and HDMI

- **Analog**

- 2 x XLR two channels – professional balanced analogue audio stereo differential output (-10dBV, or 4dBu)
- 2 x Jack 6,3mm two channels – professional balanced analogue audio stereo differential output (-10dBV, or 4dBu)
- 1 x Jack 6,3mm – stereo Headphone output

Video formats

Reckeen SDI Virtual Studio System

- **Input**
 - **2 x HDMI v1.4, 2x SDI***
 - 2160p 30/29,97/25 on one HDMI
 - 1080p 60/59.94/50/30/29.97/25
 - 1080i 60/59.94/50
 - 720p 60/59.94/50
 - **PAL, NTSC**
- **Output**
 - **2 x HDMI v1.4, 2x SDI**
 - 2160p 30/29,97/25 on one HDMI*
 - 1080p 60/59.94/50/30/29.97/25
 - 1080i 60/59.94/50
 - 720p 60/59.94/50

Reckeen HDMI Virtual Studio System

- **Input**
 - **4 x HDMI v1.4**
 - 2160p 30/25 on one HDMI*
 - 1080p 60/59.94/50/30/29.97/25
 - 1080i 60/59.94/50
 - 720p 60/59.94/50
 - **PAL, NTSC**
- **Output**
 - **2 x HDMI v1.4**
 - 2160p 30/25 on one HDMI*
 - 1080p 60/59.94/50/30/29.97/25
 - 1080i 60/59.94/50
 - 720p 60/59.94/50

Video standards

Reckeen SDI Virtual Studio System

- **SDI**
 - **SMPTE-425M**
 - 1080p (60/59.94/50/30/25)

- **SMPTE-292M**
 - 1080p (30/29.97/25)
 - 1080i (60/59.94/50)
- **MPTE-296M**
 - 720p (60/59.94/50)
- **SMPTE-259M**
 - PAL, NTSC
- **HDMI**
 - Video standard – HDMI spec 1.4*

Reckeen HDMI Virtual Studio System

- **HDMI**
 - Video standard – HDMI spec 1.4

Features

- **Downstream Key – x2**
- **Media Format**
 - MPEG2, MPEG4 and H.264 containers: (avi, mpg, mpeg, mp4, mxf, mov)
 - Audio: WAV, MP3
- **Video Capture Format**
 - H.264 (.mp4) MPEG-2 (.mpg)
 - 1080p 60/59.94/50/30/29.97/25
 - 1080i 60/59.94/50
 - 720p 60/59.94/50
 - H.264 up to 4k 30p*
- **Still Picture – x2**
- **Picture Format**
 - .png .jpg, .bmp
- **Still Text – x2**
 - Still Editor included
- **Keyer – x4**
 - Chroma Key/Luminance Key
- **Streaming**
 - Facebook,
 - YouTube,
 - NicoNico
 - Ustream

- NDI
- and custom profiles

Software

- **Reckeen 3D package:**
 - 3D Production
 - 3D Studio Editor
 - Wizard
 - MS 3D Paint
 - Still Editor
- **Reckeen Lite package (as an additional option for the 3D version):**
 - Lite Production
 - VSM Lite Editor (also as a standalone version)
 - Still Editor

* Reckeen LITE studio offers a Full HD resolution. By purchasing additional License Key, You can upgrade it to 3D Studio & LITE with 4K resolution.



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