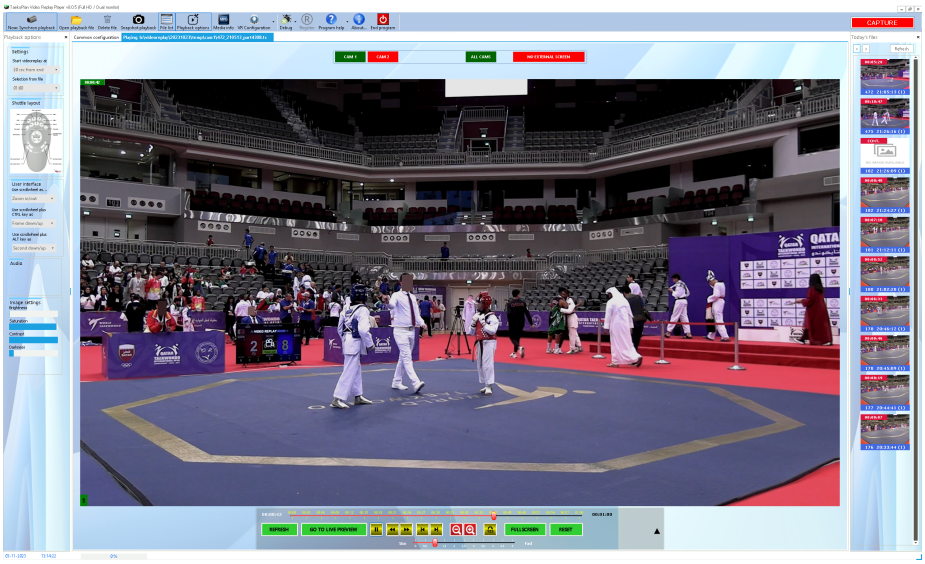
# Taekoplan Video Replay v8





# Title page 1

## Introduction

***by SenSoft Automation - The Netherlands***

*TaekoVRHD is software for adding video replay to your event.*
*It is able to handle Full HD / 4K and multiview camera devices.*

# Taekoplan Video Replay v8



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**Special thanks to:**

*All the testers for their hard work and the European Taekwondo Union for allowing me to use a European Championship as first major event!*

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# Part I

# 1 Introduction

# TaekoVRHD v8

## Latest version: 8.3.0

**TaekoVRHD.NET is a tool for capturing and playback of video for the video replay during taekwondo events.**
**It can be used for any sport like Karate or Judo.**


**It can be used with standard or high definition consumer camera's. See appendix for specifications!**
**It also support IP camera's with different resolutions.**


# Part II

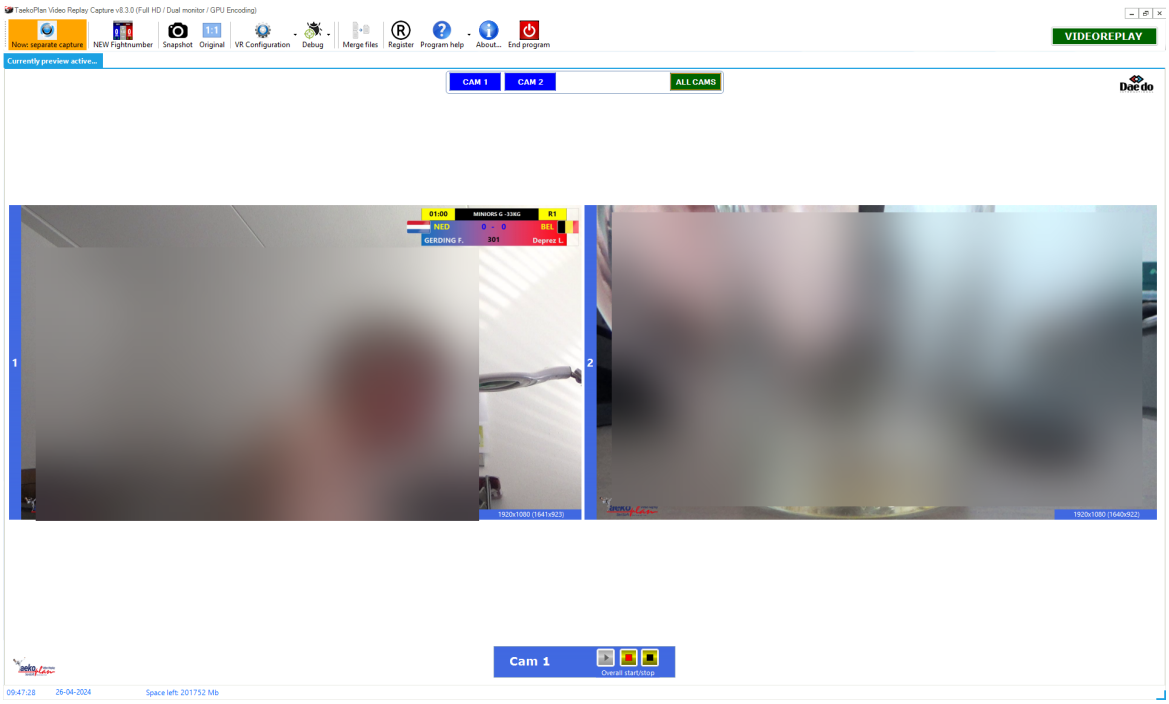
# 2 Main modules

This section contains basic information about the main modules of the video replay software.
The software is split into two separate programs, one for the capture and one for the videoreplay.

## 2.1 Capture

The capture is the central part of the video replay software. Up to two cams can be attached at the same time.
Each camera needs to be configured 15 before it can be used.

There are two views with preview/capture options. The first view only shows the two preview/capture screens (one for each cam).
The second one shows a combination of preview and playback.




The previews are fitted into the available space on the screen. Aspect ratio is also maintained for the previews.

On top you see the cam navigation bar:


You can select each of the maximum 4 cams to be shown as single cam on the screen or all cams together in a matrix.
The active option is colored green.The other available, but not active camera's are coloured blue.

Each capture preview has a button bar available which appears when hovering over the preview screen with your mouse.

Start the preview for the selected camera. After clicking this button, the button will switch to

to disable it.

Start the capture for the selected fight. The button will switch to disabled state

So you can not click it twice.

Stop the current capture if active, if only preview is active, it will stop the preview and will remove the preview image.

Capture can be done either for any standalone camera's or for all camera's synchronized.

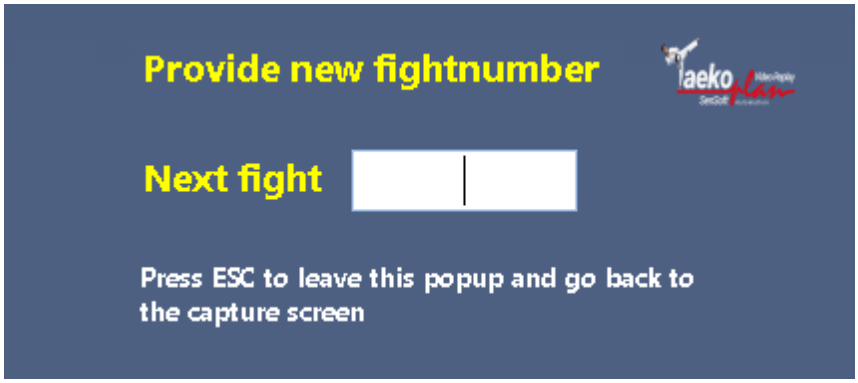
If you want to use synchronized recording, use the menu option on top to activate this by clicking the **Synchron (asynchron) recording (2 cams)**.


Synchronized recording means that both cams will be started shortly after each other. To avoid that they get out-of-sync, a mechanism is built in to keep them on track towards each other.
If one cam falls behind for whatever reason, the other one will just 'wait' and resume. So we can guarantee that both recordings have the same timeline.
This is important during playback when you can switch between the two cams.

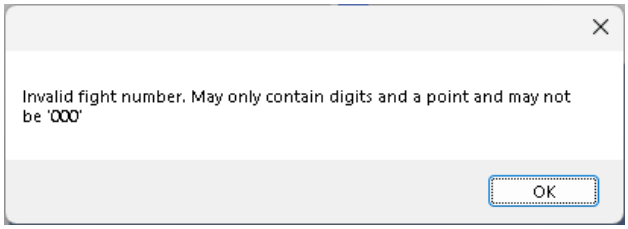
Before you can start recording, you need to enter a fightno. This fightno. is part of the filename of the recording(s).w
The fightno. can only consist of digits and a point if applicable.

When starting a capture, the fightnumber entry will come automatically. At any time you can click


to get the entry form.

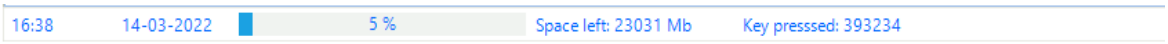



if you don't enter a fightnumber. you will get a notification:




**Note: if you have enabled audio recording, then the audio output of your system is set to 0, so no output. This has to do with the fact that the microphone and speakers of your system will interfere and produce a very high sound, which might also cause problems with your system.**

On the bottom of the mainscreen you see the statusbar:




You can see the date/time as well as the CPU Usage (5%) of the application.
The space left shows you the number in Mb's on the storage drive.
The message next to this shows you the latest recorded info message from the system.

### 2.1.1 Capture Configuration

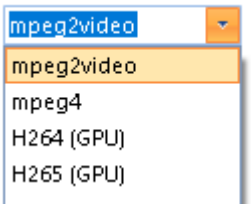
This version of the Video Replay software is capable of capturing and watching the footage at the same time.

For that you need to setup the camera config as follows:

**Encoder to be used**

Select the encoder for creating the capture file.

There are four options:



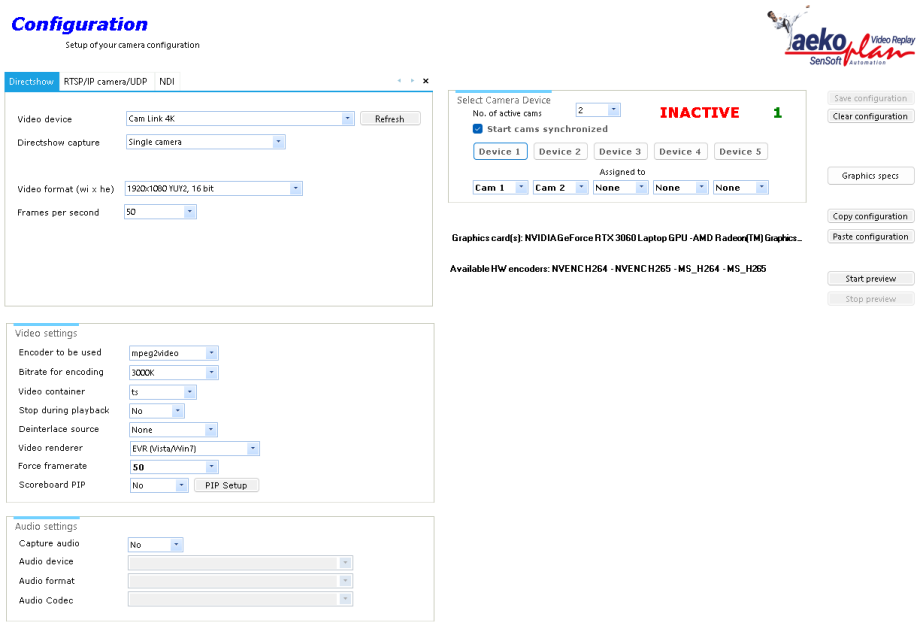

Select the encoder you want to use. Most common for .TS files (transport stream) as mpeg2video or mpeg4.
They will allow you to open the currently captured file and watch it at the same time.

So:

- Use mpeg2video or mpeg
- Set the bitrate to 3000K
- Set the video container to .TS

### 2.1.1.1 Camera config

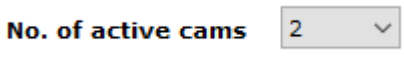
The camera config enables you to provide configuration for up to 5 devices.




See the child chapters for detailed info how to configure.

#### 2.1.1.1.1 Select camera device


First of all, select the no. of cams to be used (synchronously or asynchonously).




Up to 4 active cameras can be selected.

**Start cams synchronized**

Check this box if you want to start multiple cams at the same time for preview and capture.

**Refresh preview**

Refresh the preview as shown in the black area

**IP Camera database**

This will point you to the ISpyconnect.com website.

**Clear configuration**

This will clear the whole configuration for the selected device so you re-enter information

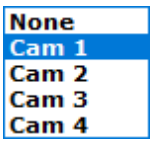
**Save configuration**

Saves the current configuration for the selected device

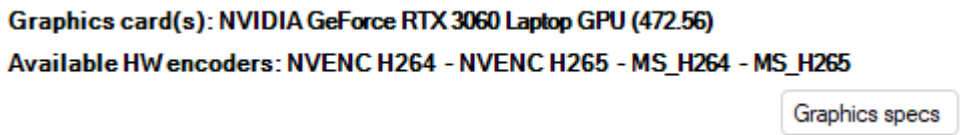
Next step is to select the device for which you want to do the setup:

You can setup upto 5 devices and assign them individually to a camera in the program.

To assign them, open the pulldown to select the camera.



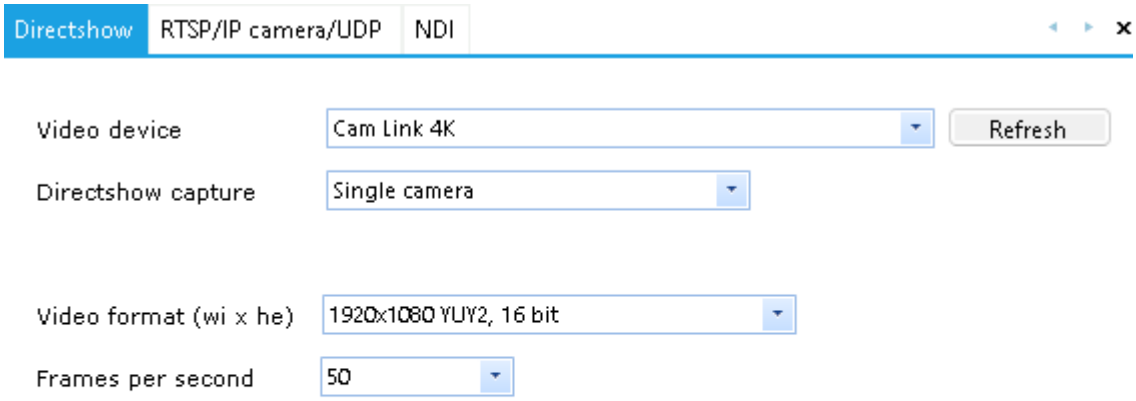

If a camera is not available at startup, the **ACTIVE** caption will change to **INACTIVE**.
You can create 5 configurations and select the Cam number to give them the correct order.
Upto 4 cams can be shown simultaneously.




This is an overview of the capabilities of the graphics card

2.1.1.1.2 Video device

For the type of videosource there are three options:



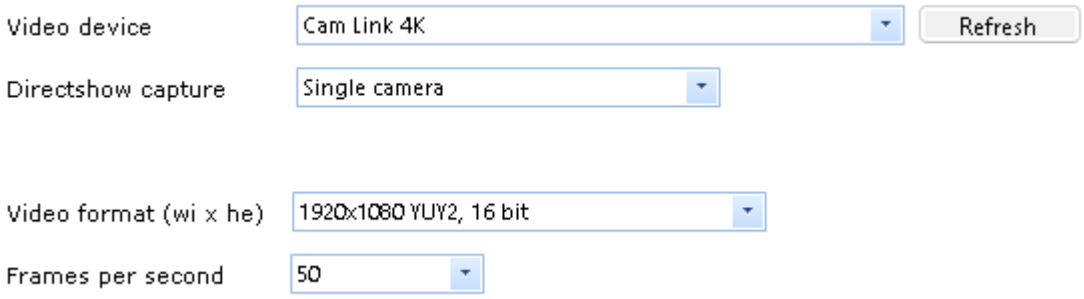

Available options are: Directshow, IP camera and NDI stream.

**Windows camera device (AVCHD)**

This is a cam like Sony, Panasonic or JVC handycam which is connected through Firewire,
AVCHD is standard format which provides compressed HD video.

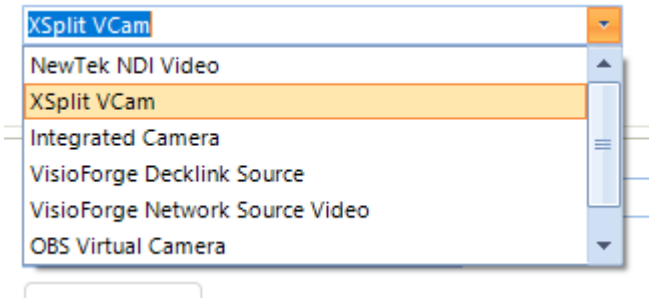
2.1.1.1.2.1 Directshow

**Windows Directshow Device**




Any camera that is recognized by Windows OS as a valid camera. It should appear in the Device Manager.
It can be any camera connected to USB2/3 or Thunderbolt port.

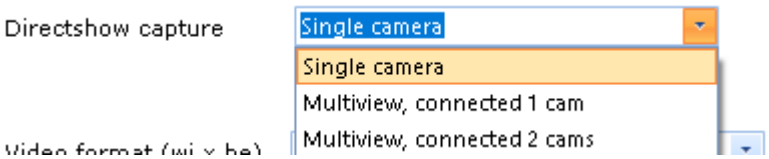
For example an external webcam, Camlink HDMI, Magewell HDMI etc.




This is just an example list. Your devices might be different.

**Directshow capture**

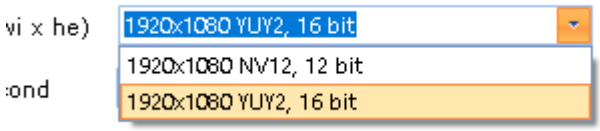
This is the way the camera is being handled by the software




Single camera does read the stream as is from the inputsource, a camera or a webcam.

**Video format**

This is the format that you want to use as inputsource




The formats are coming from the camera device itself.

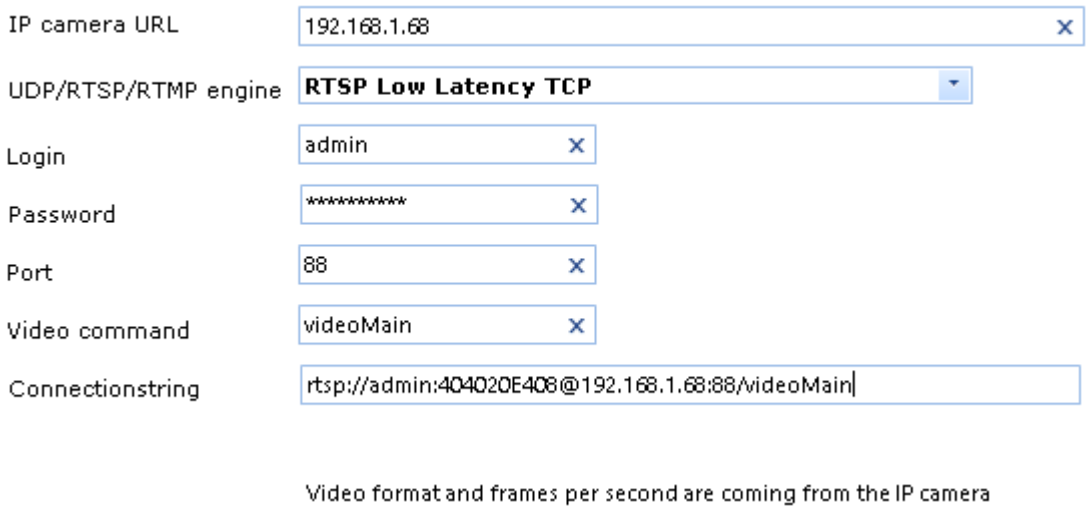
**Frames per second**

This is the framerate of the inputsource. This can be any reate, for example a camera might provide 50fps whereas an IP camera only provides 25 or 30fps.

2.1.1.1.2.2 IP camera

**UDP / RTMP / RTSP (IP Stream)**

This is an IP camera connected over a network which can be reached with a specific IP address.

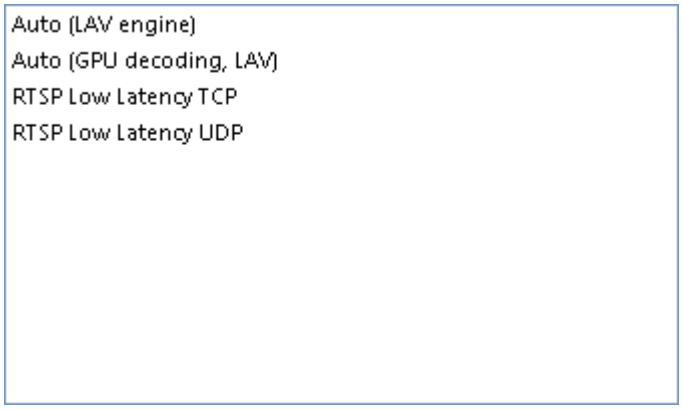



**IP Camera URL**

This is the plain IP address for example 192.168.1.68. No additional parameters needed.

**UDP/RTSP/RTMP Engine**

This is the engine used for reading the stream coming from the IP camera.




**Login**

This is the login required to access the camera videostream.

**Password**

This is the password for access

**Port**

This is the portnumber for the camera

**Video command**

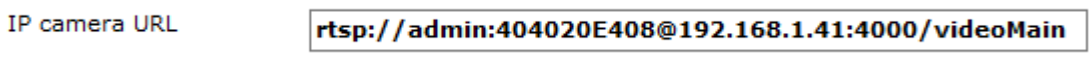
This is the parameter required to retrieve the correct videostream from the camera.

**Connectionstring**

This string will be used to access the camera in the application. It is combined from all of the 5 input fields mentioned.

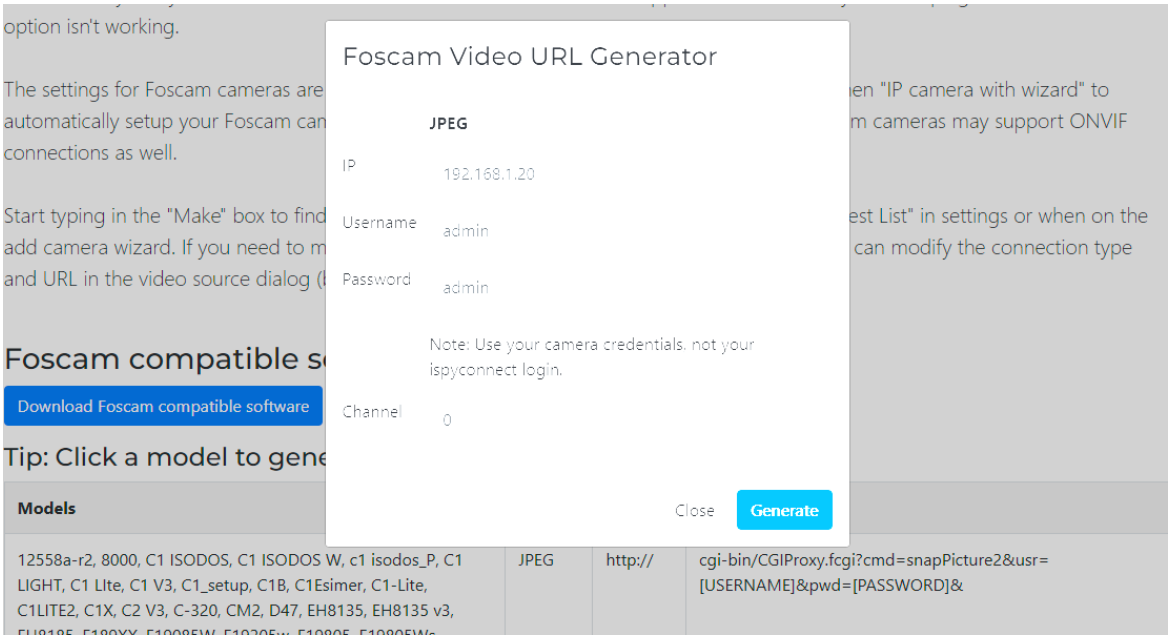
As each camera has it's own connection string, we can not give a full list of camera's and how to connect them.

For example for a Foscam it would look like this:




And for a Reolink 820a: **rtsp://admin:xxxx@192.168.1.xx/h264Preview_01_sub**

There as several websites that can provide you with the correct URL to enter here.
For example: [Connecting to IP Cameras (ispyconnect.com)]

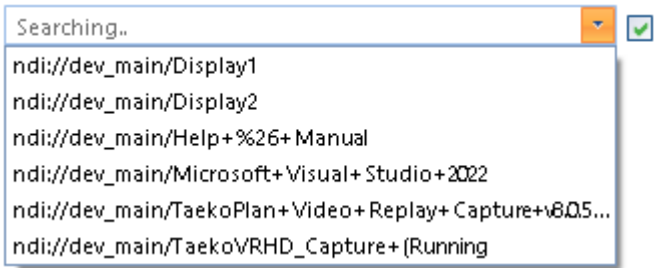



2.1.1.1.2.3 NDI Stream

You can also read NDI streams:


**NDI Source**

The NDI sources will be picked up automatically when you open the tab.




Select one of the sources.

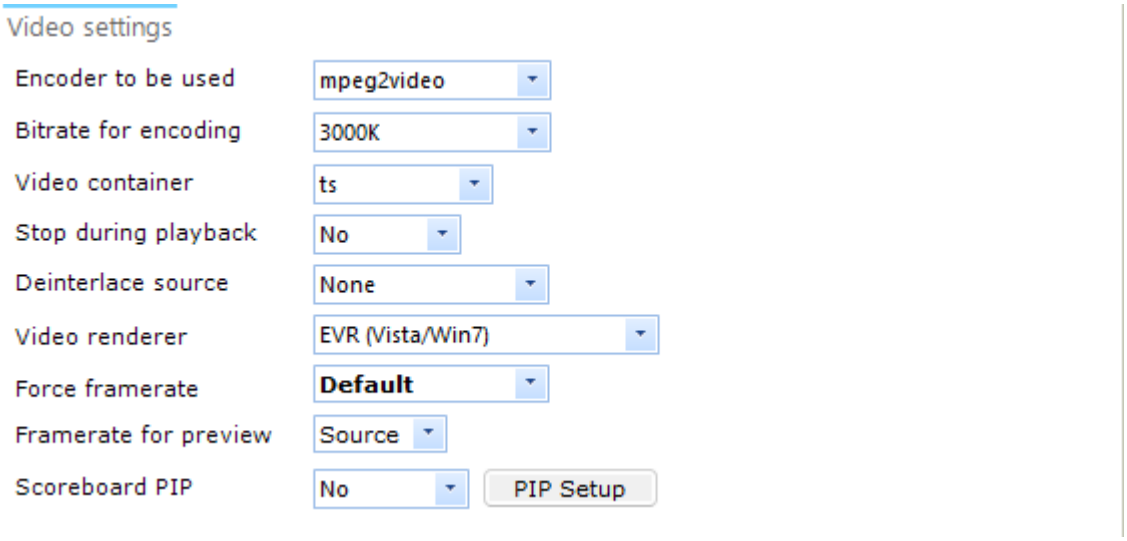
**NDI Engine**

You can choose the latest NDI API interface or an older one, called **Legacy,** which will work for all NDI devices connected.

**Local NDI**

When you check this box, the NDI search engine will only look for local sources, otherwise the whole network segment will be checked.

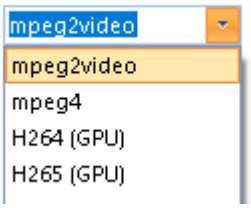
2.1.1.1.3 Video settings




**Encoder to be used**

Select the encoder for creating the capture file.

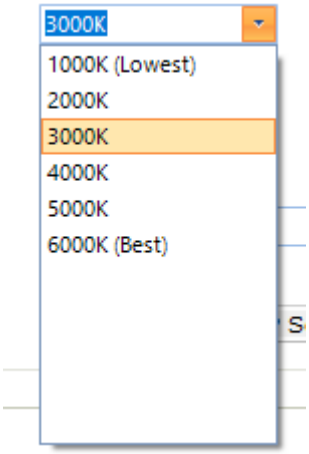
There are four options:




Select the encoder you want to use. Most common for .TS files (transport stream) as mpeg2video or mpeg4.

**Bitrate for encoding**

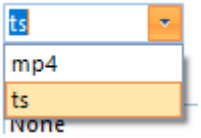
Select the bitrate for the capture file. The quality goes from less good to high.
Please select the correct one based on your requirements and diskspace.




Select the one you want to use.

**Video container**

Here you select the type of container for the video file. If you are not known with these, please leave it at ts.
MP4 is a container which needs a stop to be able to play the file, whereas.TS allows the outputfile to be played while capturing.

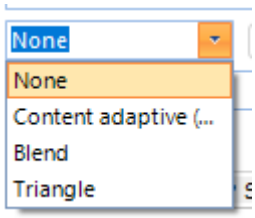



**Stop during playback**

If you so not want to capture during a break between fights, set this to Yes, otherwise leave it to No. Capture will by default not run between fights.

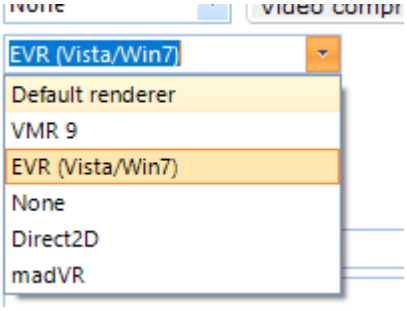
**Deinterlace source**

If you have an interlaced video input, you need to de-interlace it to avoid stripes in the picture.
The following options are available:




**Video renderer**

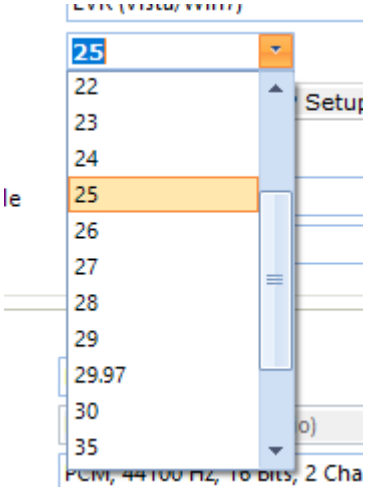
The video renderer is the engine which creates the picture on your screen.
The following renderers are available:



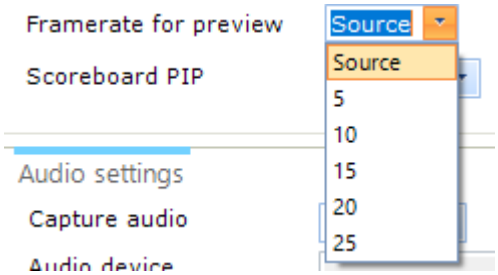

Each has its own specifications. Choose the one which provides you the best picture.
This highly depends on graphics card used.

**Force framerate**

The framerate is the number of frames per seconds provided by the camera device.
Most common are 25, 29.97 and 30 fps.
Select the default or one of the possible framerates or use default if you do not encounter issues with capture.




**Framerate for preview**



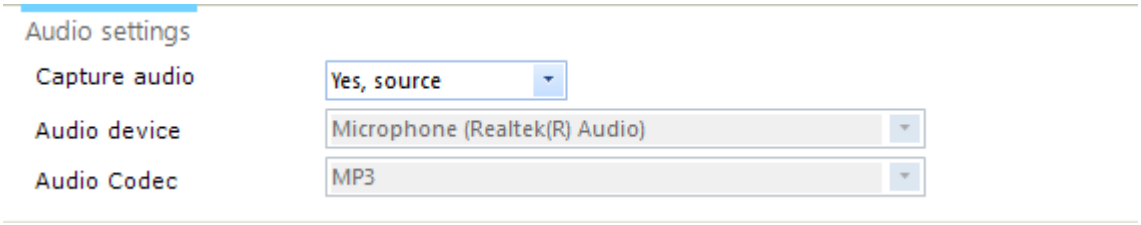

When you have issues with high CPU load or memory usage, you can change the framerate used in the preview window(s).
For example, if you have two windows, each showing a 50 fps stream from the camera's, your CPU usage might become high.
Also memory usage will increase. In order to lower it, you can change the framerate to a lower number.
25fps is perfect for a preview.
Note that the capture is **ALWAYS** at the requested framerate (so 50fps will be captured as 50fps).
Only change this if the provided framerate is higher than 25. In any other situation (for example using IP Camera's) you do not need to change this setting.
Leave it on **Source**.

**Scoreboard PIP**

This allows a picture-in-picture of the scoreboard.

For more info see the Picture-in-picture 48 topic.

2.1.1.1.4 Audio settings




**Capture Audio**

Select **No** if you do not want to capture audio, **Yes** if you want to capture audio using the Audio device selected.
And select **Yes, source** if you want to capture audio coming from the source (for example an IP camera).

**Audio device**

Select a device to be used from your system. The available ones are listed in the box.

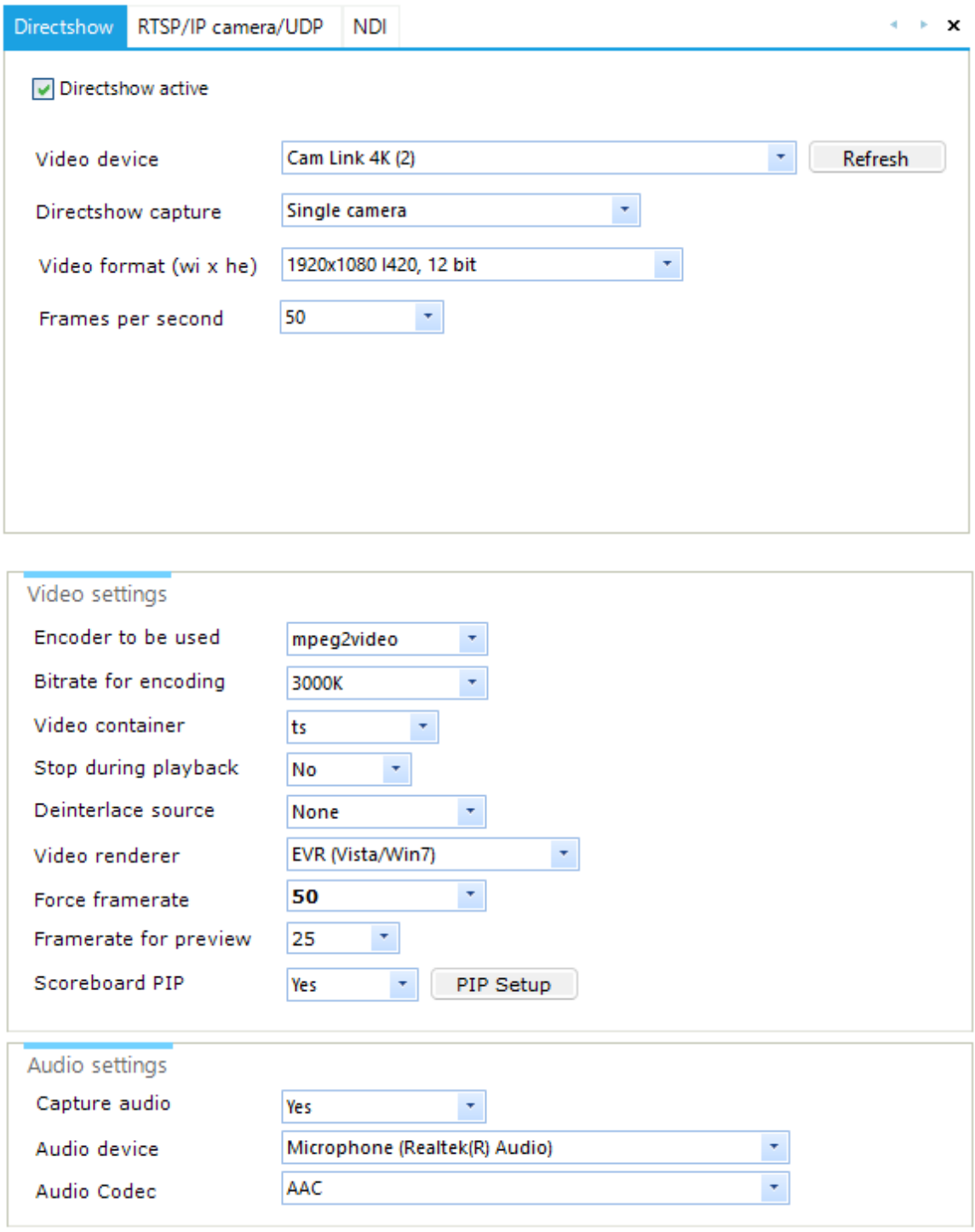
**Audio codec**

This is the type of encoding for the audio.
If you want to use audio for playback also, you can use either AAC (Uncompressed) or Mp3 (MPEg-3 layer, compressed).

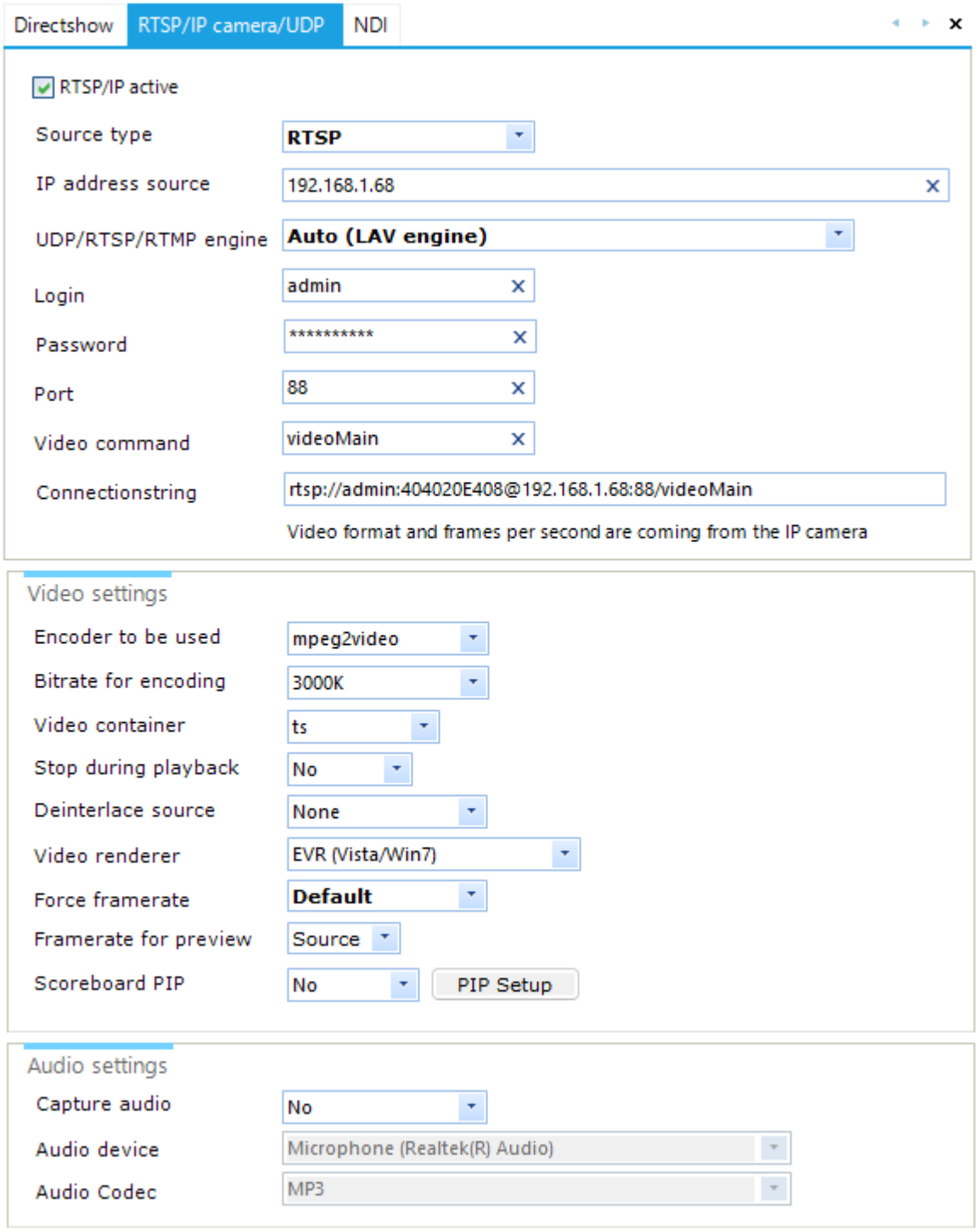
2.1.1.1.5 Sample configs

Below are two configs shown for a directshow device and for an IP camera:

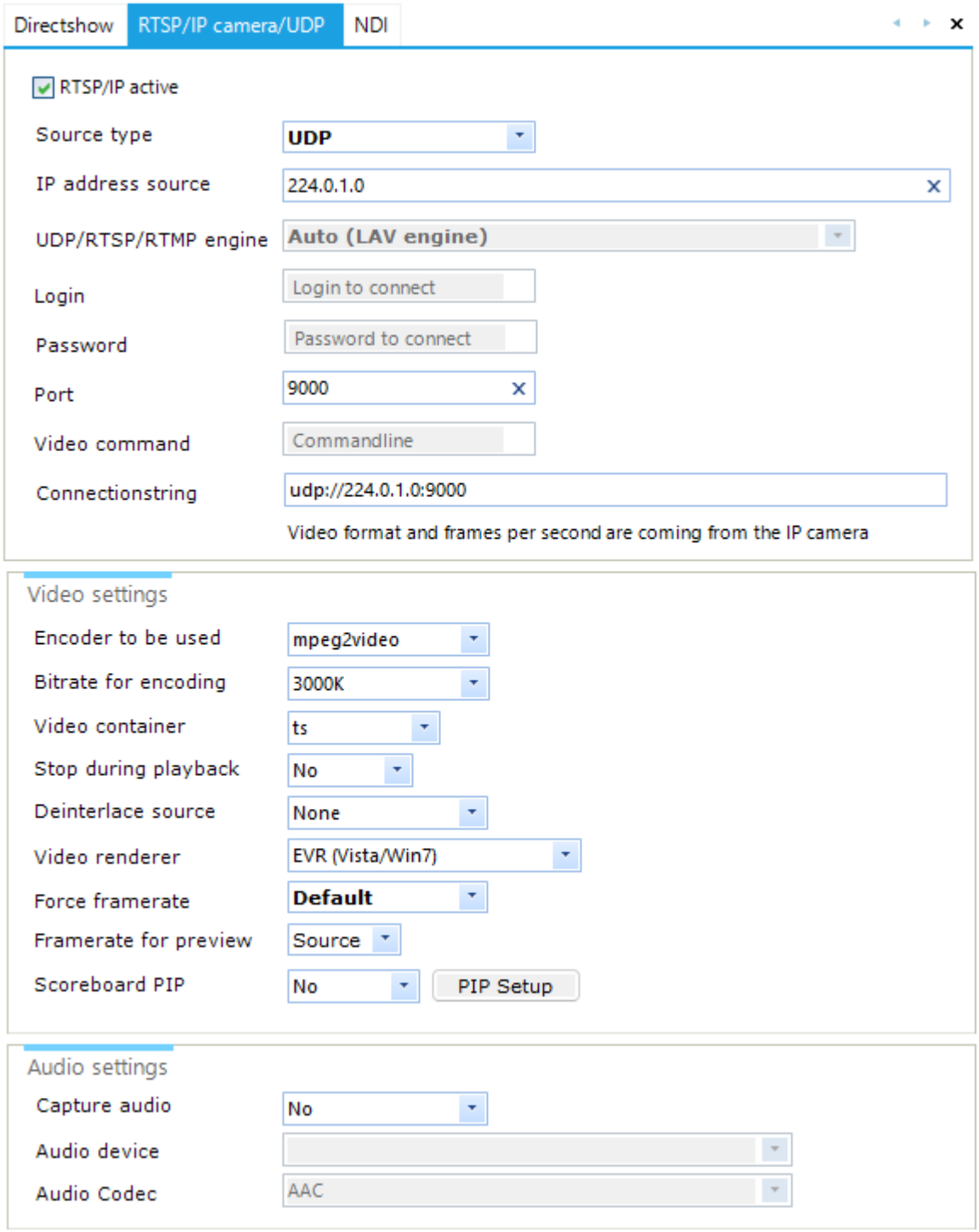
**Directshow device:**



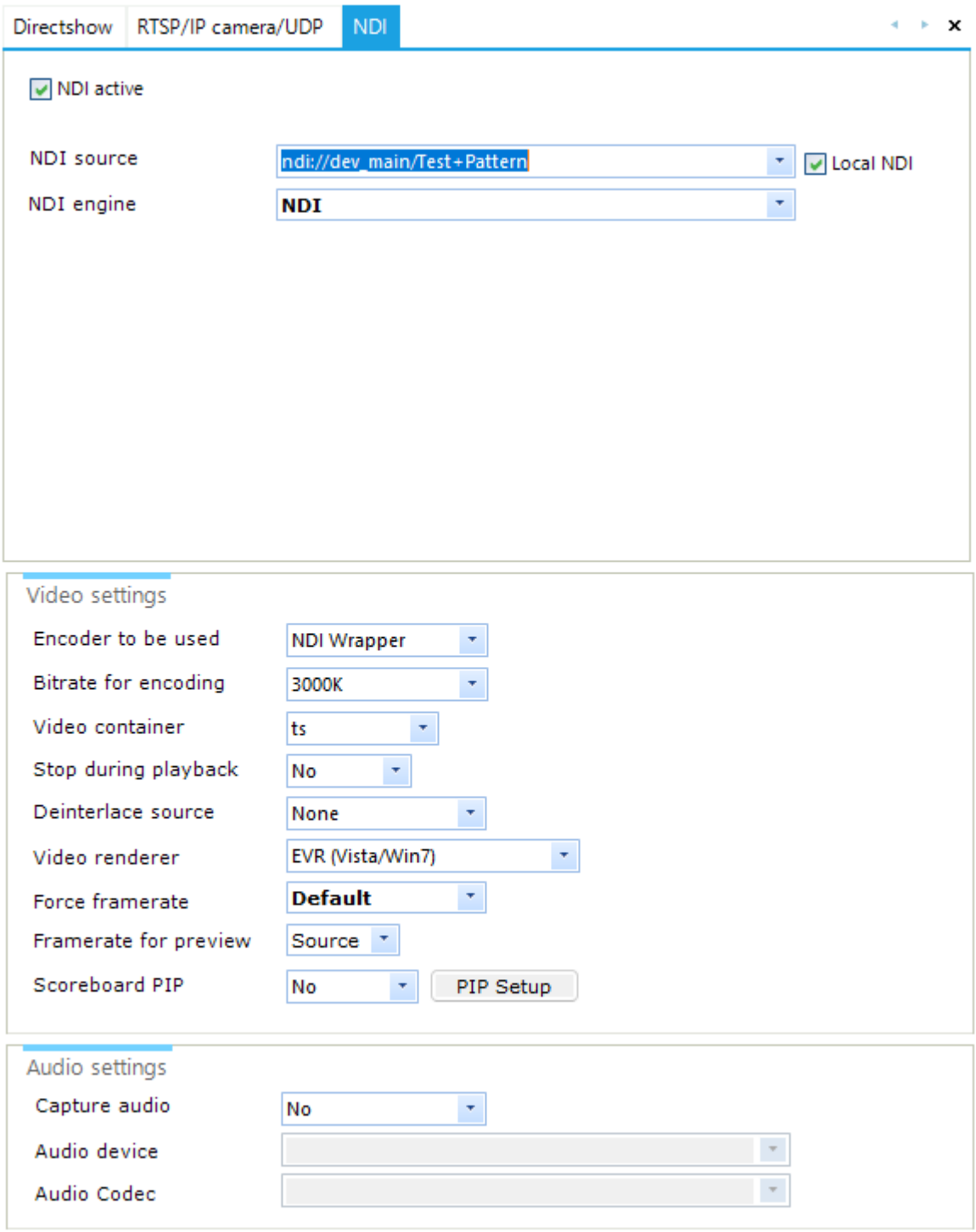

**IP Camera over RTSP**




**UDP Stream**




**NDI Input**




For IP camera's it is important to use TCP as protocol, not UDP.

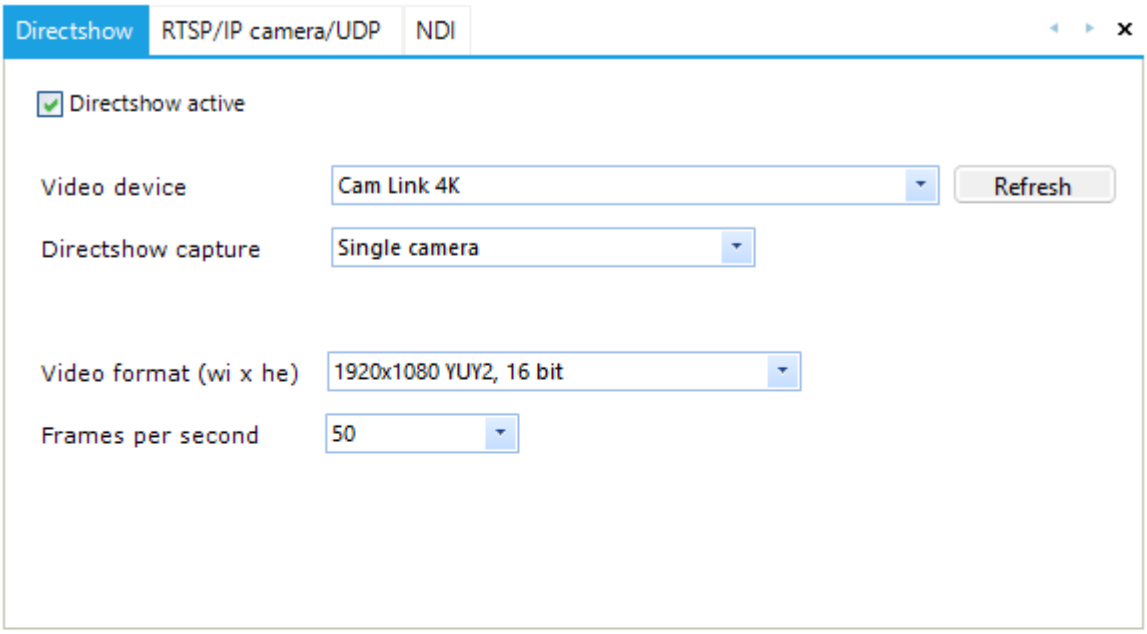
You can check for the preview to be working:

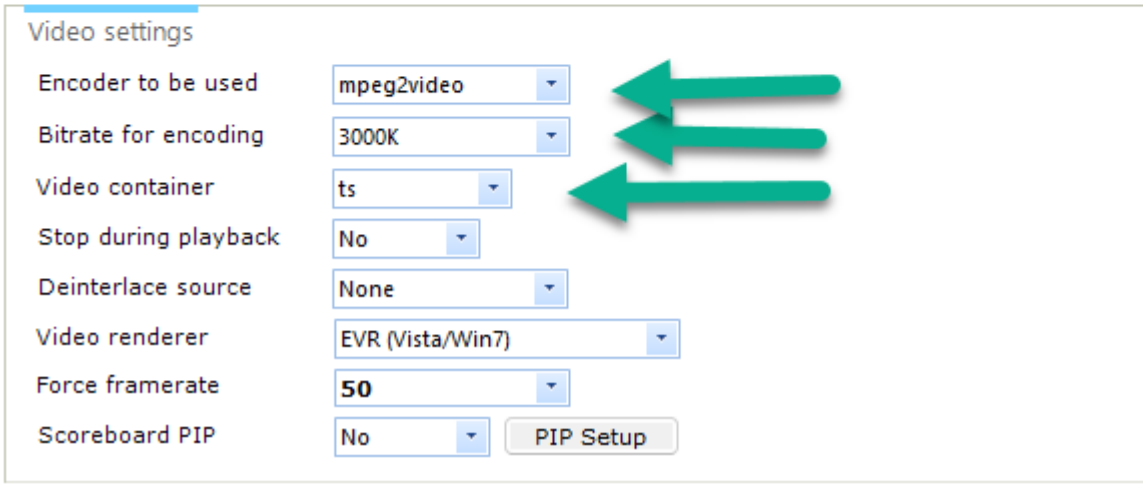

2.1.1.1.6 Watch while capturing

This version of the Video Replay software is capable of capturing and watching the footage at the same time.

For that you need to setup the camera config as follows:

**- Use mpeg2video or mpeg (encoder to be used)**
**- Set the bitrate to 3000K**
**- Set the video container to .TS**



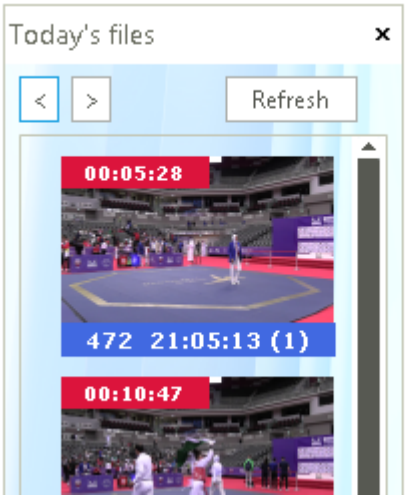




If you use these settings (you can apply them to directshow or IP camera's) you are able to watch the footage while the capture continues.
You do not have to start/stop the capture.

Just start it and enter a fictitious fight number. Capture will start and click on the


button to open the player.

In the filelist of the player it will always be the first shown capture:




The outputfiles created will have the extension .TS (transport stream).
Double clicking on the image will open the footage.
This is also required if you want to refresh the watched footage to the latest timestamp.

#### 2.1.1.1.7 What devices are best to use...

Basically, you can connect any type of device to capture.

Based on experience, you might go for specific options as there are more conditions to be met before you can succesfully capture.

**Camcorders**

Camcorders might provide the best quality.
There are more brands with good camera's (Sony, Panasonic), based on HDMI output.
You can connect these camera's to your laptop by using USB Video devices.
To get to 50fps you should use USB3 devices, but please be aware that a lot of the cheaper USB Video devices are not compatible with USB3.
They will work, but only at 25fps.


Rather use a somewhat more expensive device like the **Camlink 4K**. This one is USB3 compatible and can provide up to 60fps per camera.
Only issue could be that you need one USB3 port per device, so you can't use a USB hub and the USB3 ports need to have a separate **Root Hub**.
If not you can only use one camera.


If you want to use a USB Video stick from any other brand which is USB2 compatible, you are able to use more devices on the same USB Root Hub.
But still you will manage 50fps. A lot of the cheaper brands give 50fps as specification, but we tested a lot of them and the result was very annoying.

**Multiview**


You can also a multiview device which allows you to input up to 4 HDMI device and bundle this to a 4K HDMI input for the laptop. You need to split this into 4 camera streams in a 4 camera raster. The software is able to split this raster in 4 separate videostreams, each Full HD.
You can select the option in the camera configuration.

**IP camera's**

You can use up to 4 IP camera's easily. As most Full HD IP camera's are using 25 or 30 fps, connecting them is quite simple. Quality is ok but especially with Video Replay it is importnt to have more frames per second rather than the best quality picture.
If you want to connect an IP camera, you need to have the correct connection information. Every IP camera provides a videostream which needs to be opened.
Most of the time you need login, password and the correct string to connect.
Check the camera manual or search in the camera config. There is a button to show a database of IP camera's and how to connect them.

**IMPORTANT:**

At any time, your laptop should be able to process the incoming data!
Using a laptop with I5 processor might not be the best choice. You need at least I7 and SSD disk to be sure.

And a 4K camera input over HDMI needs 4 times the bandwidth of a Full HD input.
Two camera's, both 50fps Full HD, are almost the maximum for a good laptop.
For IP camera's, you can easily connect 4 of them.

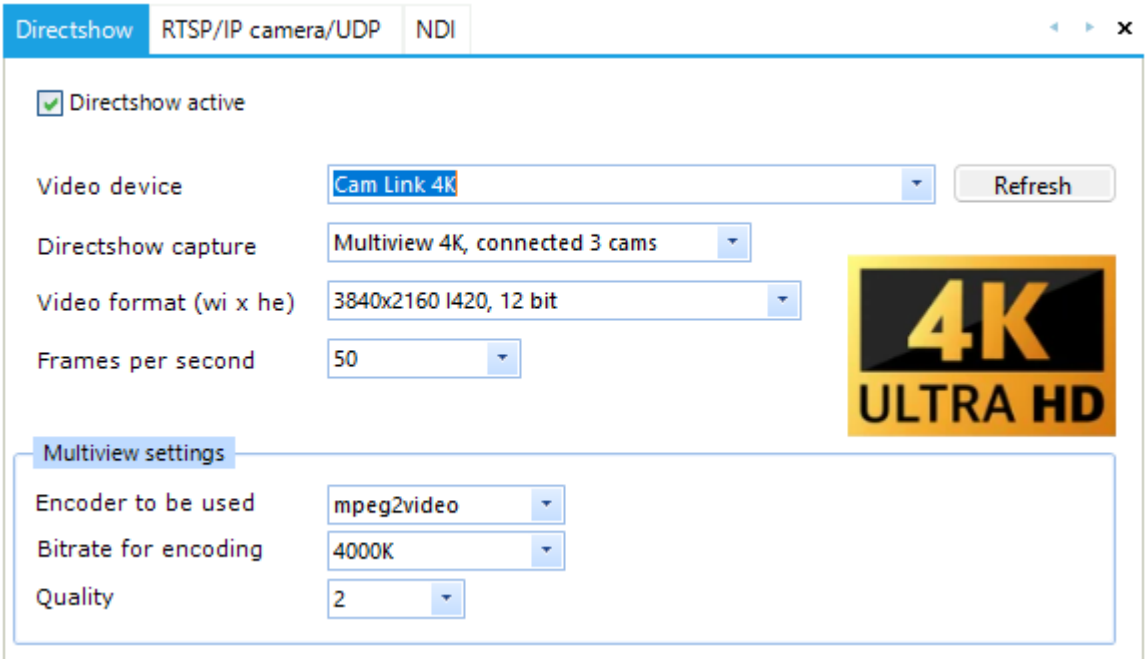
#### 2.1.1.1.8 Multiview 4K

In the device settings you can tell the system to handle the input as Multiview input.
If you have a multiview device with 4 inputs and 1 output providing a 4K signal, you can split that into 4 separate video streams in the software.


You need to use a device which is capable to provide the 4K signal to the computer. This can for example be a Camlink 4K.


After connecting the device, it is visible in the list of devices.


For the Multiview input, use the following settings (these are examples, you may change them accordingly):




The video device as mentioned (this can be any brand device capable of providing 4K stream).

The Directshow capture is not a single camera, but it is coming from the Multiview device.
Please make sure to provide the correct number of inputs.
The devices do not have to be named as Cam1, Cam2 and Cam3, but can also be Cam2, Cam3 and Cam4 for example.

The video format will be 3840x2160 (4K). The frames per second is most of the time 3ofps or even 60fps (depending on the device).

When you use the Multiview, a separate stream is created because the Camlink can only be used once.
So one stream is picking up the Camlink stream and is being split into max. 4 separate streams.
The streams are considered to be Full HD camera's and as such handled as camera's.

The whole way of working is just as if you are connecting 4 camera's to 4 devices on your system.
But that scenario is not possible as you would need 4 separate root hubs for your USB-3 connections.

So a Multiview is a perfect way of handling multiple camera's on one computer.

The Multiview settings are used to provide the stream to the camera  streams.
The settings as shown are default and most of the time sufficient.

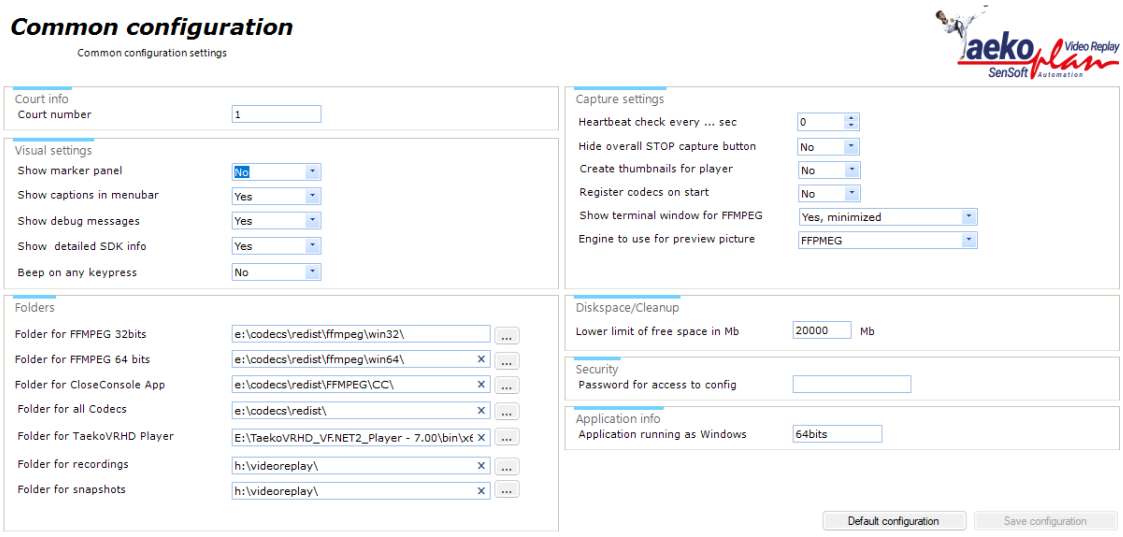
The quality is a parameter, the lower the better! So not the other way round.

Also bear in mind that using 4 camera's will only work smooth with at least an I7 or AMD Ryzen 7 processor.

Important: as the video device (like Camlink) is providing 4 streams, there is no audio currently provided.
That will be coming in a future update of the software.

### 2.1.1.2 Common config

The common configuration contains settings that define specific user requirements.




#### 2.1.1.2.1 Visual settings

Visual settings are as follows:

**Show marker panel**

This will show or not show the marker panel on the capture screen.


**Show captions in menubar**

Set this to Yes to display the text captions in the menubar of the program.
Setting No will only show the icons

**Show debug messages**

Set this to Yes to show all messages, including errors.

**Show detailed SDK info**

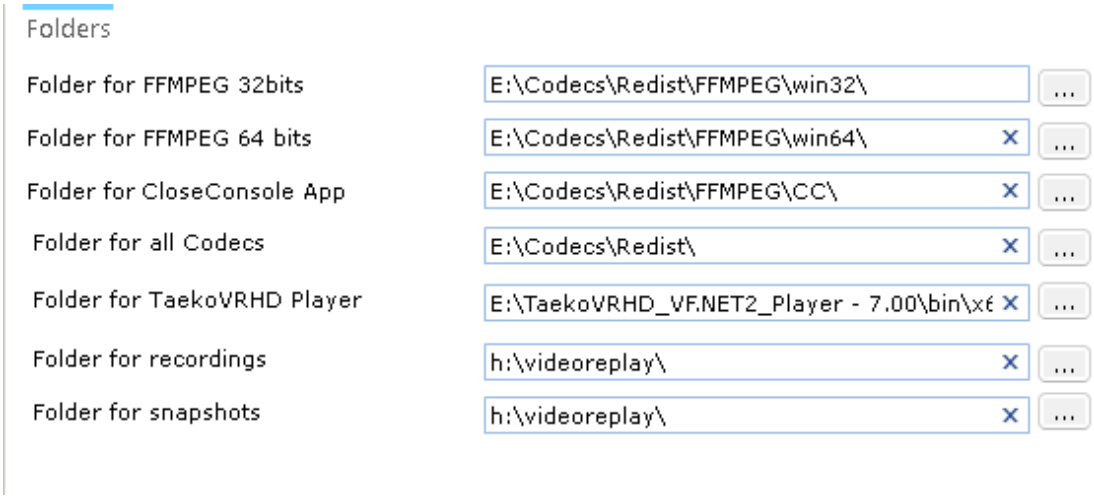
Set this to Yes to show detailed info messages from the used SDK

**Beep on any keypress**

Set this to Yes to hear s system beep when a key is pressed. This might be useful if you are in doubt whether a keypress reaches the program

2.1.1.2.2 Folders

You can provide the required folders for the correct operation of the software:




**Folder for FFMPEG 32bits**

This is the path to the folder where FFMPEG32.EXE (32bits version) is located. By default it is in the Redist folder.
The FFMPEG.EXE is important for many parts of the video-replay system, so check for the correct path!

**Folder for FFMPEG 64bits**

This is the path to the folder where FFMPEG32.EXE (64bits version) is located. By default it is in the Redist folder.

**Folder for CloseConsole App**

This is the path to the folder where CloseConsole.EXE is located. By default it is in the Redist folder. Please note that those three settings are going to be obsolete in one of the next versions of the software.

**Folder for all Codecs**

This is the path to the folder with all the required codecs for the program. By default it is the 'Codecs/redist' folder in the installation.

**Folder for TaekoVRHD Player**

This is the path to the folder where the player is installed.By default this is the application folder.

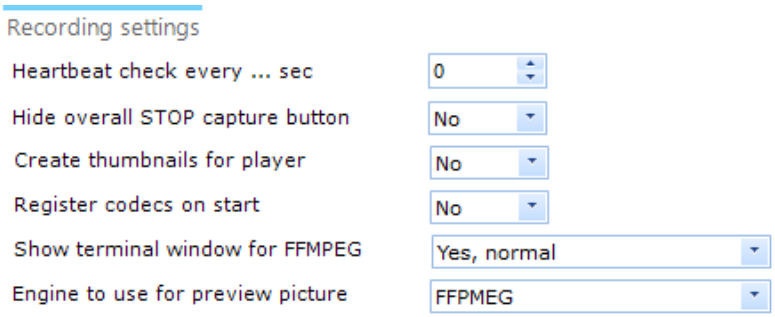
**Folder for recordings**

This is the folder where the recordings will be stored.
In the folder a date stamp is applied by the software to distinguish between the days.

**Forder for snapshots**

This is the folder where the snapshots will be stored.

2.1.1.2.3 Capture settings




**Heartbeat check every ....sec**

Set a value in seconds to enable the heartbeat check. If set, the system will check for a recording to be saved to disk. If there is no change in the disksize, most of the time this points to an error in the configuration.
If the heartbeat is reached without any change in disksize, the capture will stop.

**Second (full)screen during preview**

Set this to Yes to allow a fullscreen to show when double clicking on the video area.

**Hide overall STOP capture button**

Set this to Yes to hide the stop button for accidental clicking.

**Create thumbnails for player**

Set this to Yes to create thumbnails each second of the image stream from the device. When these are available you can select them to be shown in the player.

**Register codecs on start**

Set this to Yes to register all codecs in the default codecs folder to be registered.

**Show terminal window for FFMPEG**

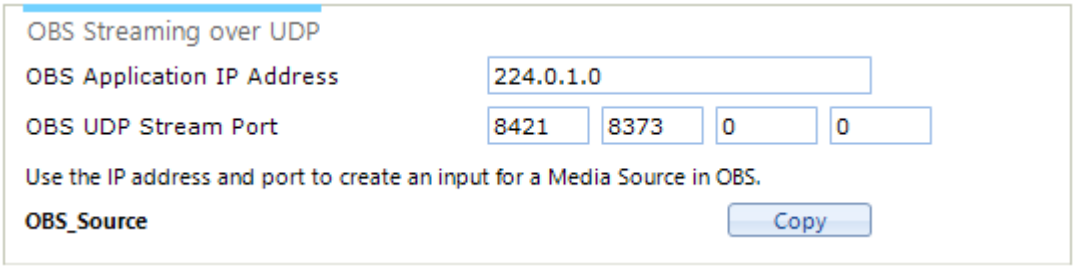
When enabled, the terminal window will be shown for preview and capture. This is meant for checking purpose. If all is running smooth, you may hide the windows.
The three options are 'Yes', 'Yes, minimized' and 'No'.

**Engine to use for preview picture**

This is the engine which is used when showing the preview in the capture application. It depends on OS/CPU and graphics card which engine is best to use.
If you do only see a black picture, you need to switch.

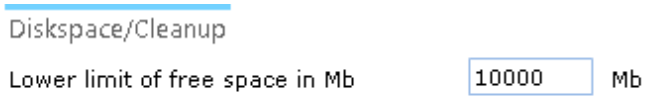
**NOTE:**

In version 8.3 the OBS stream 44 is already by default available on IP address 224.0.1.0 and the ports mentioned in the connection config module:




So for camera 1 the stream URL is **udp://224.0.1.0:8421** and for caera 2 it is **udp://224.0.1.0:8373**.
You can use this stream for any other streamserver that accepts udp streams.

2.1.1.2.4 CleanUp

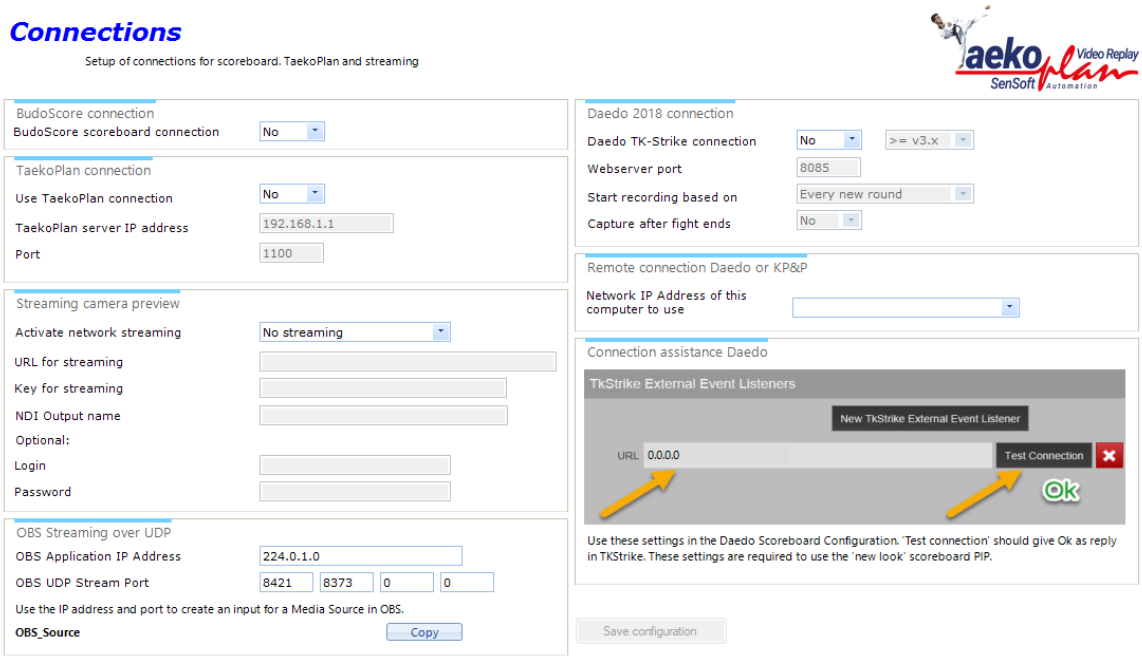



**Lower limit of free space in Mb**

This is the limit of remaining diskspace for the capture to stop.
The operator will be notified that there is nog diskspace left.
Set the limit to for example 10 Gb. This looks a lot, but the capture outputfiles are written using cache, so the remaining diskspace can never be calculated exactly.

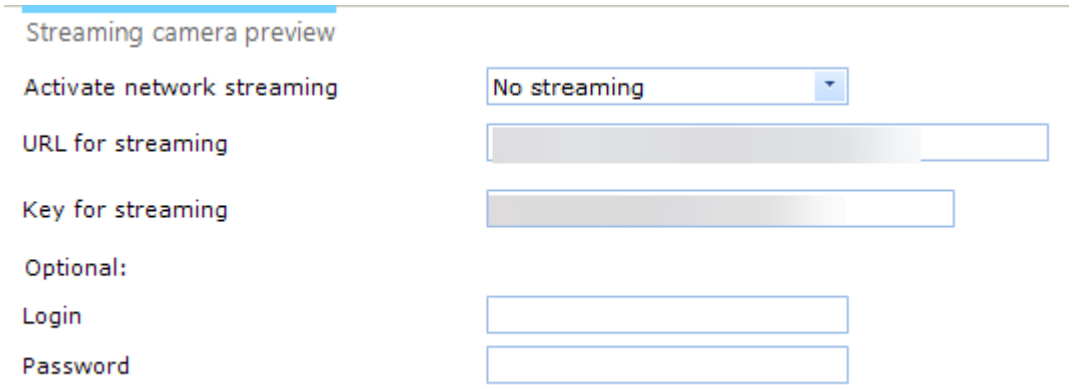
### 2.1.1.3 Connection config

The connection configuration provides the options for connecting to specific software.




You can connect several programs to the video replay system to make it work fully automated or to provide streaming.
see the child chapters for more info on the specific topics.

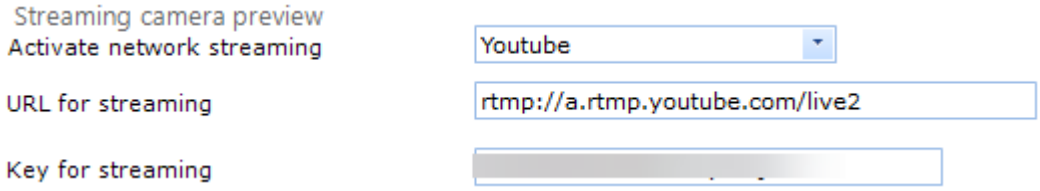
2.1.1.3.1 Streaming camera preview




You can directly stream the picture of the first camera device to a streaming service on the internet.

At the moment we support any service, Youtube is named as such, but by using the appropriate URL and key/login combination you might be able to stream to any service.
If you need assistance on this or a small change in the program to achieve it, please call our support team.

For Youtube streaming you need to have an account with Youtube. This can be a free account at any time.




Select Youtube from the list and provide your key, linked to the channel you want to use.
You can create more than 1 channel on Youtube.

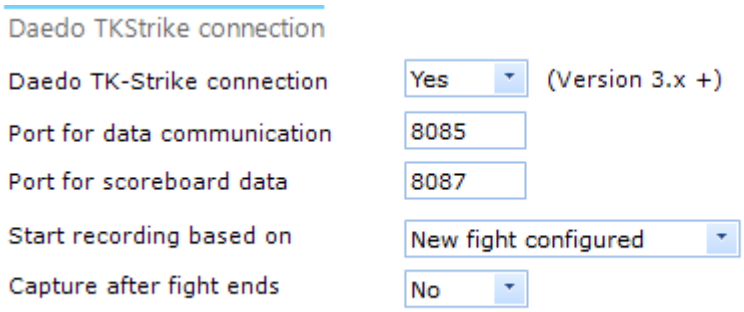
The RTMP URL is the default one for Youtube; they also have a backup URL.
The streaming is tested and working on a free Youtube account.

2.1.1.3.2 Daedo TKStrike connection

**Daedo connection**

For the connection with Daedo you can select which version to connect to. Currently only version 3.x is active.
You can start the capture at every new fight and have it stopped when the operator confirms the result to the OVR provider.
Ór you can choose to start/stop with every round.
Look at the picture to see how you need to connect TKStrike to the program.
Please note that the connection is going outside of the TP4webserver.

It is a fully separate peer-to-peer connection.

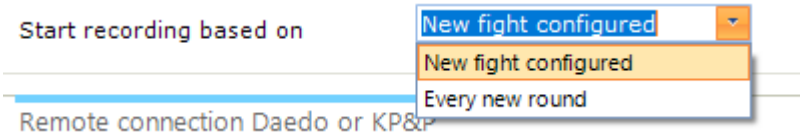



To have Daedo TK Strike start/stop your video replay, set the Daedo TK-Strike connection to Yes.
The TKStrike version needs to be 3.x or higher.

Also select the **port for data communication** to be used. By default it is 8085, but you can select any port as long as it is not blocked by the firewall.
The data communication takes care of starting/stopping the capture for each fight.

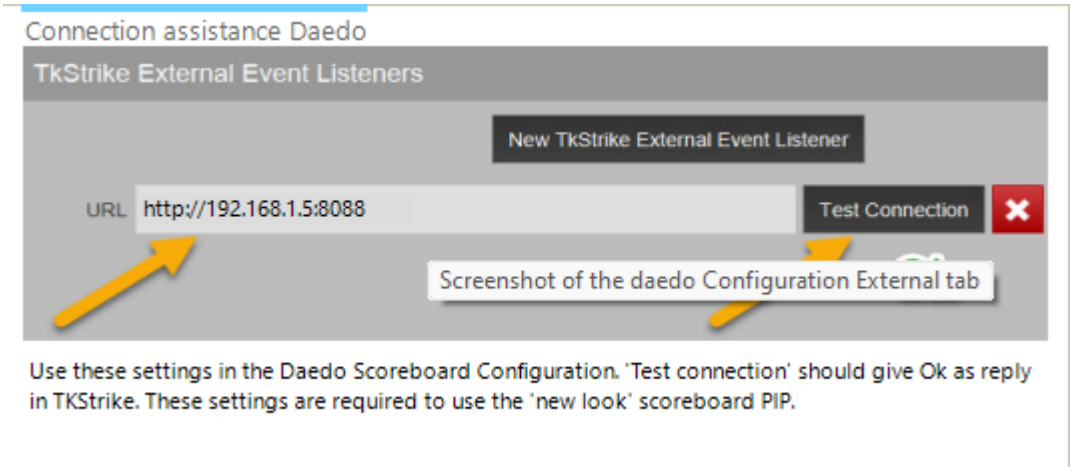
The **port for scoreboard data** is meant to provide the new look scoreboard with data.
Leave it blanc if you do use the internal capture server or no scoreboard at all.

You can start capture as:

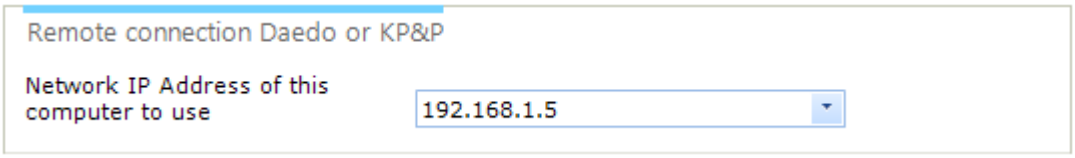



The first option starts the recording as soon as match is loaded in TK-Strike.
The second option starts/stops a recording at every round.

To be able to communicate with Daedo, you need to configure TK-Strike to provide the data:



If you don't know the IP address of your system, check the box:




If you use both data and scoreboard, you need to create two listeners in TKStrike.

If you have more than one connection to a network, you need to select the correct one, to be entered in TK-Strike.
Test the connection in TK-Strike by clicking the TEST Connection button.

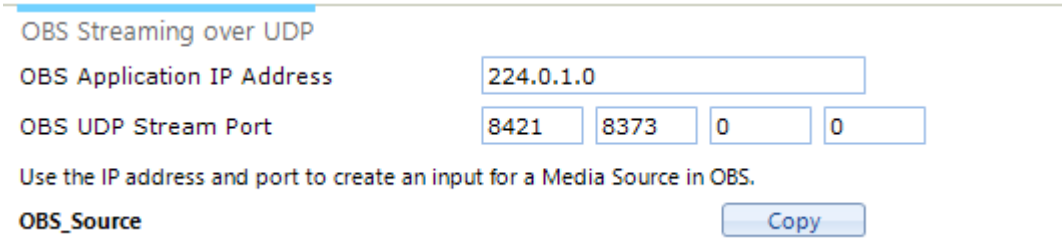
You should receive **Ok** as status.

If not, please check the IP address and port to be correct.

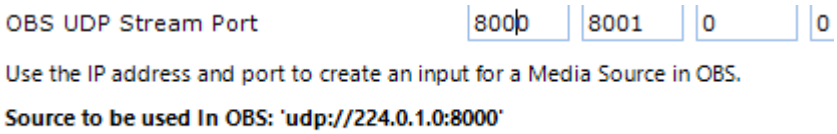
If you see  the Daedo Logo on the mainscreen, it means that you have a connection to the TK-Strike system.

2.1.1.3.3 Providing stream for OBS

The latest version 8.3 provides a new feature to stream directly to OBS or any other tool for streaming to the internet.

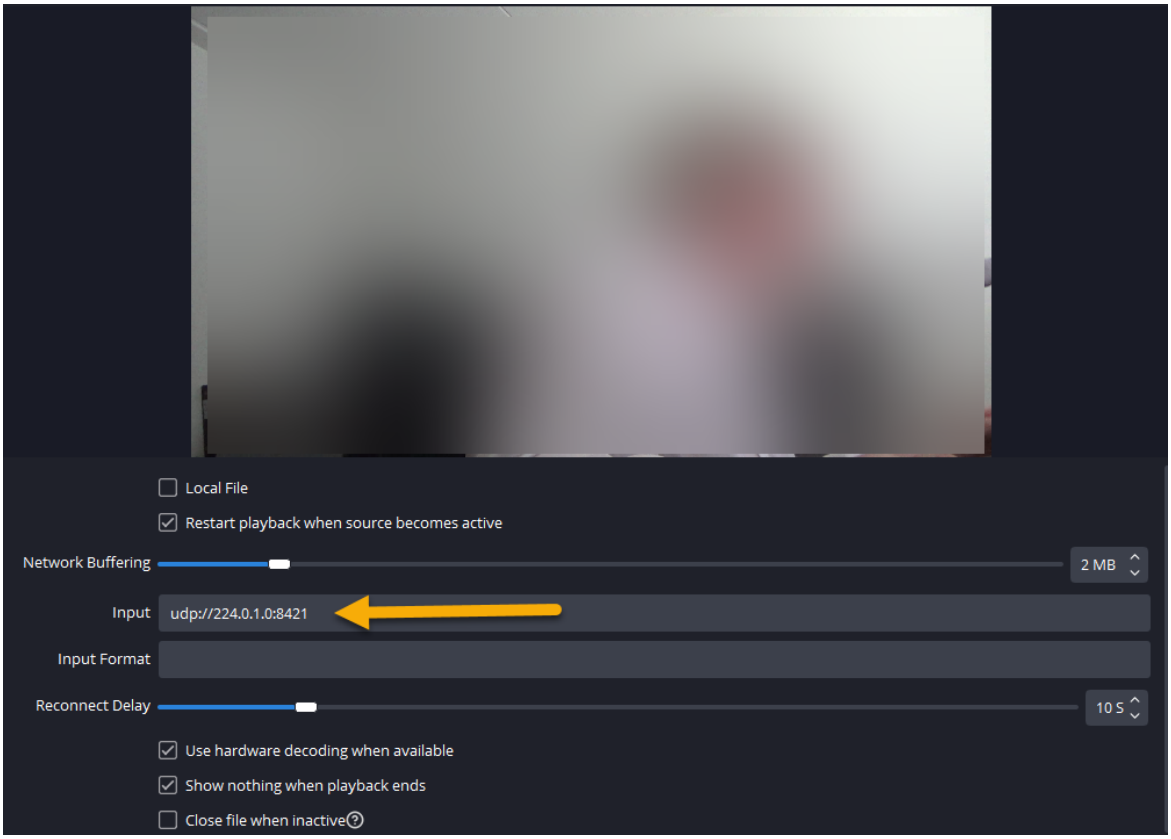



Every connected camera (Directshow or IP) will produce a stream which can be picked up by OBS and processed.
In the connectconfig module you can see the IP address and ports used for each camera.
You can make a nice picture of a single camera, but also mix them in a picturewall.
If you click on a port, the full connectionstring is shown and can be copied by clicking the **Copy** button.




And pasted in OBS.

In OBS you need to add a **Media Source** object:

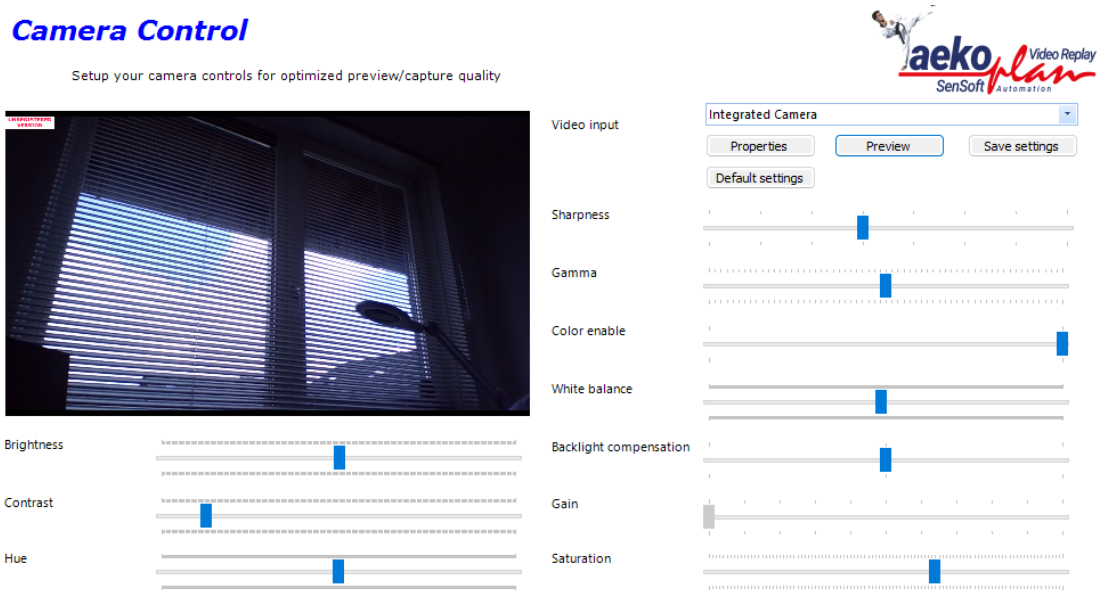



Enter the connectionstring and click on **OK**.

Please note that 224.0.1.0 is a so called **Multicast** IP Address which enables multiple listeners to pick up the stream.
The same stream is for example used in the player to get the live preview.

## 2.1.2 Camera controls

Some camera's (especially webcams) allow for configuration of hue, colour, saturation, contrast etc.

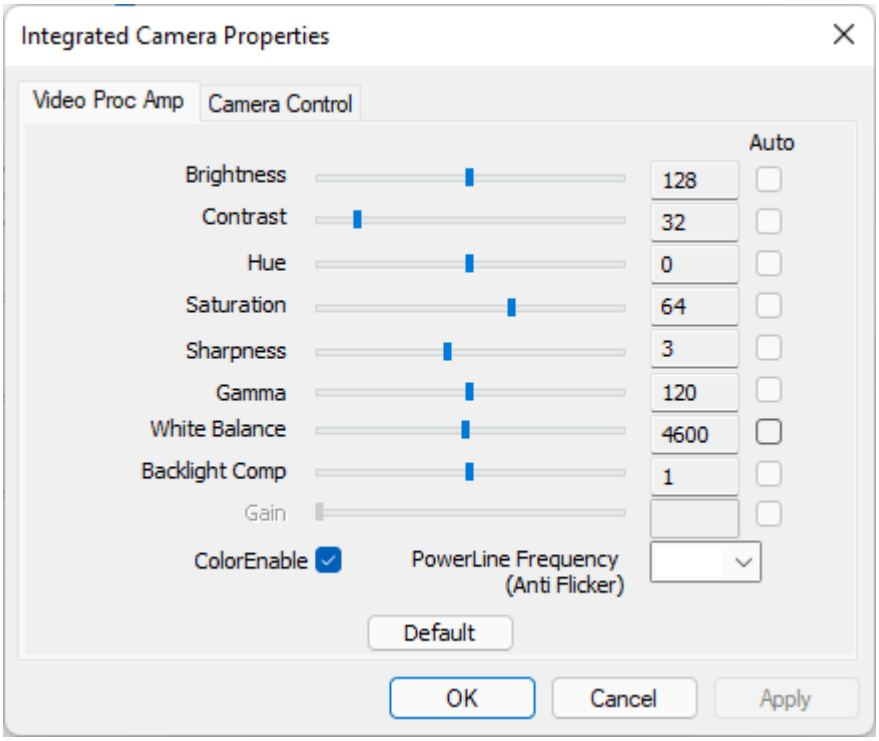



In this module you can adjust several settings for an integrated webcam.
Select the device from the video input pulldown box and click on preview.

In the small black box the preview will be shown. Change your settings and click on **Save settings**. The changes will be reflected in the window immediately.

When capturing with a device that enables camera controls, the device will be configured at the start of the preview according to the settings of the controls.

**Properties** will show the Windows device properties page.

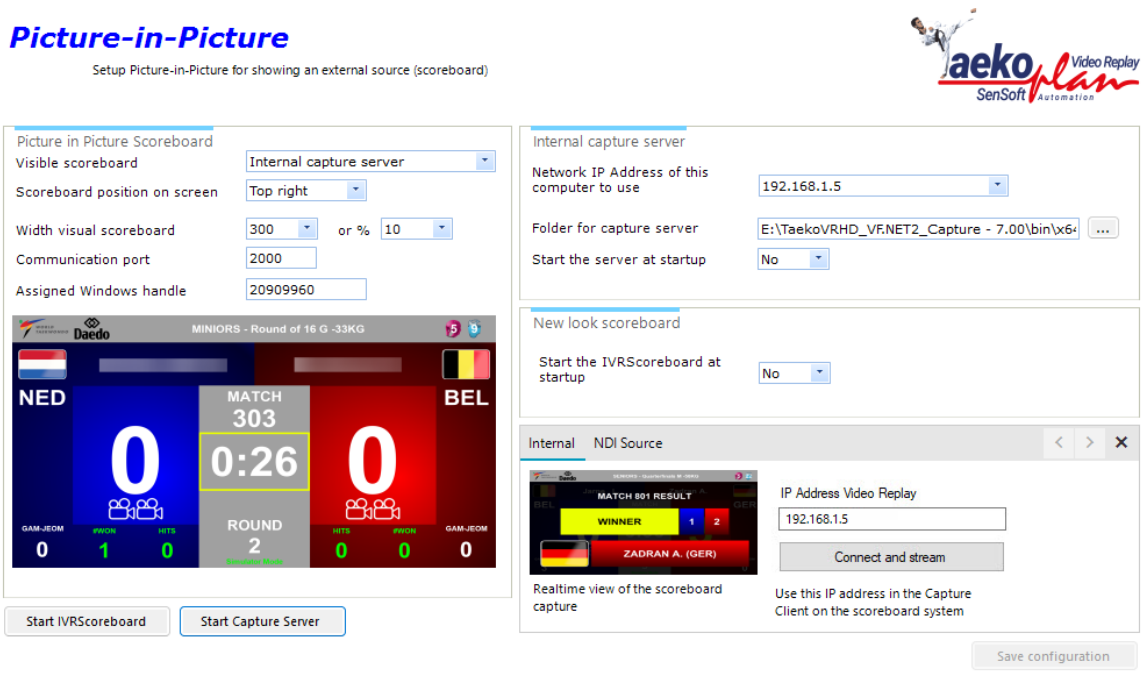


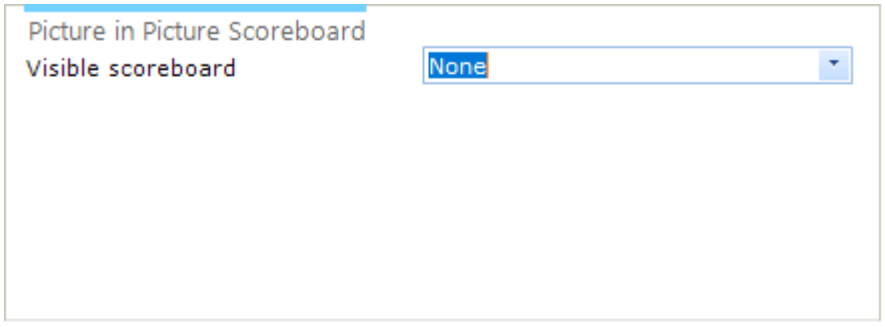

**Default settings** will revert the settings to the factory ones

**Preview** will show the preview of the selected cam

The disabled options (settings) are not available for the selected device.

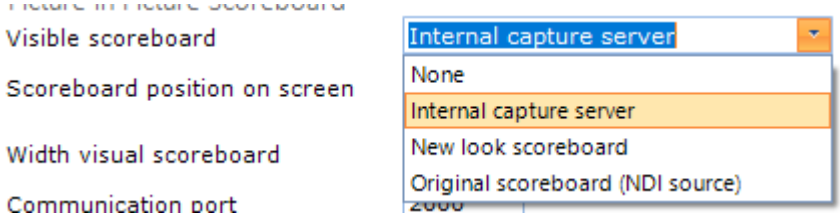
### 2.1.3 Picture-in-picture



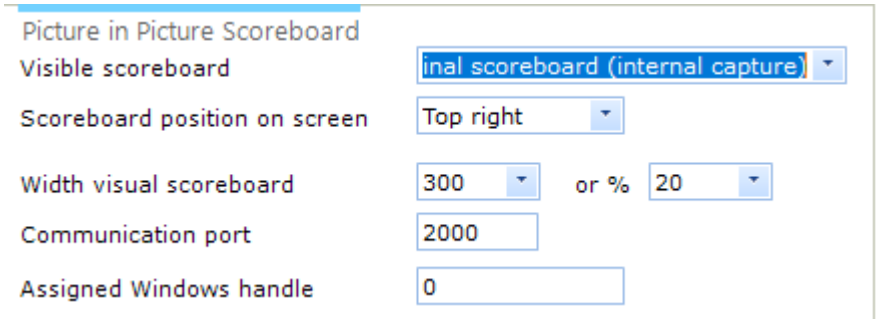

You can position the scoreboard of TK-Strike or KP&P or any any picture in the video replay stream.

Select any of the options in **Visible scoreboard**.



Original scoreboard (internal capture server) 90

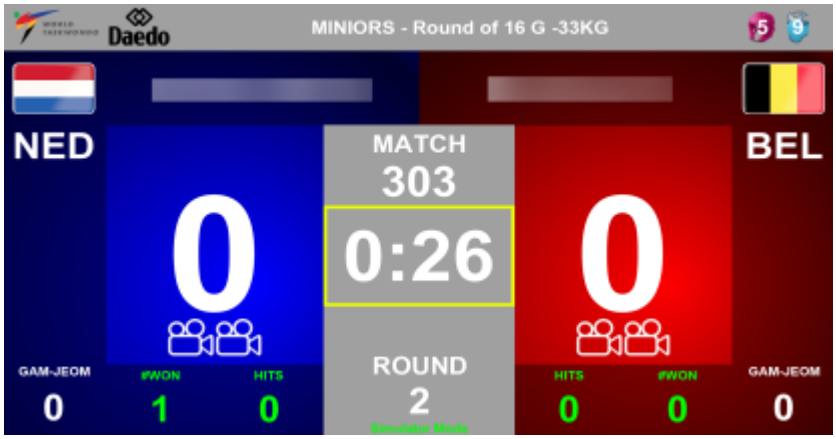
To have this working you need to run the Capture Client on the Daedo laptop and the Capture server on the VR system.
The second screen of Daedo or KP&P will be captured and is visible in the Capture server.




You need to provide the IP address of this system and also select the path for the Capture Server to be found.
Change this only in case you get an error for the server not found.

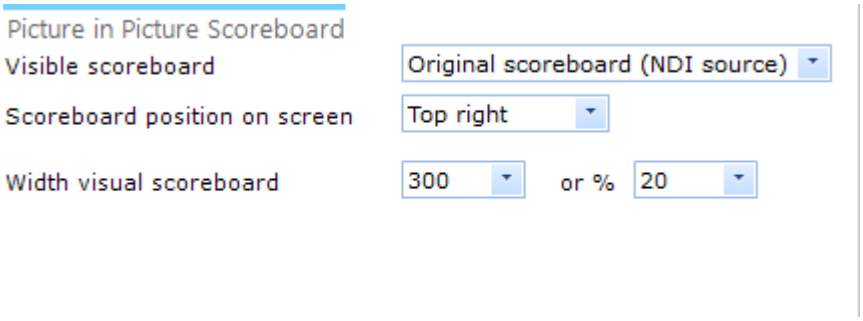

**The server will be recognized by the program and the scoreboard will be available.**

The scoreboard looks like this:



**Original scoreboard (NDI source)**

You can also stream the scoreboard from the Daedo laptop by using vMix tool to the VR laptop.
Every NDI source has a unique name in the network and can be reached from everywhere.
Select this option if you use NDI.





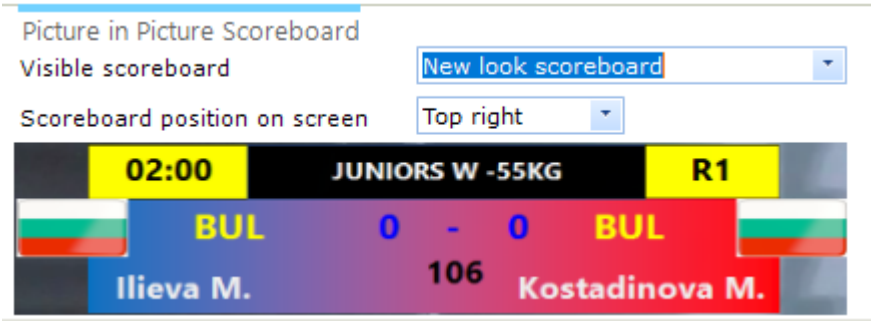
**Click the Search NDI** button to get a list of all NDI sources available.
Selectf one of the sources and you will see a preview.
You do not have to configure NDI any further.

If you want to monitor NDI sources, you can download NDI tools at http://ndi.tv/tools

vMix can be downloaded from https://cdn.vmix.com/download/vMixDesktopCaptureNDI.zip

**New look scoreboard**

You can also use the internal scoreboard, which does not show the original scoreboard but an image based on data coming from the TK-Strike application.



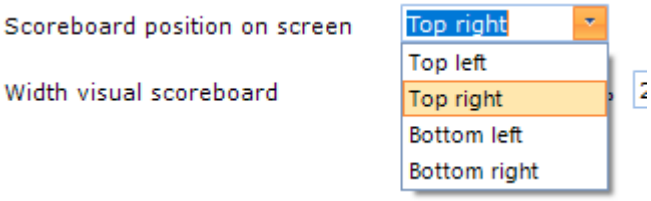

For this scoreboard you need to have the connection to Daedo TKStrike or KP&P working.
**This scoreboard is currently not available with the new version.**

---

**Some additional options to position the scoreboard types**

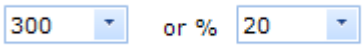
**Scoreboard position on screen**

You can position the PIP in any of the four corners of the picture.



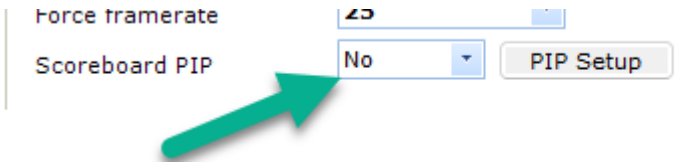

**Width visual scoreboard (internal capture server)**

You can select either a with or a percentage of the screen to be filled. The width does NOT apply to the new look scoreboard which has a fixed width.




For the internal scoreboard through the Capture client/server you need to set the port. By default it is 2000.
The **Assigned Windows handle** shows the ID for the server window. If it is not available, you do not have the server running or it can't be assigned.

To be able to use the PIP feature, you have to set the following parameters in the camera configuration:

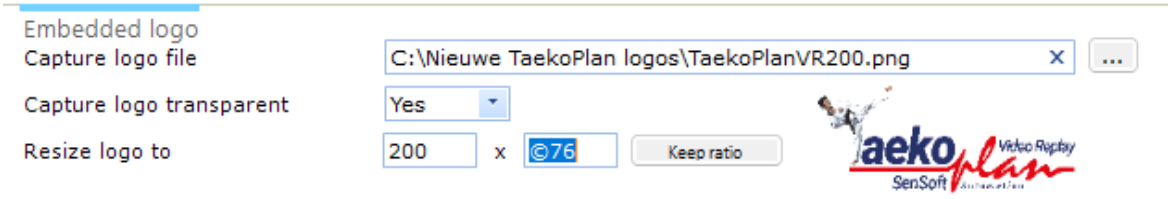



Set it to **Yes** to have PIP in your camera picture.

You can set PIP for every camera used, but please note that it might be CPU intensive, so check the CPU load when using it.

**Add a logo**

You can add a logo to the output. This will by default be positioned in the bottom left corner.




Select the file from your disk.
You can enable transparency by selecting **Yes** in the **Capture logo transparent** box.

By default the logo will be inserted with the original size.
If you want to resize, just enter the new width and height in the boxes.
Click the **Keep ratio** button to maintain the aspect ratio of the image.
If you only fill the new width, and click **keep ratio**, the height will be entered automatically.

**Double-click** on the image to get the original size filled.

## 2.2 Player

This is the playback facility to be used during video replay.


Playback is initiated by either clicking on the Video Replay button, in the capture program to start immediate playback of the current recording, or by selecting a file from the menubar option Open Playback fil 82 or by double clicking on a movie in th filelist.

When playback is running, you see the caption as shown below:

Each playback has it's own timeline, showing the total time of the file.
It will size itself to the available space on the screen.


You can move to any part of the playback by clicking on the timeline, or by holding the mouse button down and moving your mouse.
The screen will be updated immediately.

When you hover over the playback screen, two button bars will show up. respectively on top and bottom.

Below all functions will be explained in depth:

Refreshes the playback file with the latest selection of the main capture file

Click this to go to the live preview of camera 1 if the capture is running. You will see the actual image. Click on **CLOSE LIVE PREVIEW** to go back to the player screen. When you are in live preview and you click refresh, the picture will go back to player mode with the latest footage visible.


Pauses the current playback. It will change to


so you can resume playback.


Clicking this one will move the playback one second reverse.


Clicking this one will move the playback one second forward


Clicking this will move the playback one frame forward


Clicking this will move the playback one frame backwards

Activate slow motion mode. Clicking again will switch back.

**Zoom in/out:**

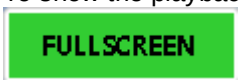
You also have the option to zoom in and out on the playback


You can zoom in by using the mousewheel (up or down is zoom in or out).
You can also use the + and - keys or the scrollbar on the right of the playback screen.
During zoom you can scroll the picture to all directions by clicking the left mouse button, holding it down and moving it.
The selected zoom will be maintained even when playing the file normally.

Click here top go to fullscreen mode.

Click RESET to reset the zoom, if applied, or reset the slow motion, if activated, The picture will go back to initial settings.

Important: Zooming in does not always provide better quality picture. It will be less good than the orginal.
To show the playback fullscreen, just double click on the current screen or click on





To return to normal mode, double click the fullscreen playback or click **Normal view**

For all screens it is important to know that the screen aspect ratio is always maintained. So the available size decides the width and height for the playback.

**Synchronized recording/playback**

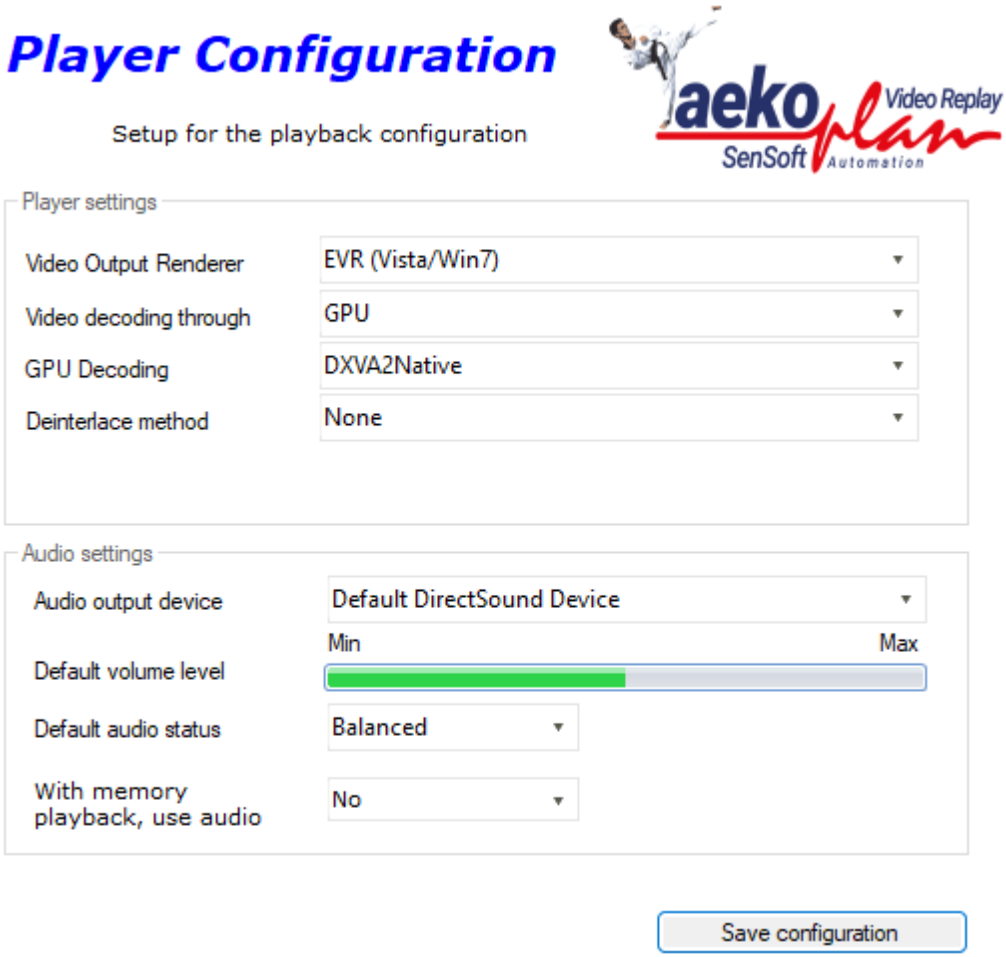
When you have used synchronized recording with two cams, you can switch between the two cams by clicking the blue Cam buttons on top of the playback screen.
The active cam will become red during playback. The cams resume where the other one was switched.

### 2.2.1 Player Configuration

Enter topic text here.

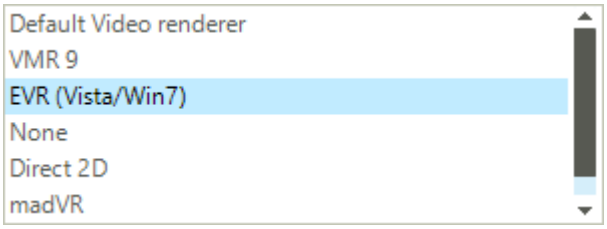
### 2.2.1.1 Player config

The player configuration defines settings for the playback option.




#### Video output renderer

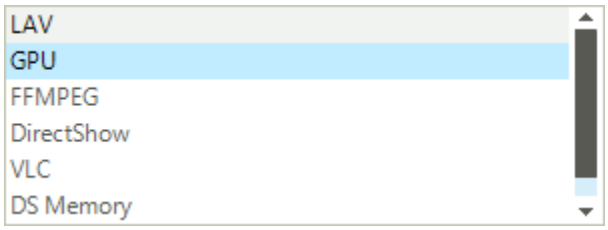
The renderer used by Windows to show the picture. Select the one that is giving the best output for your system.




EVR/Vista is the best renderer (quality), VMR9 the fastest.
MadVR is a third party, experimental renderer.

**Video decoding through**

If you need to use a specific codec to play the file, you can force the program to use this one. provide the name as registered in Windows.



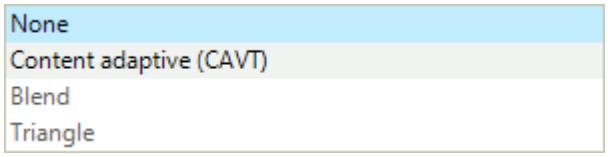

The most common decoder to use is LAV. That uses CPU load. If you have a modern graphics card you may also use GPU as option.

If so you have the following options:


AMD processors do not support Intel Quicksync, so you need to go for any of the other options.

**Deinterlace method**

If your MP4 movie is interlaced, you need to de-inter;ace it.
You can that by using any of the three options:

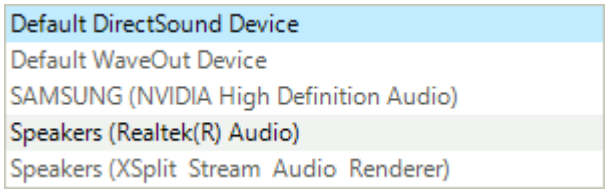



**Audio settings**

The following audio settings ara available. Most of the time the MP4 movie might be without sound, but if captured with sound, you can set the audio parameters

**Audio output device**

Select the output device from your system to be used for the audio of your playback file




These are examples from a system; your setup might be different. **Default Directsound Device** is a standard Windows output device for audio and is available on any Windows system.

**Default volume level**

Select the default volume level for the output of the audio. Use the slider to select a level from 0 (no sound) to 100 (full sound)

**Default audio status**

This selects either sound or no sound (mute) as default setting

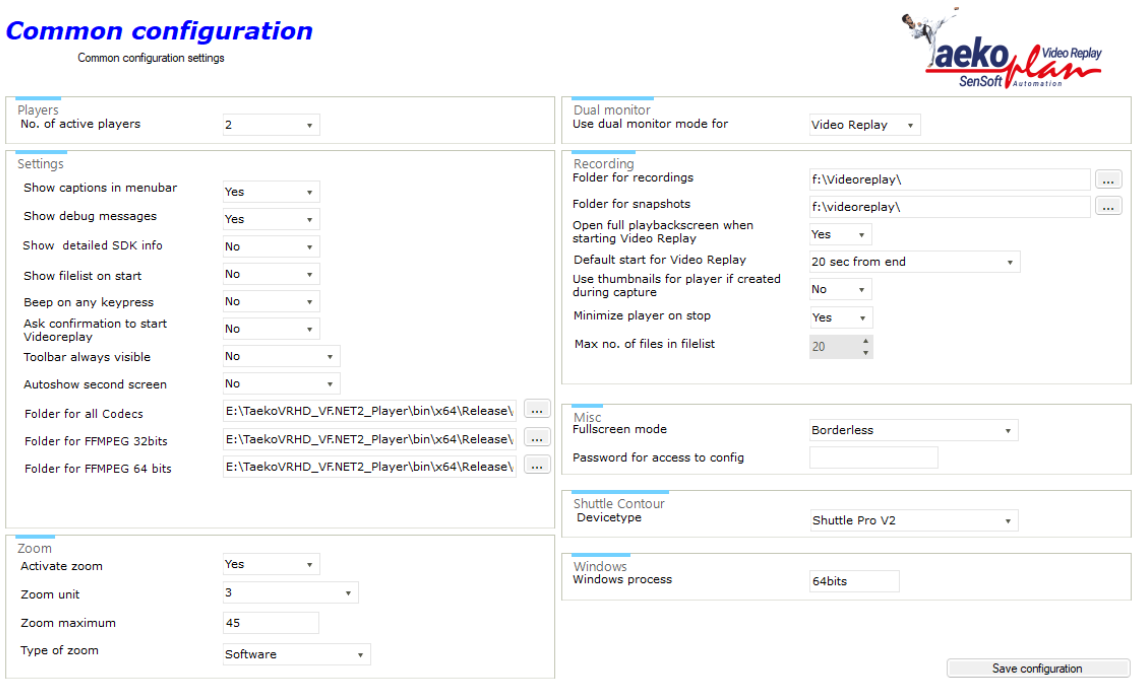
**With memory playback, use audio**

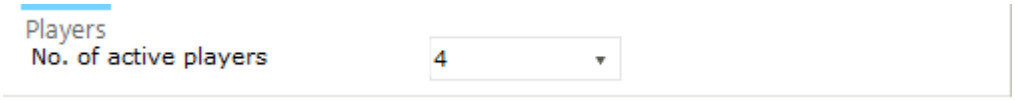
When you have selected memory playback (load the whole movie in memory before starting the playback), you may choose to use audio or not.

Use the **Save configuration** button to save your changes.

### 2.2.1.2 Common config

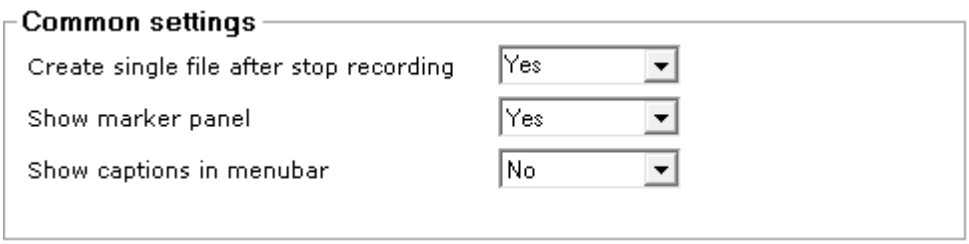
The common configuration contains settings that define specific user requirements.




Select the number of active players here. You can choose from 1 upto 4.

The common configuration has four sections:

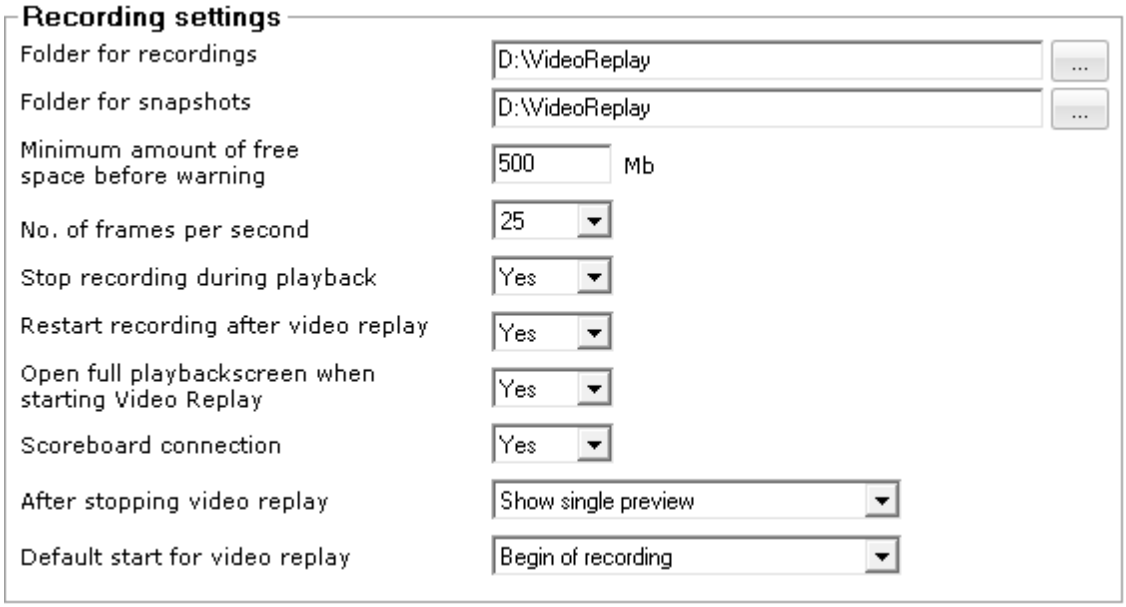


**Create single file after stop recording** This will compress all separate recordings from the same fight into one complete file. The markers are also merged into one file, timestamps within the separate recordings are being updated in the final output file, so the markers will go to the correct point in the output file.

**Show marker panel** This will show or not show the marker panel on the capture screen.

**Show captions in menubar**


This will switch the captions in the menubar. If you select **No** then no captions will be shown and the toolbar will be smaller. This will suit lower resolution screens.




**Folder for recordings** This is the folder where the recordings will be stored.
In the folder a datestamp is applied by the software to distinguish between the days.

**Folder for snapshots** This is the folder where the snapshots will be stored.

**Minimum amount of free space before warning** This is the limit under which a marker will be shown during recording which shows the remaining disk space.

**No. of frames per second** Select the no. of frames per second for the capture. The more frames, the better the playback will be able to show actions.

**Stop recording during playback** Shows only the preview while playing back the last scenes that were captured

**Restart recording after video replay** After video replay is finished and the stop button is clicked, the preview will continue recording. The output will be stored in a new file on disk.

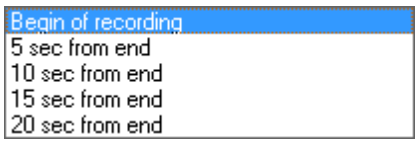
**Open full playbackscreen when starting Video Replay** After clicking the Video Replay button, the playback will open fullscreen instead of embedded.

**Scoreboard connection** If yes, then data from the Budoscore scoreboard system (if connected) will be provided in the footage

**After stopping Video Replay**


**Select one of the three options from this pulldown.**

**Default start for Video Replay**




**After selecting Video Replay, the footage will start at the selected point in time.**


**Use Dual monitor mode**

You have the following choices here:


**None: No dual monitor enabled**
**Preview: shows only the preview screen on a second monitor**
**Video Replay: show the Video Replay screen on a second monitor**
**All modes: shows all (preview/record and video replay) on the second screen**

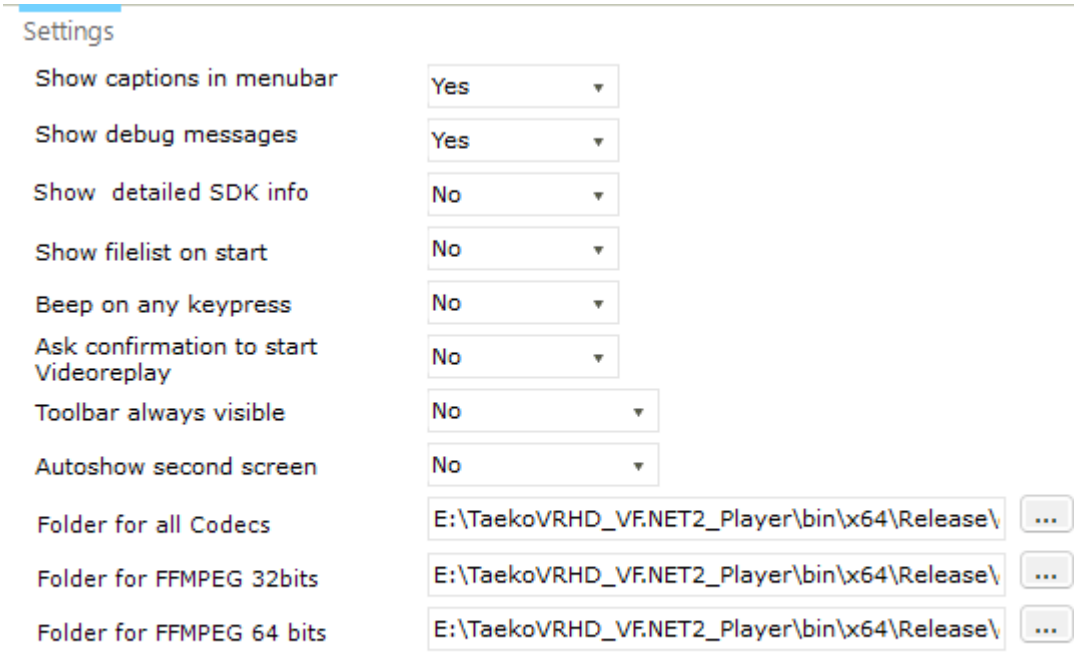

**Zoom unit**

Select the zoom steps for zoom in or out

**Zoom maximum**

The maximum range for zoom. Please note that the quality for zoom is highly depending on the quality of the recording.
High definition recording provides the best possible zoom range.

2.2.1.2.1 Settings




The following settings can be changed:

**Show captions in menubar**

Set this to Yes to display the text captions in the menubar of the program.
Setting No will only show the icons

**Show debug messages**

Set this to Yes to show all messages, including errors.

**Show filelist on start**

Set this to Yes to show the list of files captured today and playable on thr right side of the screen.

**Beep on any keypress**

Set this to Yes to hear s system beep when a key is pressed. This might be useful if you are in doubt whether a keypress reaches the program

**Ask confirmation to start videoreplay**

Set to Yes to confirm a choice of starting an available video replay file. If you say No the file will be played instantly

**Toolbar always visible**

Set to Yes to have the toolbar for the player (start, stop, zoom etc) always visible. If No it is will only show when you enter the videoview with the mouse

**Autoshow second screen**

Set to Yes to start the second screen instantly when starting the playback of the movie. If not you can show it manually.

**Folder for all codecs**

This is the folder where the codecs are stored. By default it is the Codecs/redist folder in the installation. You can change it to any folder.
You need to have valid and correctly installed codec and filters in that folder.

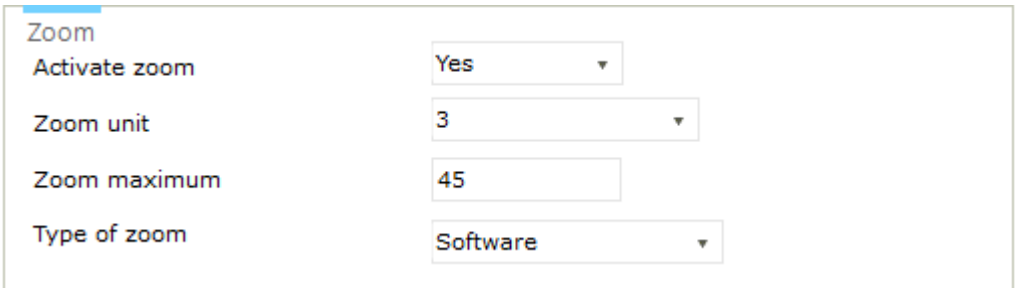
**Folder for FFMPEG 32bits**

This is the folder where the FFMPEG 32bits apps are stored. By default it is the Codecs/redist/FFMPEG/win32 folder in the installation. You can change it to any folder.

**Folder for FFMPEG 64bits**

This is the folder where the FFMPEG 64bits apps are stored. By default it is the Codecs/redist/FFMPEG/win64 folder in the installation. You can change it to any folder

2.2.1.2.2 Zoom




During playback you can zoom in and zoom out on the movie.

**Activate zoom**

Set this to Yes to have the zoom available. This is the default setting

**Zoom unit**

This is the step for each zoom tick. The higher, the faster the zoom be. A smaller step increases the zoom ratio only a little each time, which will take longer to get to a full or required zoom state.

**Zoom maximum**

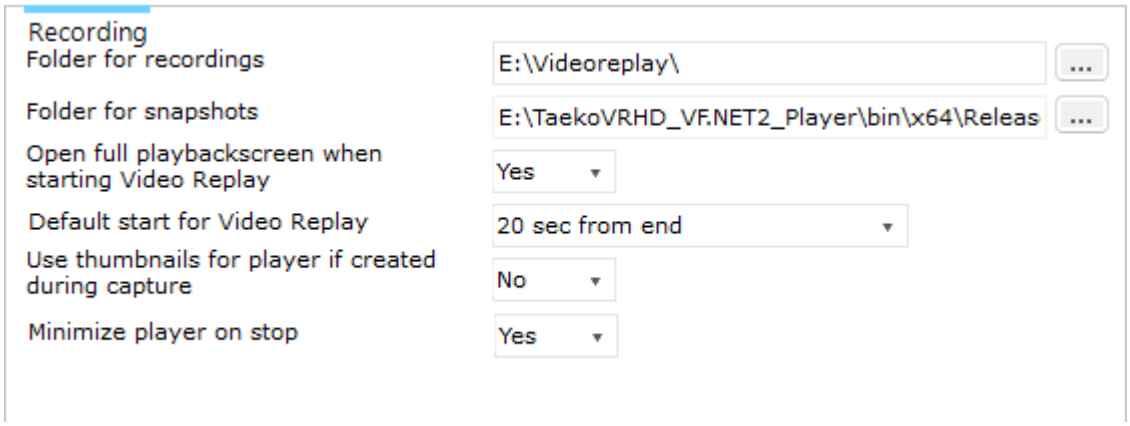
This is the limit for the zoom (based on the steps)

**Type of zoom**

There are two possible zoom options available.

Software zoom is fully software and is the best regarding smoothness while zooming in or out. Hardware zoom uses the GPU but is not that smooth. It will sometimes show a black screen inbetween.

2.2.1.2.3 Recording




**Folder for recordings**

This is the folder where the movies for today are stored. This is the folder as set in the capture module.

**Folder for snapshots**

You can make a snapshots while playing and store the snapshots in a folder. Select here the folder where to store them

**Open full playbackscreen when starting video replay**

Set to Yes to start the player in fullscreen mode. if No you will get the normal docking interface.

**Default start for video replay**

This is the position where any video replay playback will start. You can select different options here.

**Use thumbnails for player if created during capture**

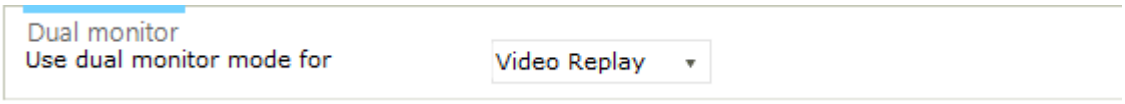
If you have created thumbnails each second for the file, and you set this to Yes, then thumbnails will be visible when scrolling through the file.

**Minimize player on stop**

When set to Yes, the player will go to minimized window state as soon as you press the **Stop** button.

#### 2.2.1.2.4 Misc

Here are some other options that can be set:




You can set this to either **None** or **Video Replay**


**Fullscreen mode**

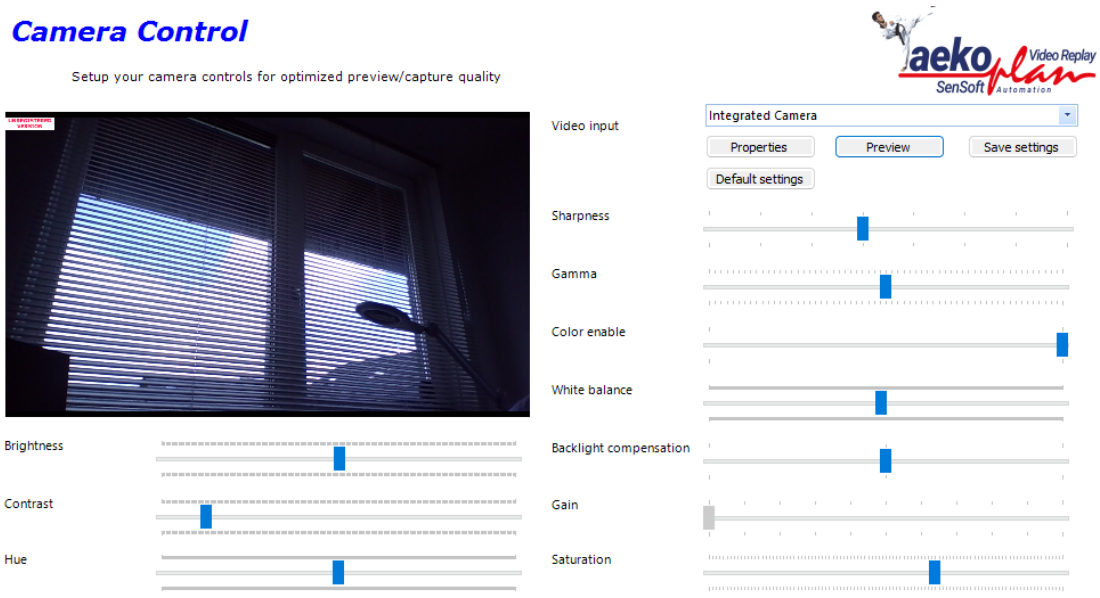
You can select to have the fullscreen either borderless or with a standard windows border around it. The first one can't be moved, the second one can be resized.

**Password for access config**

Set here a password to secure access to some modules, like player config, common config or camera controls.

### 2.2.1.3 Camera controls

Some camera's (especially webcams) allow for configuration of hue, colour, saturation, contrast etc.

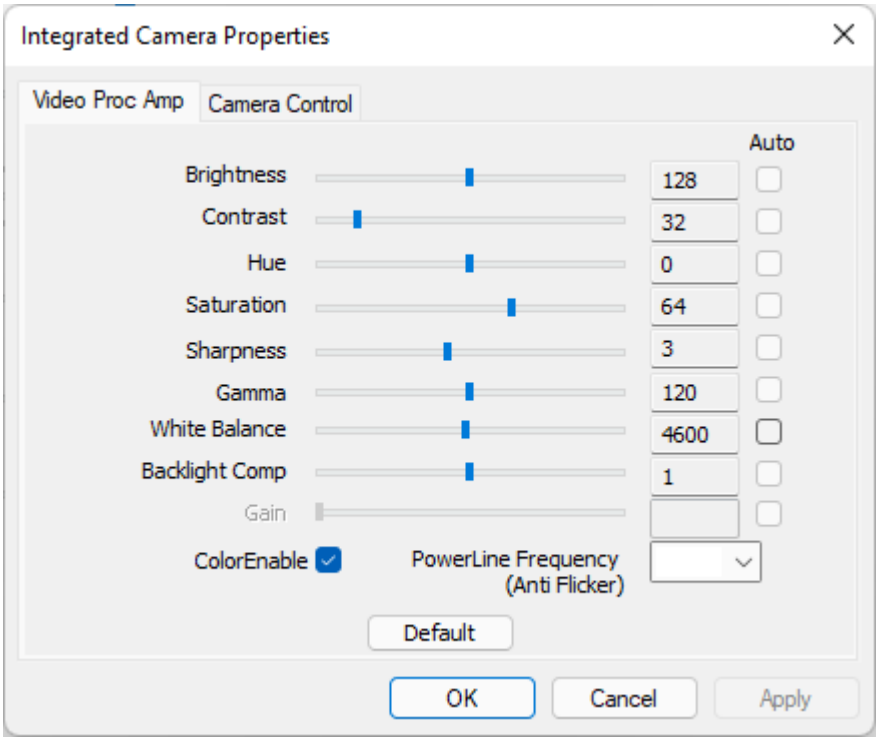



In this module you can adjust several settings for an integrated webcam.
Select the device from the video input pulldown box and click on preview.

In the small black box the preview will be shown. Change your settings and click on **Save settings**.
The changes will be reflected in the window immediately.

When capturing with a device that enables camera controls, the device will be configured at the start of the preview or capture according to the settings of the controls.

**Properties** will show the Windows device properties page.



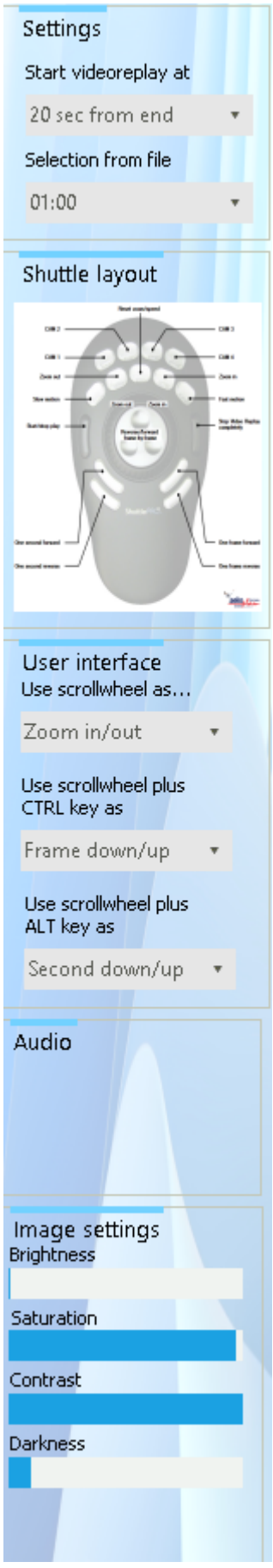

**Default settings** will revert the settings to the factory ones

**Preview** will show the preview of the selected cam

The disabled options (settings) are not available for the selected device.

#### 2.2.1.4 Playback options

On the left side of the screen you can see a dock with playback options.



**Start videoreplay at**

This option can be set to a default in the common config, but here you can set it (and change it) on the fly.

**Selection from file**

Here you select the length of the file to be reviewed. You can select a short time period as well as the whole file.
if you select a shorter period, the file will be created. Only that specific part of the file will then be available for watching.
The created 'Part' file will be removed automatically from disk after 30 minutes to save space.

**Shuttle layout**

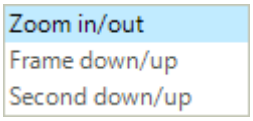
Click here to get the full view of the Shuttle Pro v2 layout as being used

**Image settings**

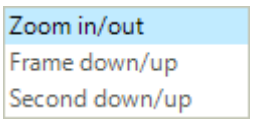
Here you can change the brightness, saturation, contrast and darkness for the currently visible movie.

**User interface**

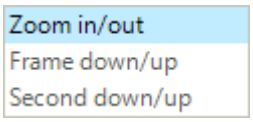
Use scrollwheel as...




Use scrollwheel plus CTRL-key as...




Use scrollwheel plus ALT-key as...



### 2.2.2 Filelist

In the menubar you can click on Filelist to show the filelist on the right side of the screen. You can also set the option in the common config.

The first movie in the list is always the active capture. You can open this one for review..

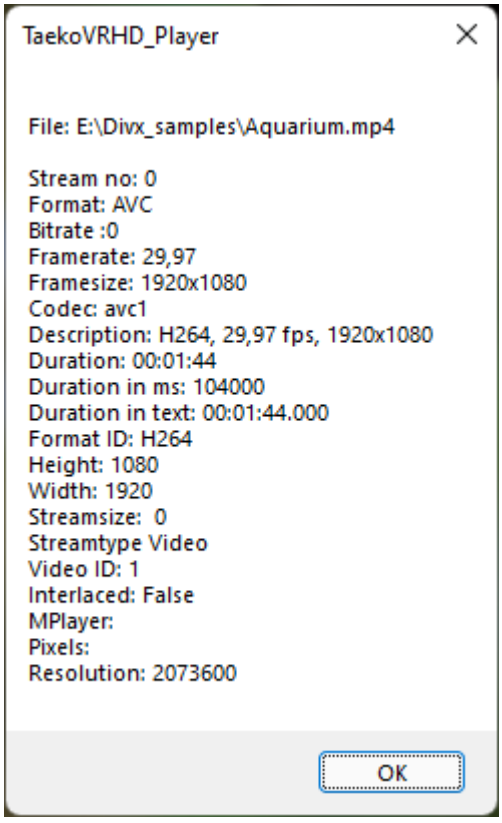
The other ones are the finished ones. If you see a sample image, you can open the file by double click on it.
The fightnumber is shown as well as the time of capture start and between brackets, the camera number.

Doubleclick a movie to show it in the mainscreen.

### 2.2.3 Fileinfo

For each playback file you can check the file info.
This gives an overview of the length, used format, audio streams etc.

It is quite technical, but if you are interested you may look at it.




# Part II

# 3 Appendix

This section contains additional information about TaekoPlan Video replay

# 3.1 Menubar options

## 3.1.1 Capture

After the start of the program, a menubar shows up at the top of the screen. This will be adapted continuously depending on the selected item.


The buttons have the following meaning:

**Now: separate recording**

This shows the way of recording. Now: Separate recording means that all cams can be individually selected and navigated.
Now: synchron recording means that by starting for example a recording on cam 1, cam 2 and more if selected will also start recording

**Fightnumber**

Shows the fightnumber entry form to be able to enter a fightnumber for the next recording

**Snapshot**

Creates a snapshot of the active preview(s) in the folder as configured in the common configuration

**Original**

This shows the preview in original format, without resizing it

**VR Configuration**

This option has a submenu to start the different configuration screens.

**Merge files**

This option allows to merge more files of the same fightnumber together into one file.

**Debug**

Has a submenu with some additional options

**Register**

This shows the registration screen for the license

**Program help**

This shows the PDF helpfile as available for the program

**About...**

This shows the About... form

**End program**

Ends the program, releases all resources.

## 3.1.2 Player

After the start of the program, a menubar shows up at the top of the screen. This will be adapted continuously depending on the selected item.


**Now: Synchron playback**

This shows the way of playback. Now: Separate playback means that all cams can be individually selected and navigated.
Now: synchron playback means that by starting for example a playback of cam 1, cam 2 and more if selected will also start playback.

**Open playback file**

Select the file for playback. You can actually play any file or any format.

**Delete file**

Delete the currently selected file from the library. It will also be removed from disk

**Snapshot playback**

Creates a snapshot of the active preview(s) in the folder as configured in the common configuration

**File list**

This will show the file list on the right side of the main screen. You can select any file by double clicking on it.

**Media info**

This will show a form with technical details about the file currently playing

**VR Configuration**

This option has a submenu to start the different configuration screens.

**Merge files**

This option allows to merge more files of the same fightnumber together into one file.

**Debug**

Has a submenu with some additional options

**Register**

This shows the registration screen for the license

**Program help**

This shows the PDF helpfile as available for the program

**About...**

This shows the About... form

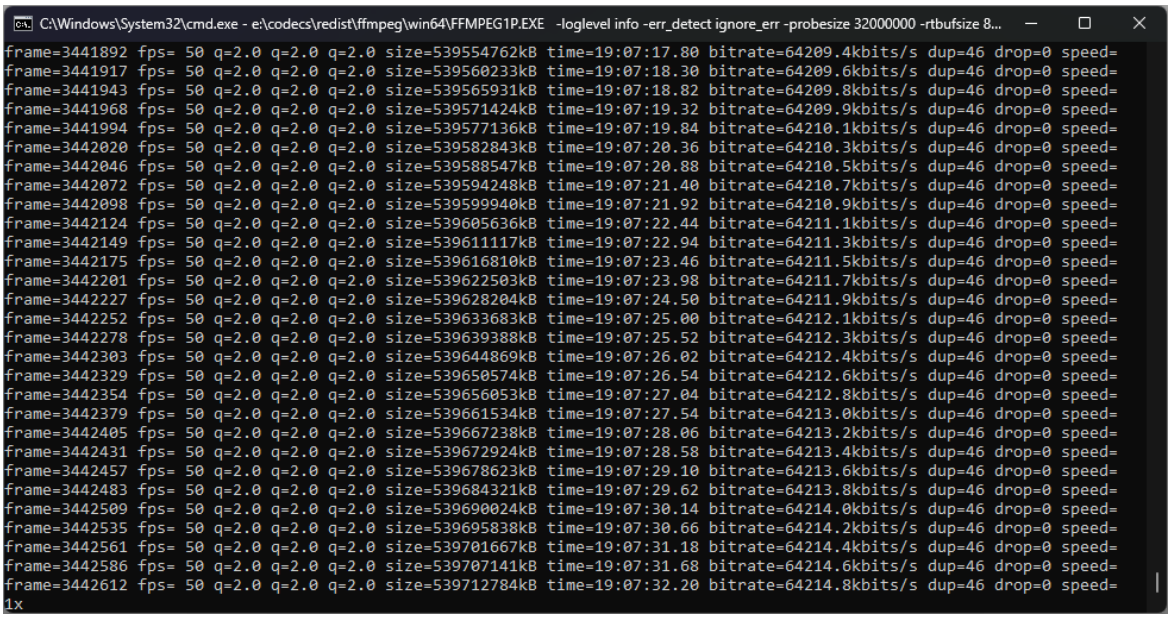
**End program**

Ends the program, releases all resources.

## 3.2 FFMPEG commandboxes visible

The capture program is using FFMPEG to capture the incoming videostreams from the devices.

You may see a box like this:




If you see it and do not want to see it, you can either minimize it or you can complete hide it by setting:


Show terminal window to 'No' or to 'Yes, minimized'.

The window actually shows the progress of the capture.

In the picture shows:

| | |
|---|---|
| Frame=.... | Number of frames processed |
| fps=... | frames per second (50fps, connected to a Sony camcorder and a Camlink 4K device) |
| q=... | Quality factor of the capture (2 is almost the best) |
| size... | Size of the capture output on disk |
| time=... | Length of the recording (here more than 19 hours) |
| bitrate=... | Bitrate used to encode the videostream |
| dup=... | Number of duplicate frames (only 46 on more than 3M frames) |
| drop=... | Number of dropped frames |

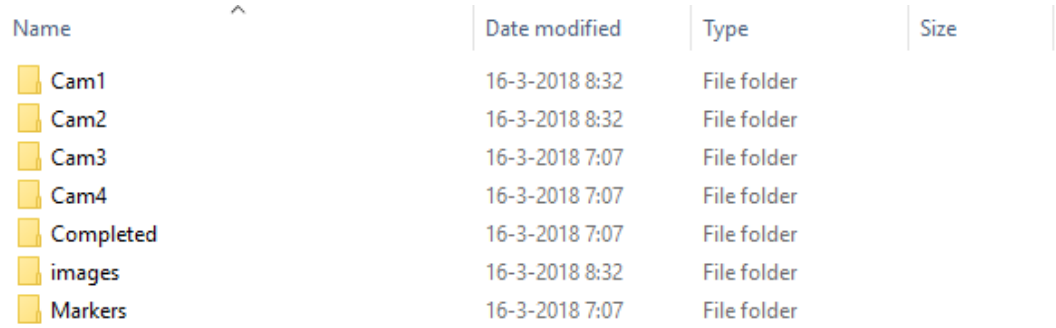
Speed=... Encoding speed (should be 1 for errorless encoding. Lower value means that the laptop can't keep up with the incoming videostream)

You will see one commandbox for preview and one for capture for each connected camera.

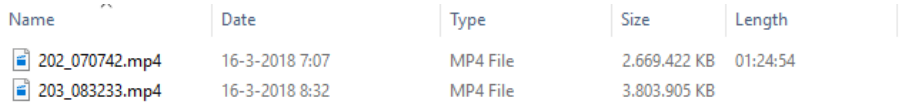
## 3.3 Playback files

The recordings are being stored in the path set in the common config.

The directory structure created looks as following:




In the folders Cam1, Cam2, Cam3 and Cam4 are the recordings saved.




All recordings have the same format for naming.

The first digits upto the first underscore are containing the **fight** no.

Next a **timestamp** is inserted showing hours, minutes and seconds.

When playback is started, the program automatically identifies that one or two cams are being used. The option to switch between them is enabled in the player.

## 3.4 Requirements

The following requirements apply to create a decent system for video replay.

**Notebook:**

- I7 CPU 10th Gen. (especially for HD and dualcam)
- At least 8 Gb memory
- HD/SSD with at least 1 TB
- Videocard with at least Full HD (1920x1080) resolution (Nvidia or Radeon, Nvidia preferred)
- At least 2 USB-3 ports (separate Root Hubs) to connect two HDMI camera's
- Network port to connect IP camera Peer-to-peer
- Network connection to access remote camera's

**Camera:**

- Full HD directshow camera (Sony, Panasonic etc)
- 4K compatible camera
- Devices for HDMI input (Camlink, USB-Video)
- IP camera with wired or wireless connection

Each device that is recognized by Windows as camera device can be used and connected. The recognized devices will show up in the device list in the camera config 15.

## 3.5 Video transfer notes

Please note that the right equipment 83 is required to properly use the video replay system.
Besides the equipment recommended, there are some important extra requirements that you need to take note of.

### Cabling

Please don't think any cabling should work!

We can advice you to use high quality cable, especially if you are going to transfer over longer distances.


### Firewire

If you are using firewire connection on both camera and computer, never use cabling consisting of firewire to USB and USB to firewire.
This will **not** work!
If you connect the device and Windows does not immediately show up with a message saying **Installing device....** then this connection is not working.


### USB

If you are using USB connection on the camera and USB connection on the computer, please first check that the camera is capable of **USB streaming**.
When you connect your device and the computer is trying to install it as mass storage device or in terms like that, then the computer is only capable to use the storage on your camera.
Windows should start installing the device as **imaging** device.
If this is not working, then check whether the camera is capable of doing **USB streaming**.
You should find this information on the camera (on a label) or in the manual.
Camera without streaming capabilities can not be used for Video replay.


**HDMI**

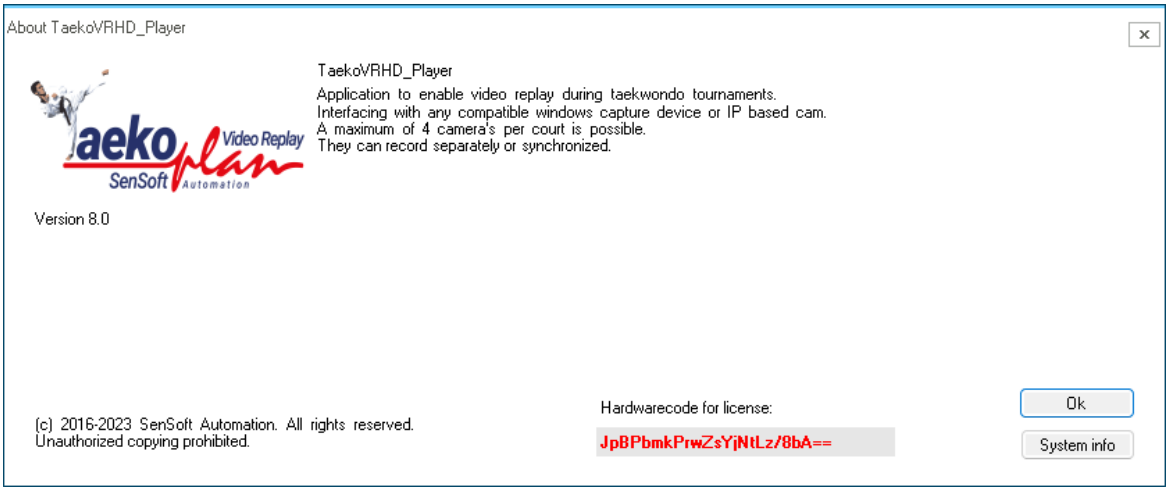
Most modern camera's provide HDMI output which can be transferred using for example a CamLink or USB-Video device to a USB-3 port on your computer.
You can NOT connect camera HDMI output to HDMI port on a laptop!

**So to be short:**

**- Use a camera with firewire, USB streaming or HDMI capability or use an IP camera over cabled network**
**- Use HQ cabling for firewire, USB and HDMI**
**- Never use adapters from firewire to USB and vice versa.**
**- Check proper installation under Windows for the device.**
**- Only devices recognized and installed under Windows can be used for Video replay.**

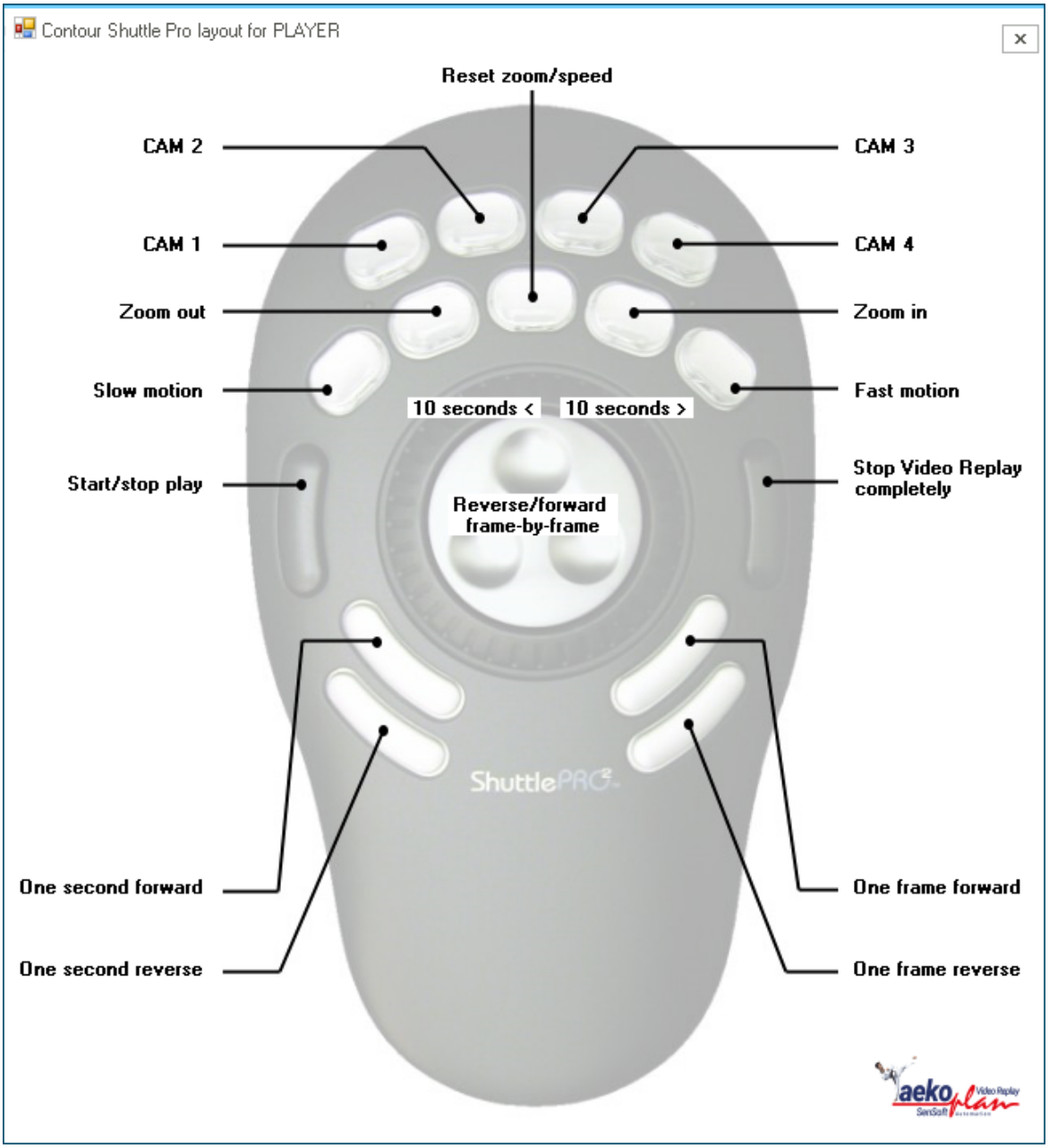
## 3.6 About

The about box shows program information.



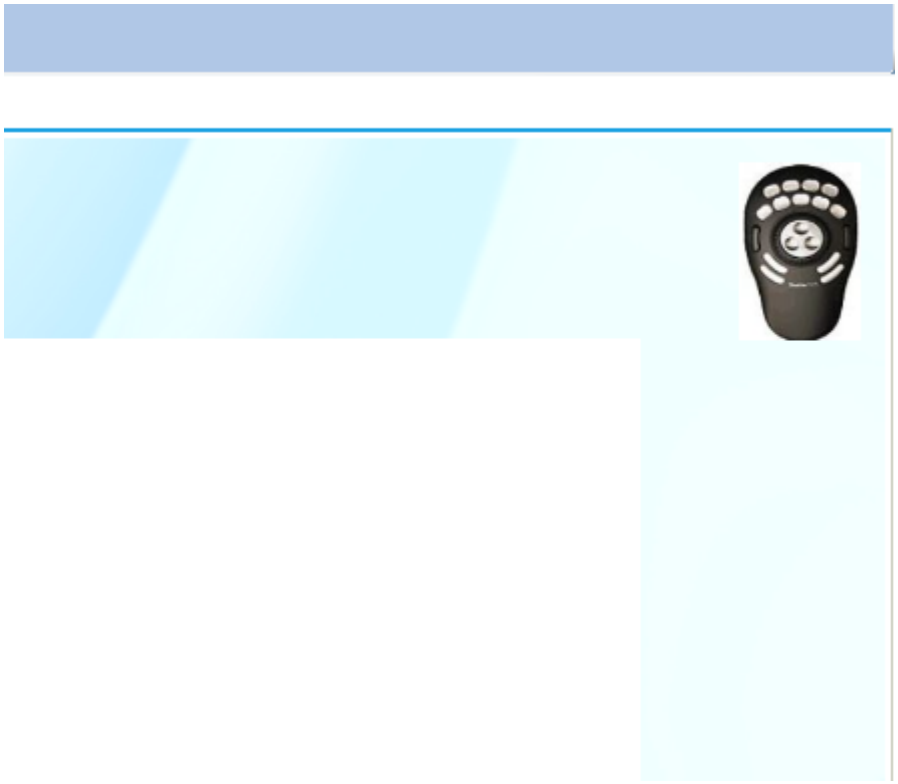
## 3.7 Contour Shuttle

You can use a Contour Shuttle to navigate your playback:

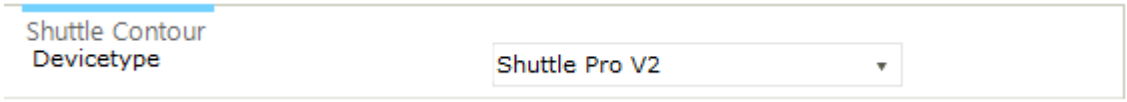


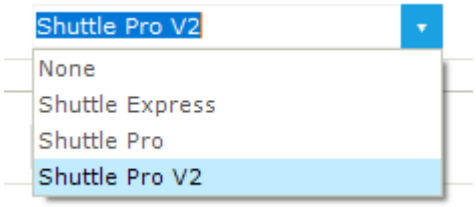

All basic functions are available.

When the shuttle is enabled in the software, you see the shuttle icon in the top right corner:



Select the Shuttle type you are using in the common configuration module:




You can use any of three types. The ProV2 has the most extensive set of functions available.

## 3.8 H264 Encoder bitrates

You might need to experiment with bitrates to get the best result for your capture.

Suggested bitrates for different video resolutions with H.264 Encoding

| | Resolution | Suggested Bitrate |
|---|---|---|
| 480P | 720 x 480 | 1800 kbps |
| 720P | 1280 x 720 | 3500 kbps |
| 1080P | 1920 x 1080 | 8500 kbps |

Suggested bitrate settings for mobile phones with different resolution

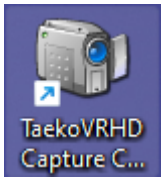
| | 192 x 144 | 320 x 240 | 480 x 360 | 640 x 480 | 1280 x 720 | 1920 x 1080 |
|---|---|---|---|---|---|---|
| Ultra low bitrate | 30 kbps | 60 kbps | 120 kbps | 250 kbps | 500 kbps | 1 Mbps |
| Low bitrate | 60 kbps | 120 kbps | 250 kbps | 500 kbps | 1 Mbps | 2 Mbps |
| Medium bitrate | 120 kbps | 250 kbps | 500 kbps | 1 Mbps | 2 Mbps | 4 Mbps |
| High bitrate | 250 kbps | 500 kbps | 1 Mbps | 2 Mbps | 4 Mbps | 8 Mbps |
| Ultra high bitrate | 500 kbps | 1 Mbps | 2 Mbps | 4 Mbps | 8 Mbps | 16 Mbps |

The higher the bitrate, the more load on the CPU/GPU.

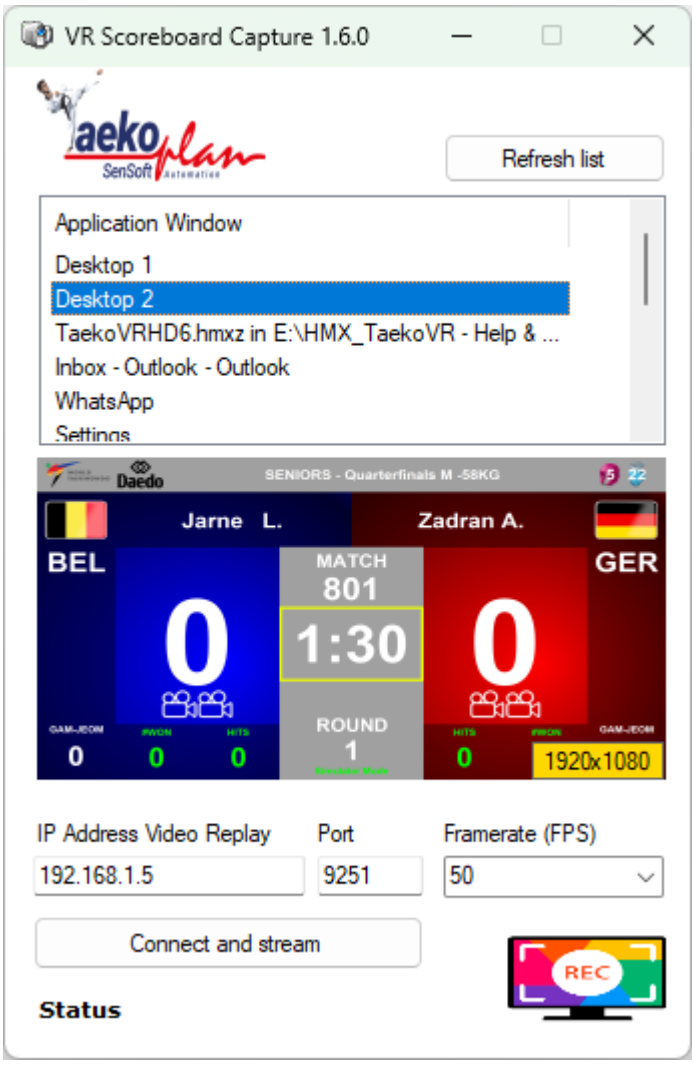
## 3.9 Capture Client/server

To use Picture-in-picture you can use the Capture client/server tools provided.

### TaekoVRHD Capture client application




Start the TaekoVRHD Capture client application:

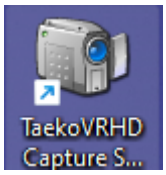



Select the application window you want to capture. The client is running on the scoreboard laptop and NOT on your IVR laptop!

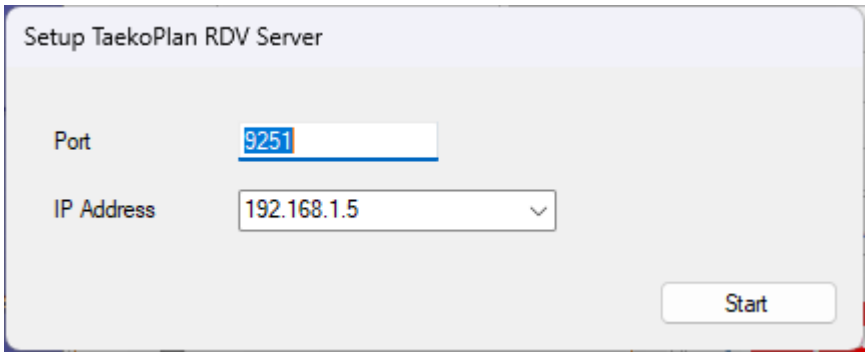
Enter the IP address of your IVR laptop in the ÍP Address Video Replay' textbox and the port to be used. This may be any port.
Set the framerate to a value which is sufficient for the scoreboard to be refreshed correctly. Normally you could do it with 10fps (every 100ms a new frame).

Click on **Connect and stream** to send the output over the network.

### TaekoVRHD Capture server application

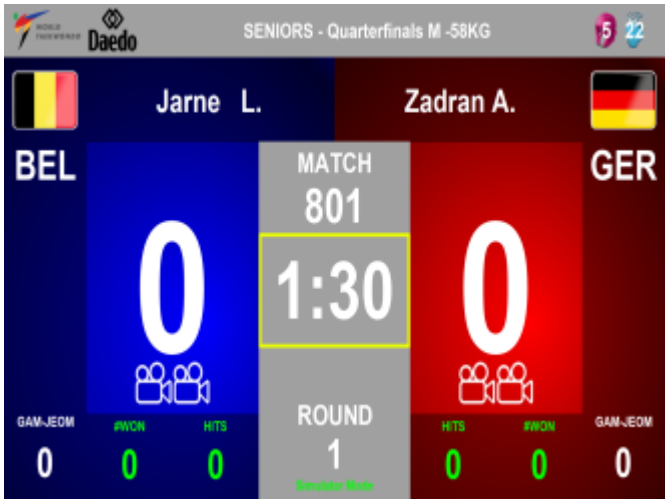



The server application needs to run on the IVR laptop. Start the application and it will show you the settings form:



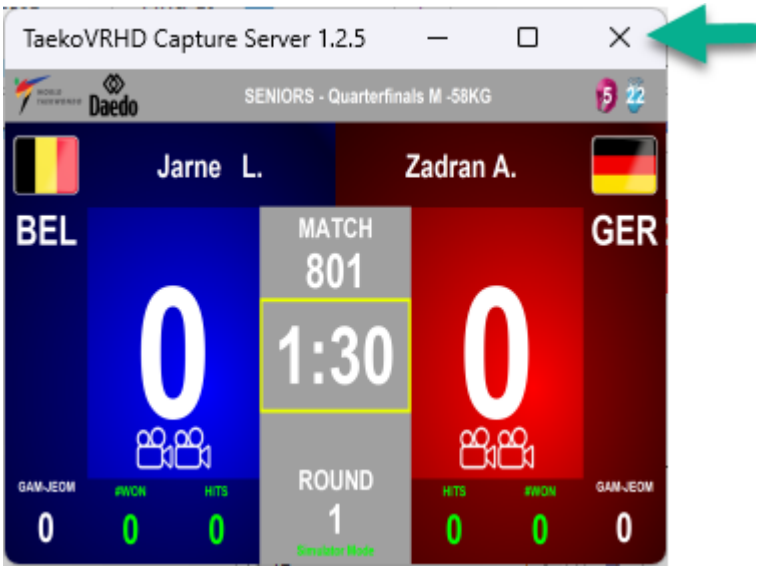

Enter the IP address of the laptop in the network. And the port should be the port as provided in the client. Click on **Start**.

The server should show the selected window form the client:

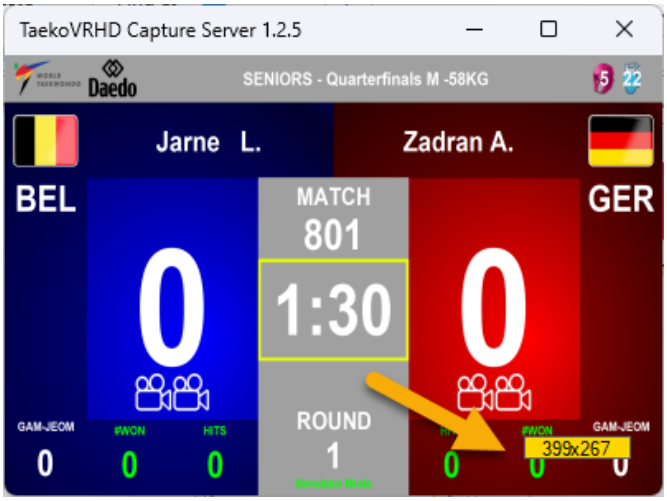



As you can see, the picture looks a little bit out of ratio.

Double-click the picture to get it windowed.




Now you can correct the aspect ratio as it should be added to the capture.
While dragging it, you can see the actual height/width in the bottom right corner:




Adjust the size to what you want. Resizing will be done bicubic, so quality will be retained.

This an example of a small version:

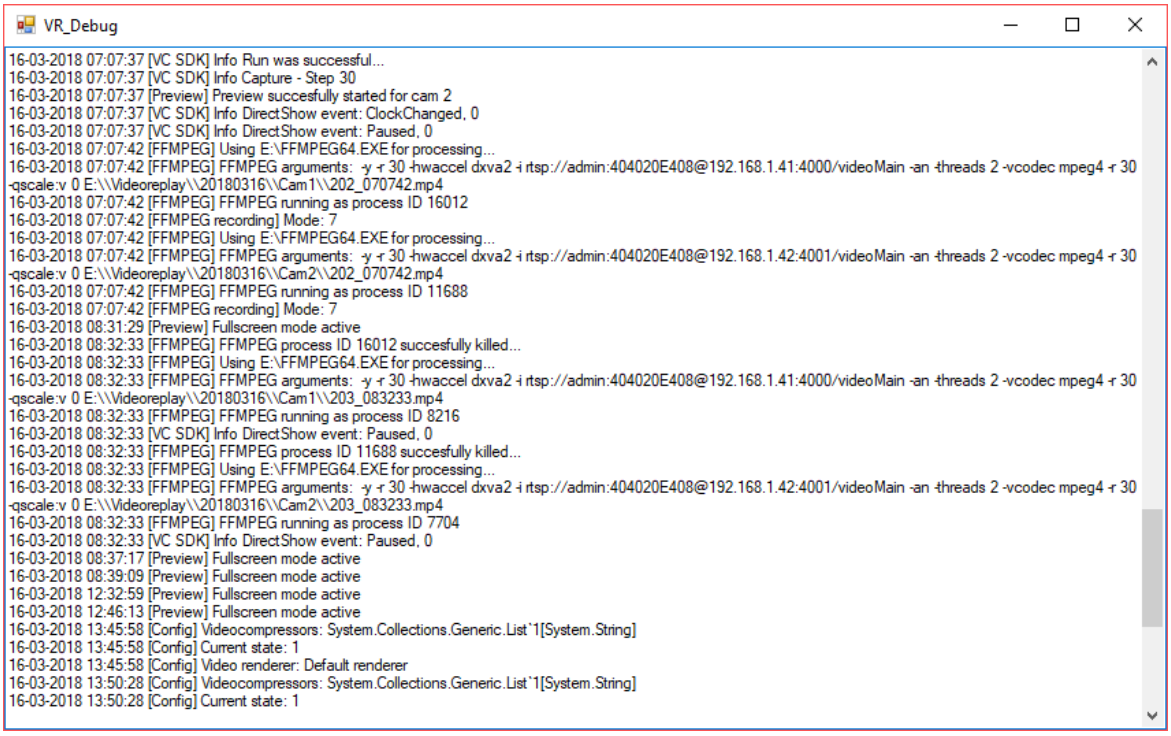

# Part IV

# 4 Other modules

Enter topic text here.

## 4.1 Debug

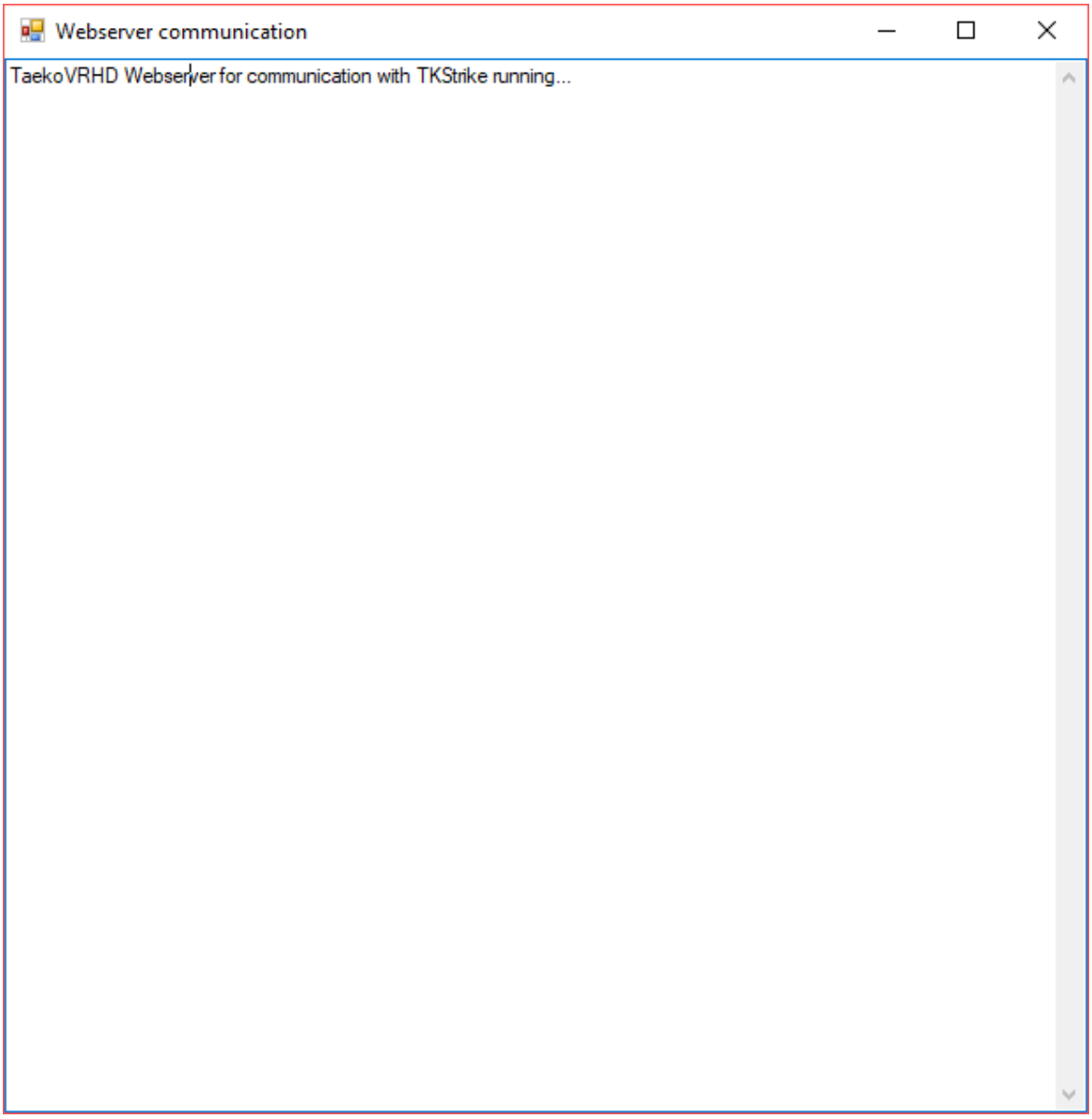
To be able to check for errors when a recording is not started, there is highly detailed debug option available.
It will provide info about the process of preview and recording.




You may need specific knowldge to be able to read the debug log, but you can, at any time send the log to us to help you determine the cause of a problem.

## 4.2 Webserver

There is a built-in webserver for the communication with the Daedo TKStrike scoreboard.

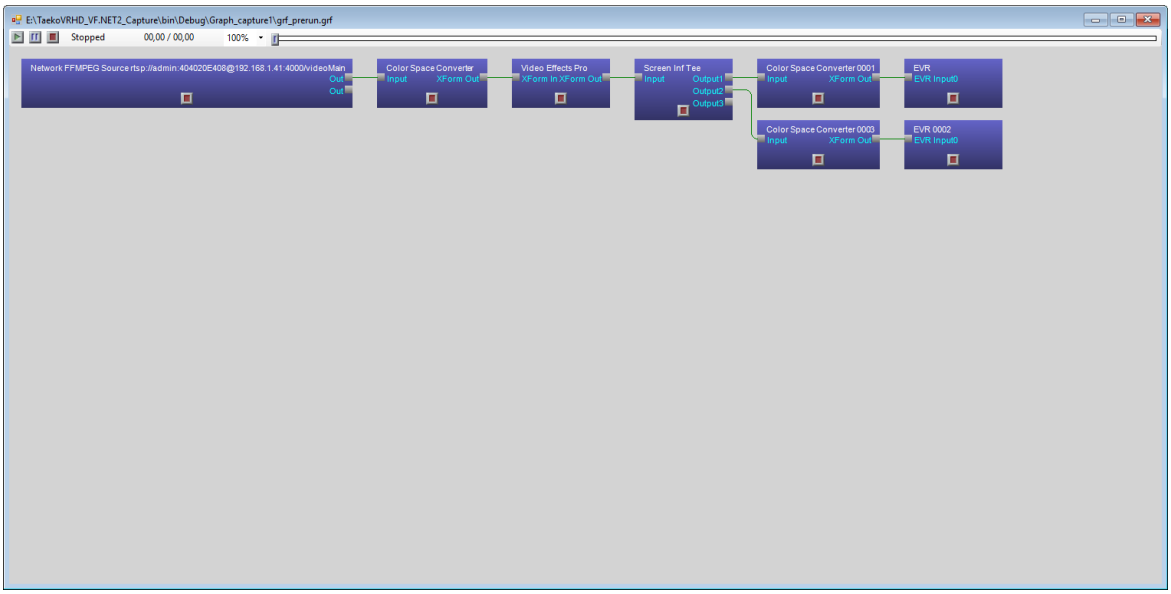



It will provide information and show the communication between the video replay system and Daedo.

## 4.3 Graph info

In case there is a problem with capturing, the program logs the latest graphs created by the engine.

An example looks like this:




This is typically a graph built for capturing an IP camera. Each capture or preview in Windows needs a graph to be built.
The software builds this graph based on the parameters set.


# Part V

# 5 Embed scoreboard

TaekoVRHD offers two types of scoreboard to embed in your capture:

Internal Capture Server 101

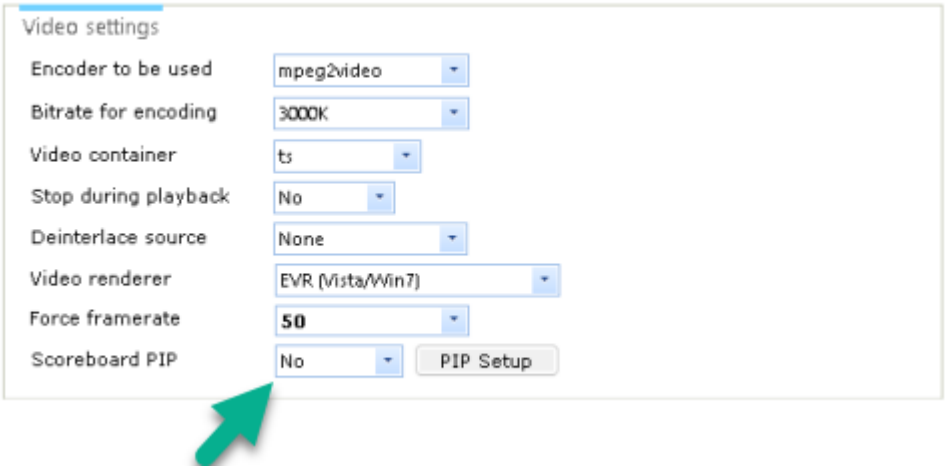

New look scoreboard 105

ALL CAMS

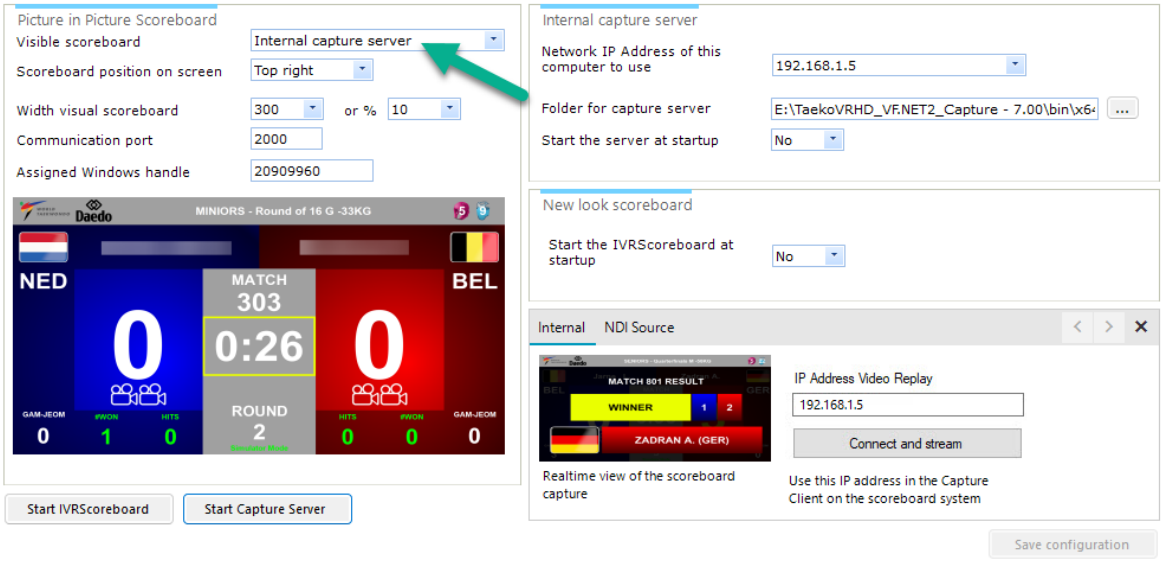
## 5.1 Internal Capture Server

The internal capture server can be added by following the next steps:

In Camera config select to add Picture-in-Picture to your capture:




Click on PIP Setup to open the PIP settings:




On visible scoreboard select **Internal Capture Server**

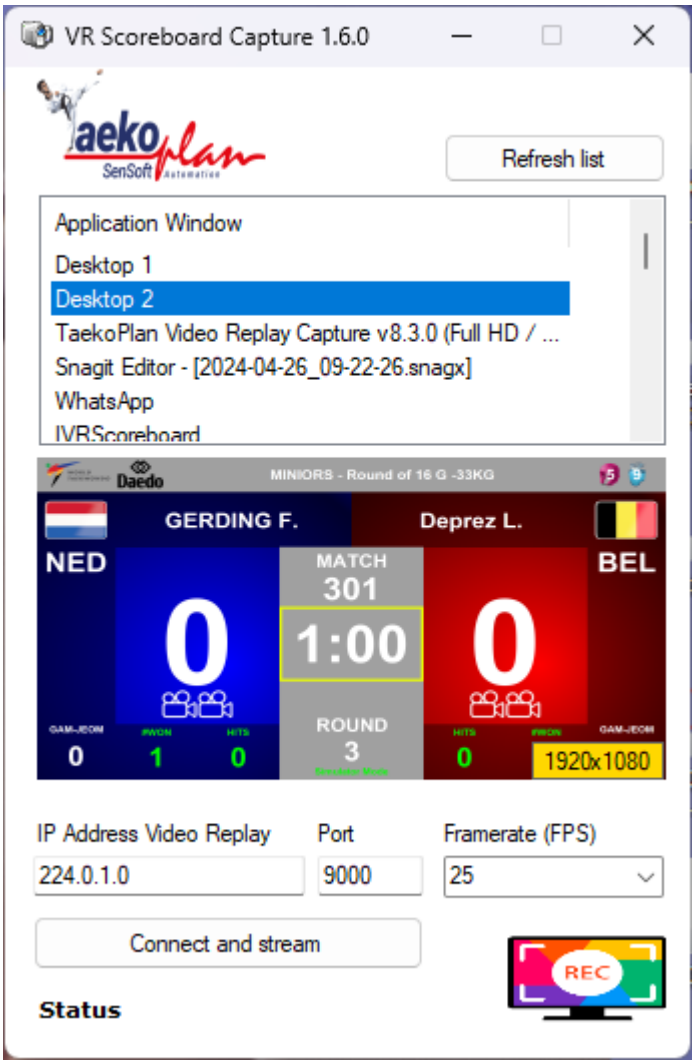
Select the width and height of the embedded scoreboard and the position.
Check for the correct folder for the Capture server to be able to start it.
By default this is ALWAYS the application folder.

Select **Yes** to the **Start the server at startup** to have it running on your IVR laptop.

Note: the **Client** is running on the scoreboard (TKStrike or KPNP) and the **Server** is running on the IVR laptop.

### Client application

The client is running on the scoreboard as mentioned.
Start the application over there.
You only need the executable to be copied to the scoreboard laptop.

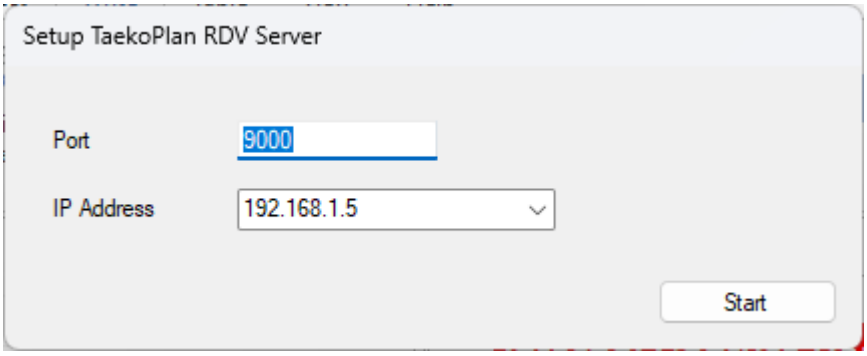



The application windows shows you all the windows that can be captured. Desktop 1 and 2 are fullscreen captures and the other windows are the application windows itself.
Select the window you want to capture.
The **IP Address** is the address of the laptop where to send the data to or it can be a multicast IP address which enables more receivers to pick up the capture.
Multicast IP's start from 224.0.0.0 and up.
The **Port** is the port to be used in combination with the IP address.
**Framerate** is the number of frames (images) sent per second. 25 is a usual number, which allows for a frame per 40 milliseconds.

Click on **Connect and stream** to start the transmission.

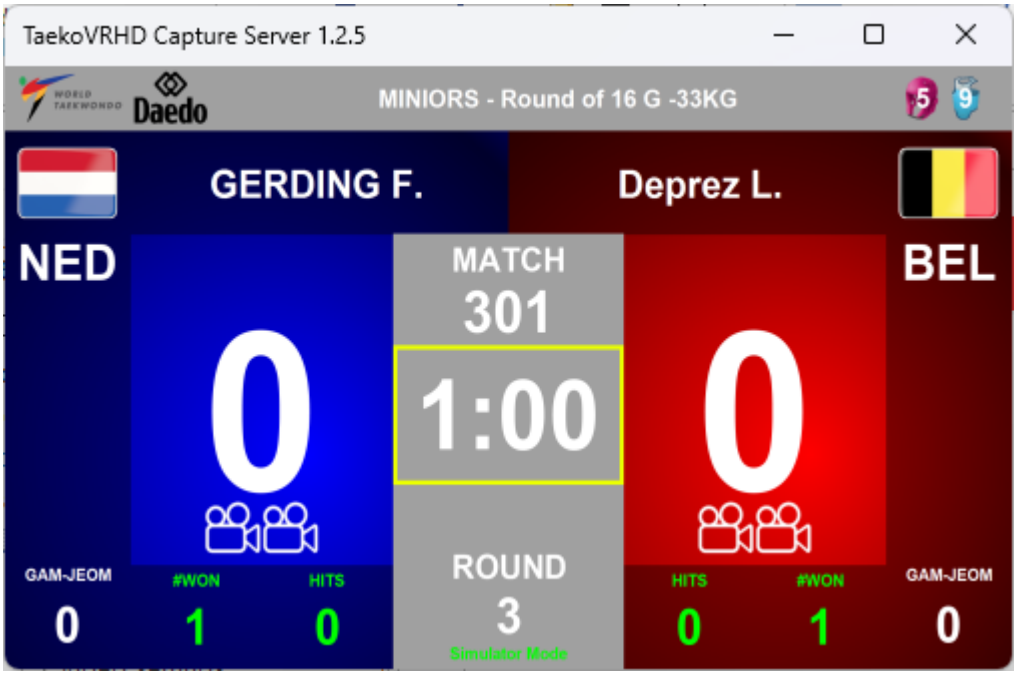
**Server application**

The server application is available in the application folder of TaekoVRHD.
Start the application and it will show a small setup:




This will set the IP address and Port for the receiving part.

The IP address and the port should correspond to the IP address and port set in the client.
Click on **Start** to open the server application window.

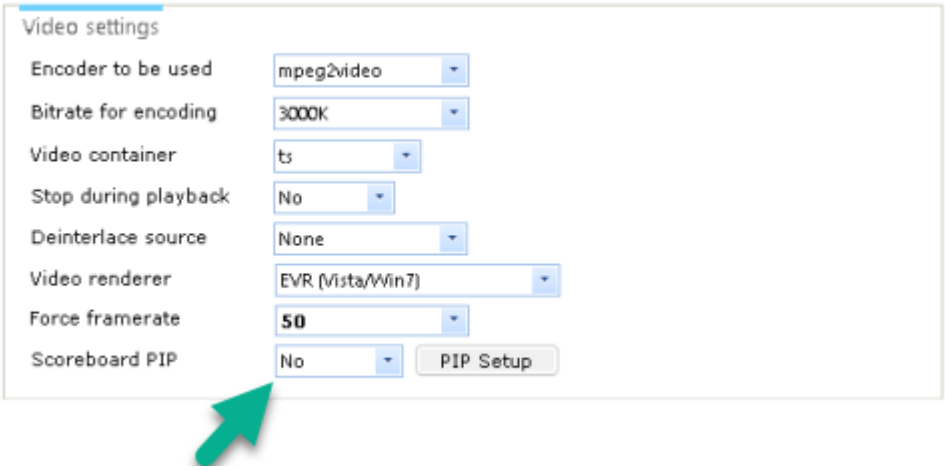



It shows the capture as shown in the client.
You can make this picture smaller or larger by dragging as usual.
Double click on the application to remove or show the title bar.
The capture application is looking explicitly to the **TaekoVRHD Capture Server 1.2.5** window to be able to pick it up.

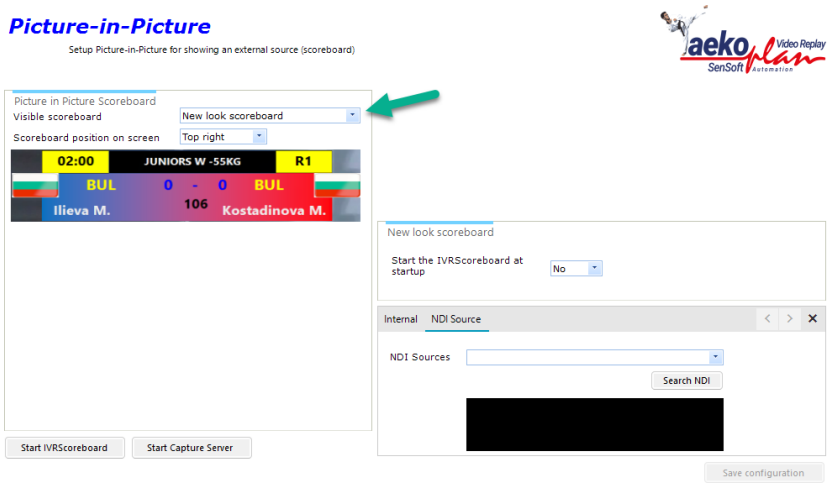
## 5.2 IVRScoreboard

The new look scoreboard can be added by following the next steps:

In Camera config select to add Picture-in-Picture to your capture:




Click on PIP Setup to open the PIP settings:

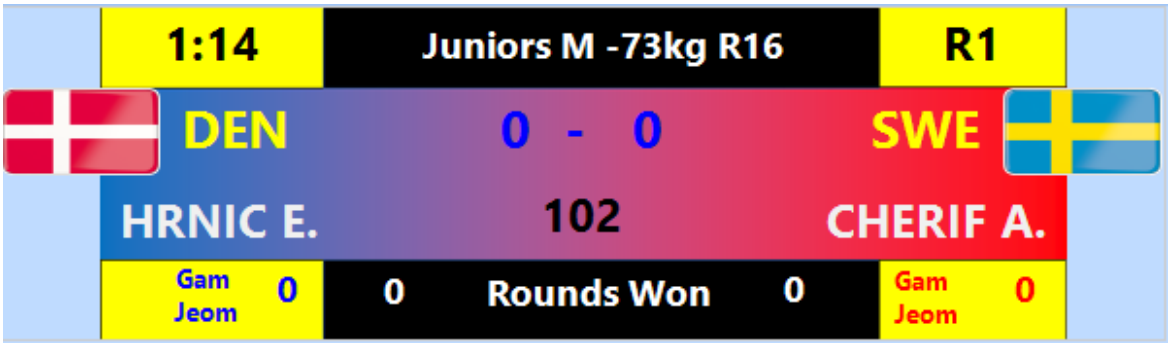



On visible scoreboard select **New look scoreboard**
The new look scoreboard server application is located in the application folder of TekoVRHD.

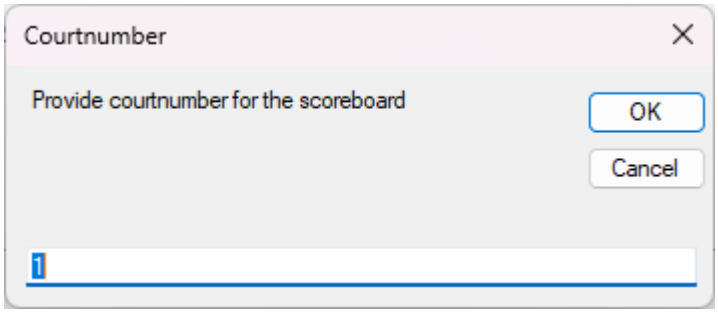
Select **Yes** to the **Start the IVRScoreboard at startup** to have it running on your IVR laptop.
There is **No** client required.

**Server application**

The server application is available in the application folder of TaekoVRHD.
Start the application and it will show the scoreboard

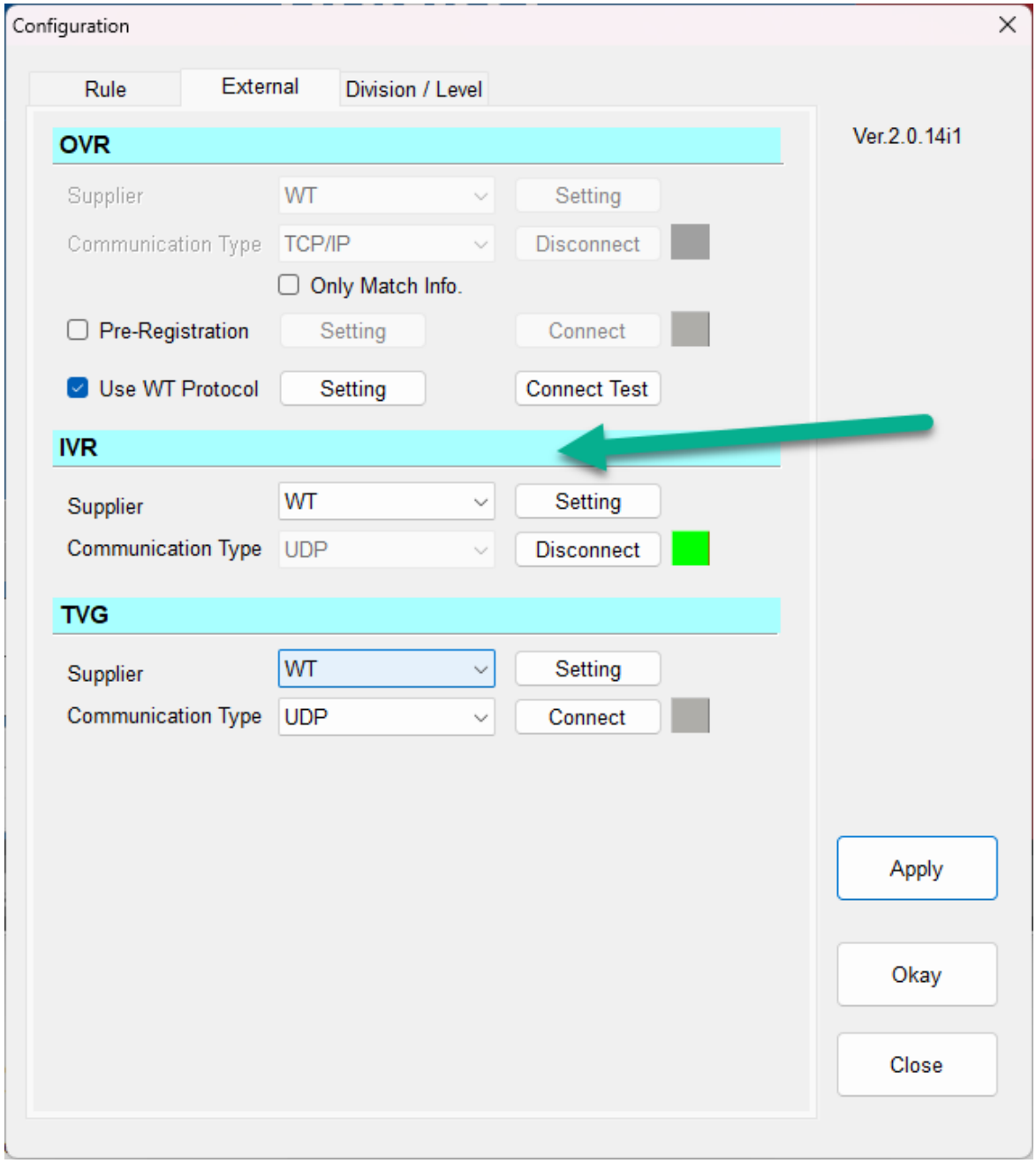



You can provide an argument to the shortcut in Windows with the courtnumber so for example 'VideoReplayScoreboard,exe 1, which will start the scoreboard for court 1.
If you do not enter the argument, you will be prompted at the start:

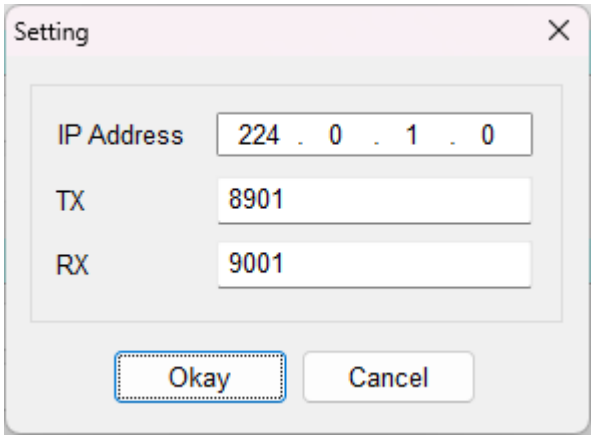



The URL for connecting to the scoreboard is **224.0.1.0:portnumber**.
**The portnumber is 8900 + courtnumber, so for court 1 the port is 8901, for court 8902 etc.**

In KPNP the setup is done in the configuration tab:




Select **WT** as supplier and open the **Setting**. Communication type is **UDP**.



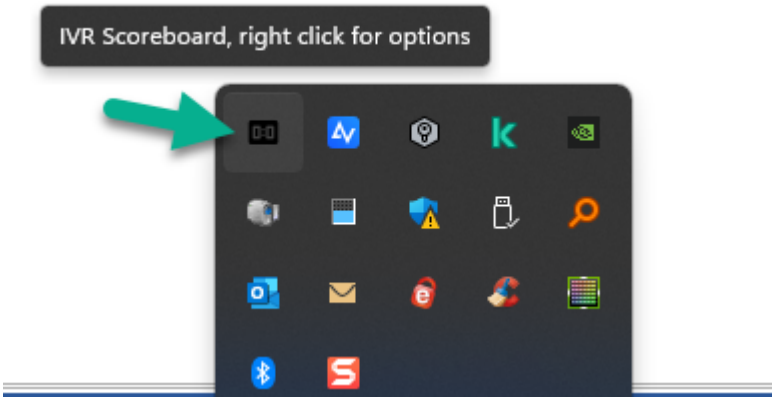

Enter the IP address as mentioned (multicast IP) and the TX port as mentioned above. The RX port is not relevant and not used.
Click on **Connect** to test the connection.

In **Daedo TKStrike** the settings are used as provided in the **connection config** in the capture application.
There you need to create an external provider for data and communication.

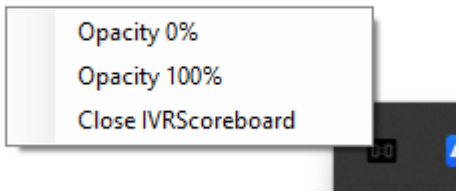
Currently there is **NO** option to start/stop the capture tool from within KPNP. This will come in one of the next updates.

The capture application is looking explicitly to the **IVRScoreboard** window to be able to pick it up.

You might notice that the scoreboard is visible all the time.
You can change this behavior by going to the system tray of Windows desktop and right click the application icon:




It will show you a context menu:

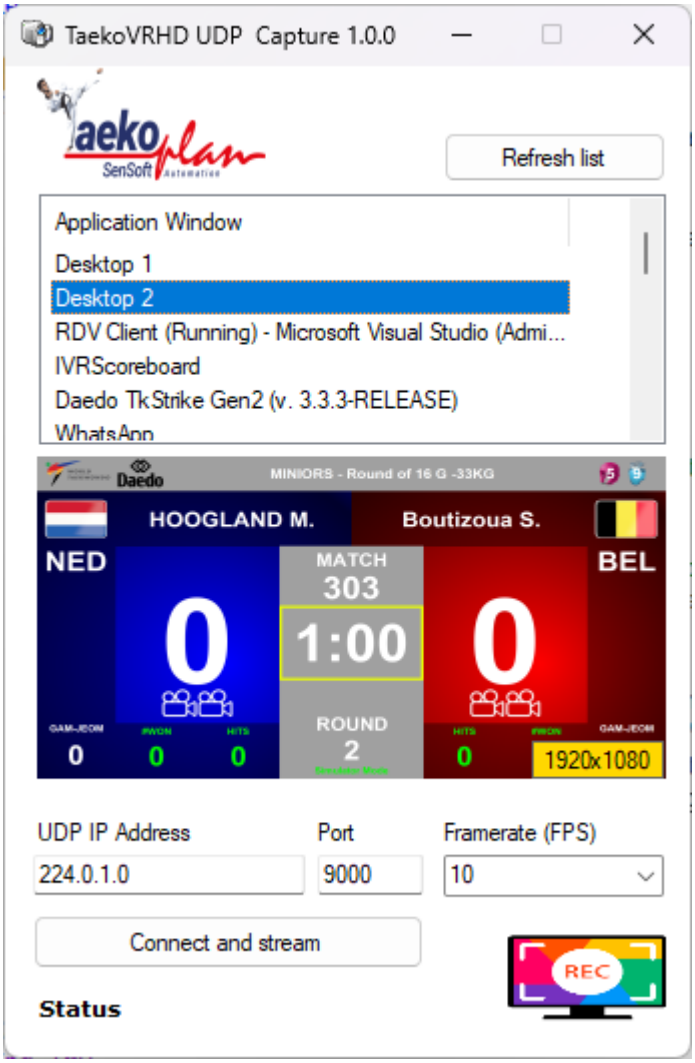



If you select **Opacity 0%**, the scoreboard will still be there, but not visible anymore. The system tray options are still there.
If you select **Opacity 100%**, the scoreboard will be visible and can be closed which is not recommendable.

You can also close the IVRScoreboard from this menu.

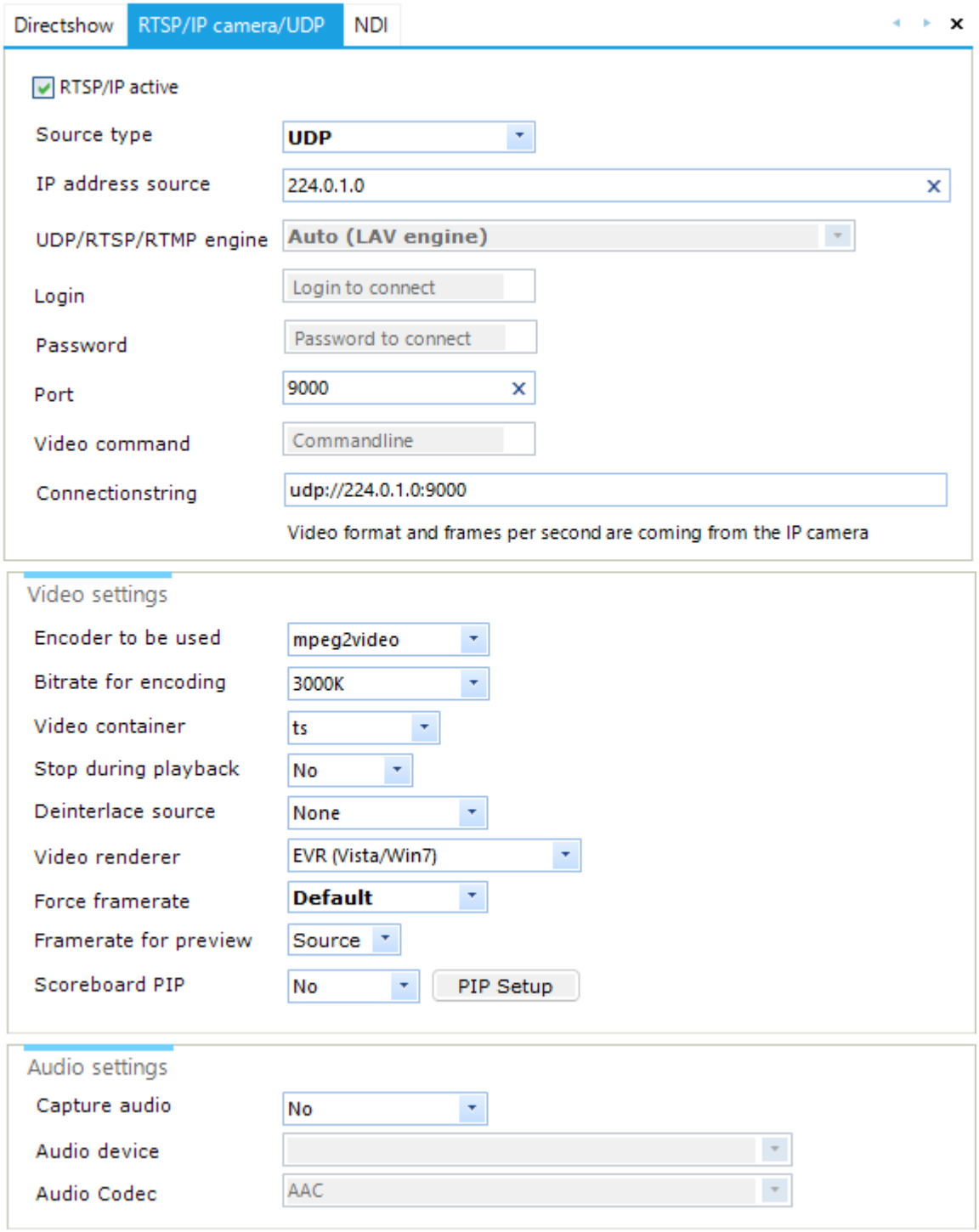
## 5.3 Capture remote screen over UDP

You can also use the UDP Capture application to get a window or full desktop from for example a scoreboard as a new camera picture




Basically the interface is the same as the Capture client/server application.
Only difference is that this client does not have a server but it provides a UDP stream which can be picked up in a device assigned to a camera.

For that use the following settings in the camera config:




The IP Address 224.0.1.0 is a multicast IP address which means that the UDP stream can be rerouted to more than one device.
For this device only the IP address and port needs to be filled and need to be the same as set in the UDP Capture client.

You do **NOT** need to set the **scoreboard PIP** to Yes for this device, as the camera output will already show the scoreboard.
It can be captured/recorded like any other device.

# Index