

MXC – MULTI CROSS CONVERTER

Multichannel Video Cross Converter

(Rev. 1.1)



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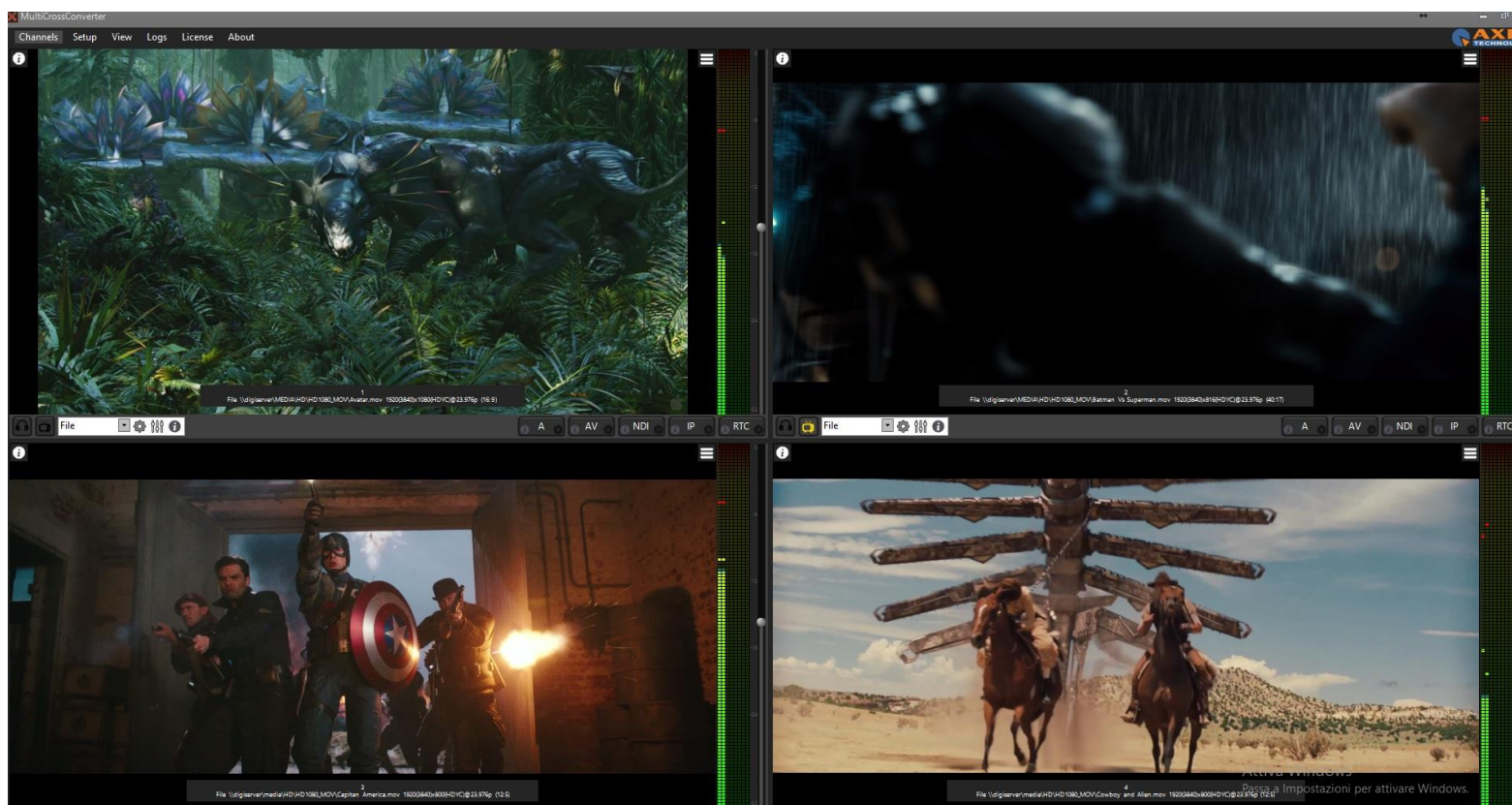
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1 INTRODUCTION

The power of MULTICROSS CONVERTER is its versatility. The software is designed on different channels. Depending on the license you have acquired you will have a different number of usable channels simultaneously.

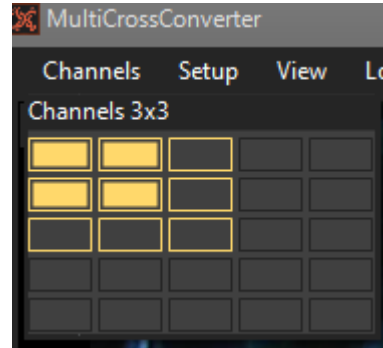
For each channel you have:

- the input selectable from SDI/NDI/IP upscaled/downscaled/converted to SDI/NDI/IP.
- SDI IN or OUT (according to installed videoboard).
- IP formats: UDP/RTMP/RTSP/HTTP.
- Multiviewer style GUI with VU Meter
- audio level adjust, crop, fields inversion.



2 CHANNELS MENU

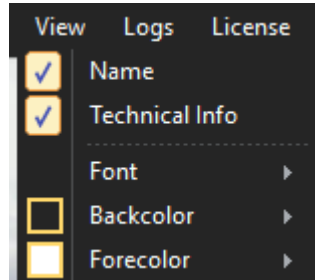
At the top left of the home page press **Channels**, with the mouse select the desired number of channels. The available channels number depends on your Multi Cross Converter software license.



3 SETUP

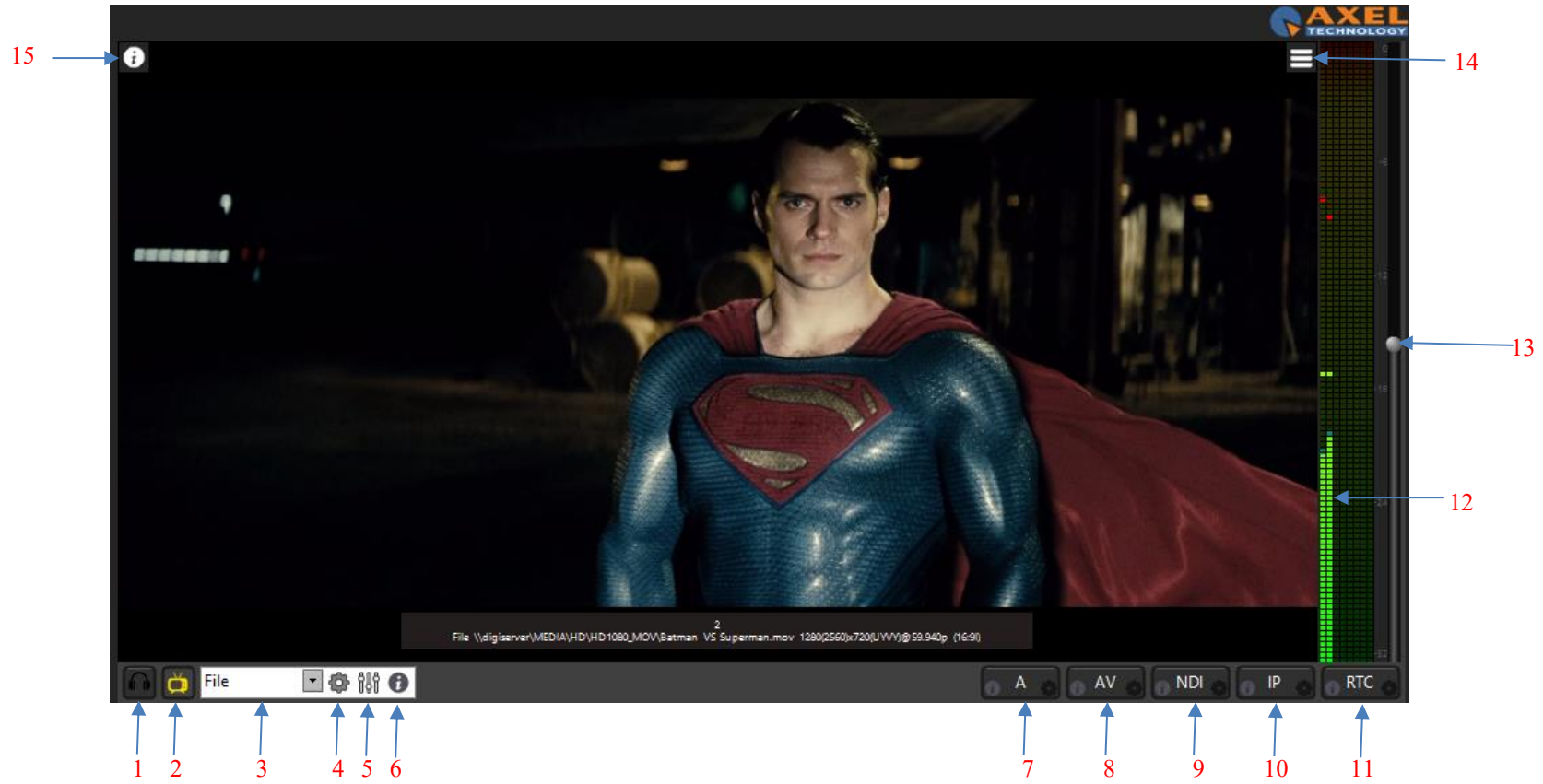
Language	Invariant Language (Invariant Country) ▾	Here you can select the Language of the software. Actually the only option available is Invariant Language (Invariant Country)
	<input type="checkbox"/> TCP/IP log	Here you can enable the logs about the TCP/IP connection and datas transmission. Useful if you work with IP sources or targets.
	<input type="checkbox"/> Debug log	This logging mode records more information than the default Log
	<input type="checkbox"/> Debug Verbose log	This logging mode records more information than the Debug Log
Real-Time Preview	Full Rate ▾	Here you can select the Rate of the preview, choose between 1/2, 1/3, 1/4, 1/5
Bars format	<Auto/Not Specified> ▾	Here you can select the Bars Format compatibly with your video format: NTSC, PAL, HD, 2K, 4K
	VGA compatibility mode <input type="checkbox"/>	VGA compatibility mode allows you to see the preview without any performant video board.
AV direct out	Automatic ▾	Direct access to a Decklink video boards. Use it only with specified decklink models. Do not enable this check if you have a Decklink Duo 2, Quad 2 and SDI 4K
	Start local rtmp server <input type="checkbox"/>	By checking this parameter you will active a RTMP server that will stream all RTMP streams with the IP address of this current PC. This option is useful for the IP streaming or for the WebRTC transmission
	<input type="checkbox"/> Relaunch at: 00:00:00 ▾	The Multi Cross Converter will be automatically restarted everyday at this hour

4 VIEW



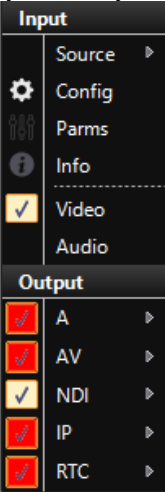

<input checked="" type="checkbox"/> Name	Here you can decide to visualize or not the Channel name in the interface panels of the channels
<input checked="" type="checkbox"/> Technical Info	Here you can decide to visualize or not the Technical Info in the interface panels of the channels
Font ▶	Here you can choose the Font for the Name and for the Technical Info in the interface panels of the channels
<input type="checkbox"/> Backcolor ▶	Here you can select the Backcolor of the Name and of the Technical Info in the interface panels of the channels
<input type="checkbox"/> Forecolor ▶	Here you can select the Forecolor of the Name and of the Technical Info in the interface panels of the channels.

5 INTERFACE PANEL OF THE CHANNEL




0

1	Enables/Disables the audio preview of the channel
2	Enables/Disables the video preview of the channel
3	Here you can select the video source. Select between, <Bars>, AV DEVICE, FILE, IP, NDI, WEBRTC
4	Once you have selected the desired video source by the next top-down menu, you can press this button to enter in the source settings . Go to 5.1, 5.2, 5.3, 5.4, 5.5, 5.6 paragraphs to read for detailed descriptions of the single source settings.
5	By clicking on this button you will open the panel with the video settings . Go to 5.7 paragraph to read for detailed descriptions

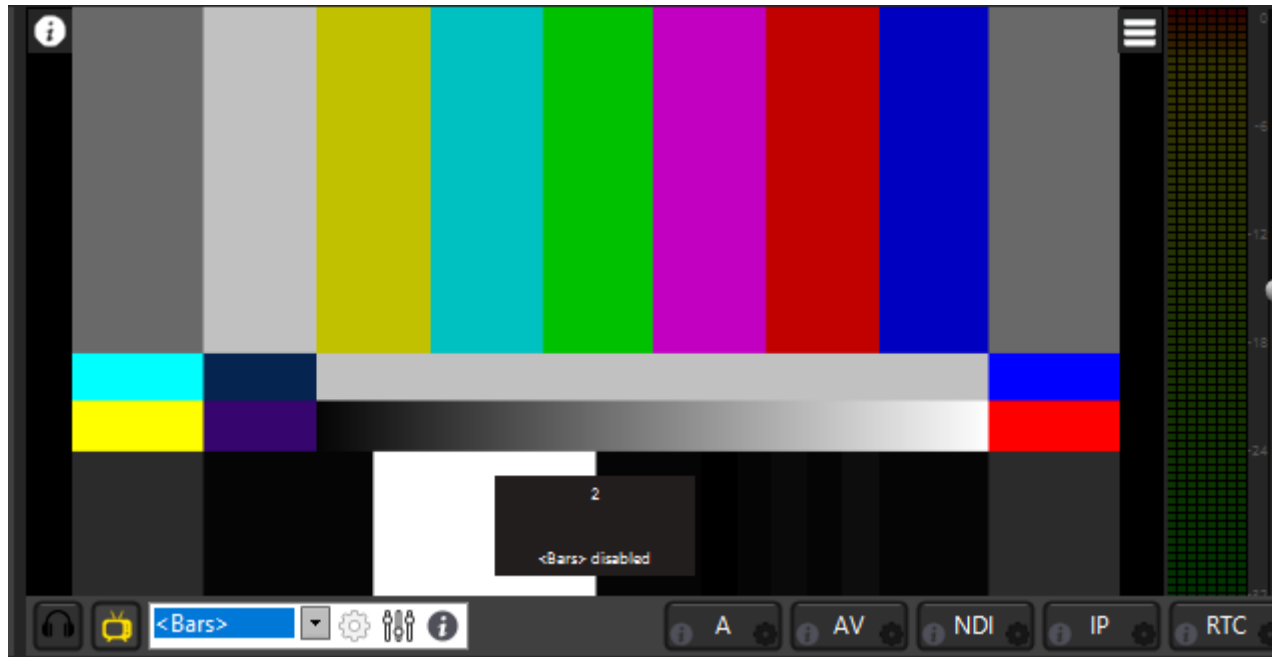
6	From this button you enter in a window with all the stats and settings related with the video source and format.
7	By pressing this button you will root the audio of the clip to a desired target sound card
8	By pressing this button you will root the video to a desired target video card
9	By pressing this button you activate the streaming of your channel through the NDI protocol.
10	By pressing this button you can stream the channel video to an IP target: RTMP, UDP, RTSP, IIS, RTMP (FMLE), Windows Media Streaming.
11	By pressing this button you can send the channel video to an RTC
12	This is the Led bar of the audio of the channel
13	By this control you can change the audio volume of the channel
14	By this Settings button you can easily and fastly access to all channel settings.  <p>If other submenus are available you can open them by clicking on </p>
15	From this button you enter in a window with all the stats and settings related with your channel video preview and preview format.

5.1 AVAILABLE VIDEO SOURCES

By opening the source menu  (numbered as 3 in the previous picture) you should be able to select the desired Video source for your current MULTICROSS CONVERTER channel.

5.1.1 <BARS> – SOURCE SETTINGS

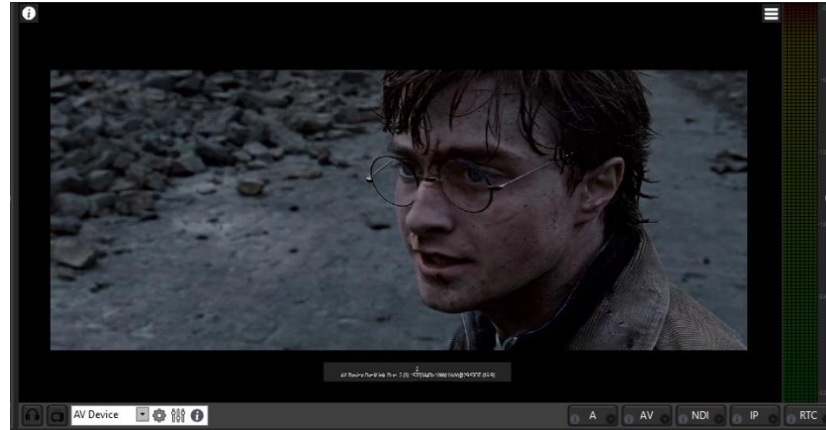
By selecting <Bars> you are going to choose Video Bars generator for the current channel. Then the Video Bars will be rooted to all the selected targets. With <Bars> selection you will not have anyother parameter to set.




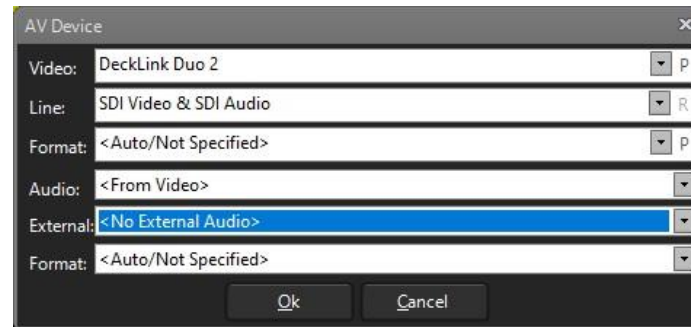
This <Bars> source is the only one which does not has any setting.

5.1.2 AV DEVICE – SOURCE SETTINGS

By selecting the AV DEVICE source you also have to set the desired device parameters. Usually here you can take Video signal from all the Video Cards connected with the PC.



By clicking on the settings  button the settings tab will be opened. Fill all the desired parameter to set all the audio and video desired settings:



Video	Between all available Video Devices connected with this PC, select the desired one
Line	This parameter shows you the audio and video interface of the device, for any chosen AV device.
Format	By selecting Auto you automatically choose the selected Video Device video format
Audio	In this menu you can choose between <From Video> and <No Audio> : <ul style="list-style-type: none"> - By selecting <From Video> the audio will be captured with the related video - By selecting <No Audio> the audio will not be captured at all. You can select the desired audio from an External Audio Source from the next External parameter

External	Here you can choose between all the channels of all the available Audio Devices actually connected with this PC.
Format	Audio format selection. By selecting Auto you automatically choose the same Device audio format.

The clickable **P** button allows you to set for additional parameters if availables
The clickable **R** button allows you to refresh the connection with the selected stream.

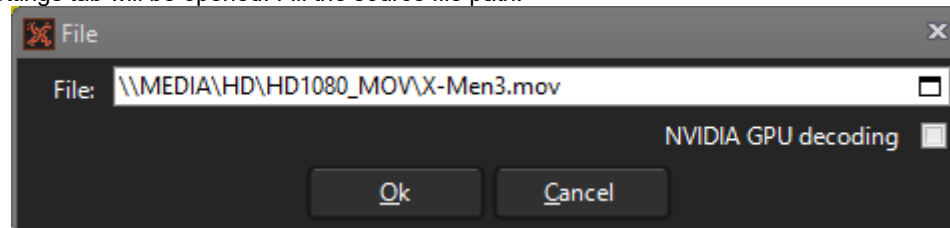
By clicking on Cancel you will not apply the setting changes.
By clicking on OK you will start the Video Device capture for this channel.


5.1.3 FILE – SOURCE SETTINGS

By selecting File source, you have to select the desired file from your PC or from any folder of your NETWORK.



By clicking on the settings  button the settings tab will be opened. Fill the source file path:



File	You can type here the whole path of your desired file source or you can select it by clicking on the button explained in the following line.
	By clicking on this button you will be able to choose your desired file from your local or network folder.
NVIDIA GPU decoding	If a NVIDIA board is connected to the current PC, this option could be selectable to free the CPU and the internal graphic engine of this Pc from the decoding stress. By checking this parameter this MultiCrossConverter channel offloads any decoding to an external NVidia device.

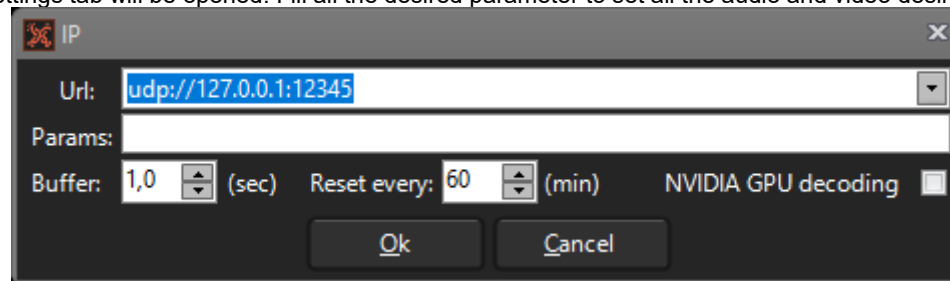
By clicking on Cancel you will not apply the setting changes.
By clicking on OK you will start the Video Device capture for this channel.


5.1.4 IP – SOURCE SETTINGS

By selecting IP source you will be able to catch any IP stream.



By clicking on the settings  button the settings tab will be opened. Fill all the desired parameter to set all the audio and video desired settings:

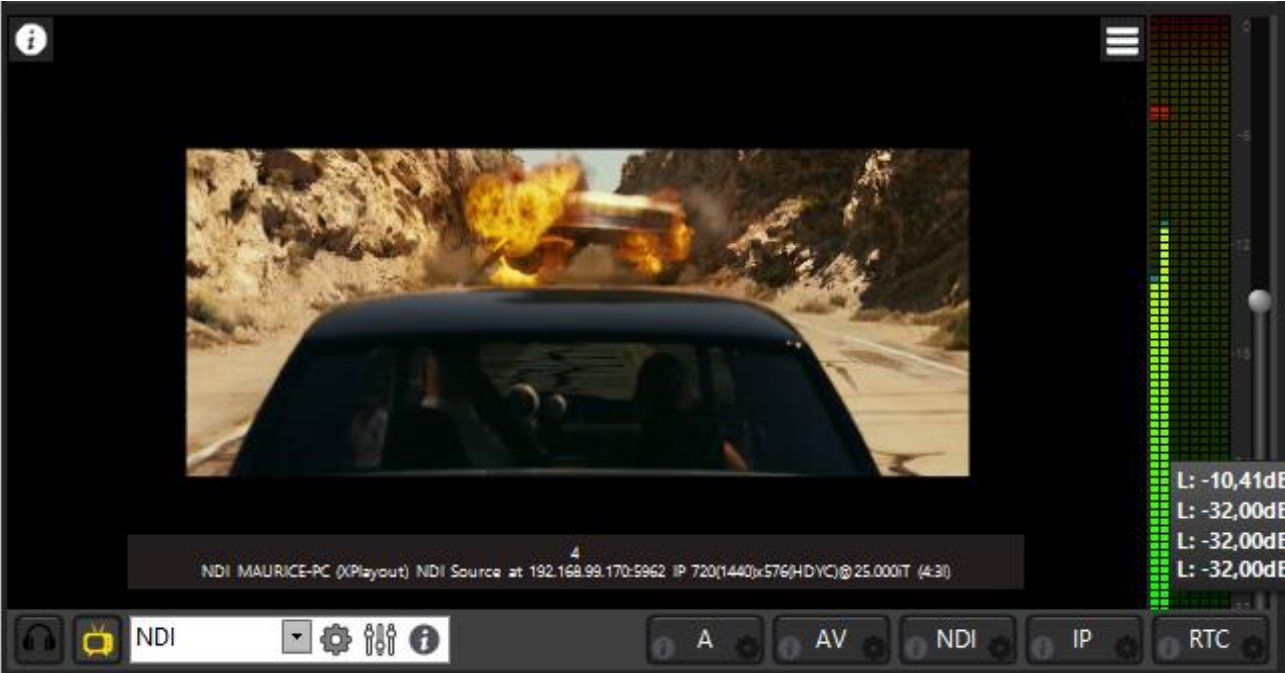



Url	URL from which you want to catch the stream
	By clicking on this arrow, you will be able to choose between previous available URLs
Params	Additional parameters
Buffer	Buffer seconds to destress the CPU
Reset every	Resets the connection with the typed Url every minutes decided in this field
NVIDIA GPU decoding	If a NVIDIA board is connected to the current PC, this option could be selectable to free the CPU and the internal graphic engine of this Pc from the overhead. By checking this parameter this MultiCrossConverter channel offloads any decoding to an external NVidia device.

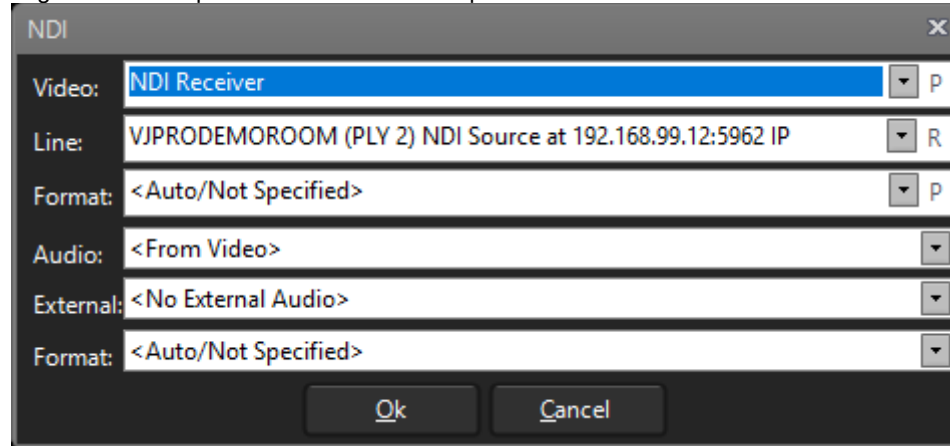
By clicking on Cancel you will not apply the setting changes.
By clicking on OK you will start the Video Device capture for this channel.

5.1.5 NDI – SOURCE SETTINGS

By selecting NDI source you will be able to catch any desired NDI feed generated by any NDI encoder. Select the desired NDI feed to set it in the current MULTICROSS CONVERTER channel.



By clicking on the settings  button the settings tab will be opened. Fill all the desired parameter to set all the audio and video desired settings:



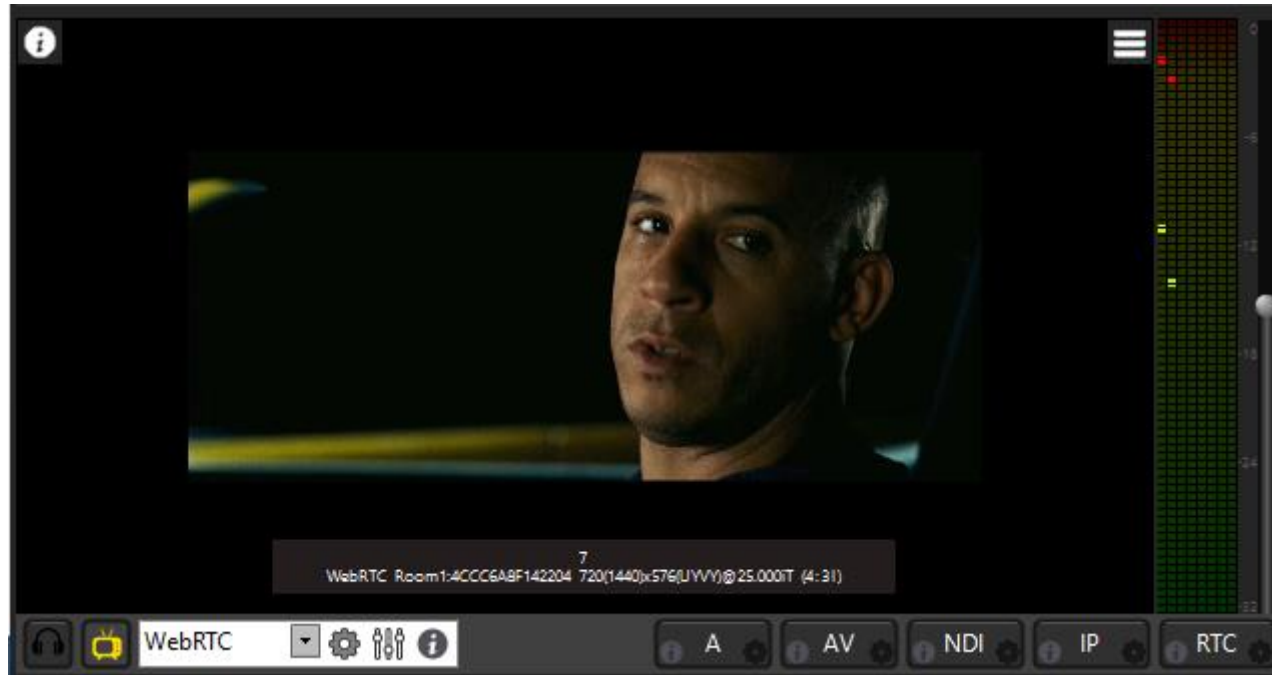
Video	Displays NDI Receiver is active
Line	Select between available NDI streams
Format	<ul style="list-style-type: none"> - If you select Auto/Not Specified the video format is always the same of the received NDI stream. - If you select None the video will be disabled on all the channel targets.
Audio	<ul style="list-style-type: none"> - If From Video is selected, the audio Format is the same of the received NDI stream. - By selecting No Audio and No External Audio in the following External parameter - Here you can decide to don't have any audio By selecting No Audio and by selecting the desired available Audio source from next External parameter, here you can decide to have a different audio from the one of the Video
External	If No Audio is selected in Audio you can choose between all the available Audio Devices.
Format	<ul style="list-style-type: none"> - If you select Auto/Not Specified the audio format is always the same of the received NDI stream if From Video is selected in Audio parameter. - If you select Auto/Not Specified the audio format is the once captured by the selected External Audio Device. - If you select None the audio will be not rooted to the channel targets.


The clickable **P** button allows you to set for additional parameters if availables
 The clickable **R** button allows you to refresh the connection with the selected stream.

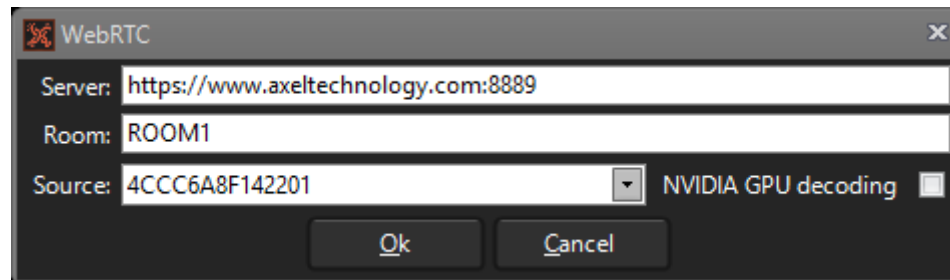
By clicking on Cancel you will not apply the setting changes.
 By clicking on OK you will start the Video Device capture for this channel.

5.1.6 WEBRTC (WEB REAL-TIME COMMUNICATION)– SOURCE SETTINGS

By selecting WEBRTC source, for the current channel you will be able to obtain, display and root a WEBRTC video feed generated by a WEBRTC encoder.



By clicking on the settings  button the settings tab will be opened. Fill all the desired WebRTC transmission data.:

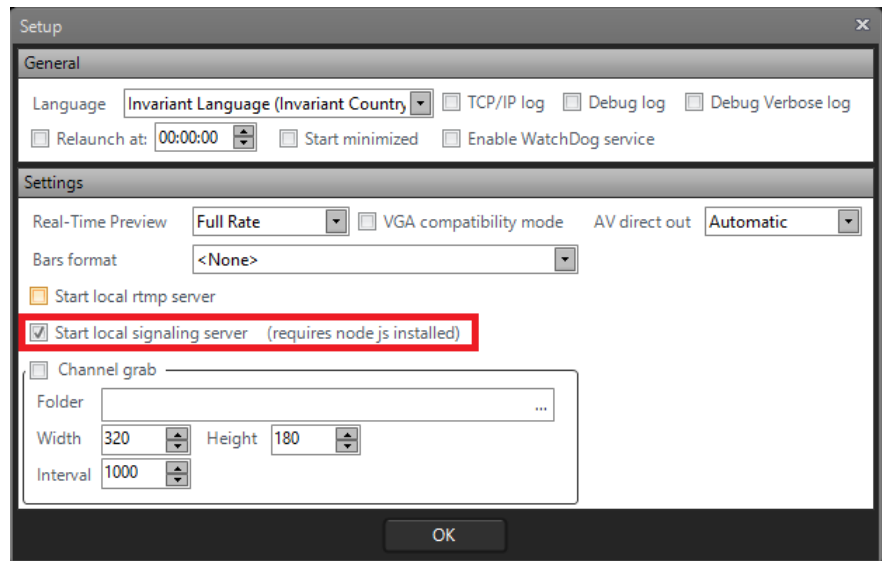


Server	You can type here the URL of the WebRTC Server by following the following syntax: URL:PORT.
---------------	---

Room	If available type here the room name
Source	If more streams are available in the same room, type here the exact hexadecimal code related with the desired source transmission.
NVIDIA GPU decoding	If a NVIDIA board is connected to the current PC, this option could be selectable to free the CPU and the internal graphic engine of this Pc from the overhead. By checking this parameter this MultiCrossConverter channel offloads any decoding to an external NVidia device.

In the WEBRTC settings you can type the following URL , in example the following free Axel Technology WEB RTC server: <https://www.axeltechnology.com:8889>

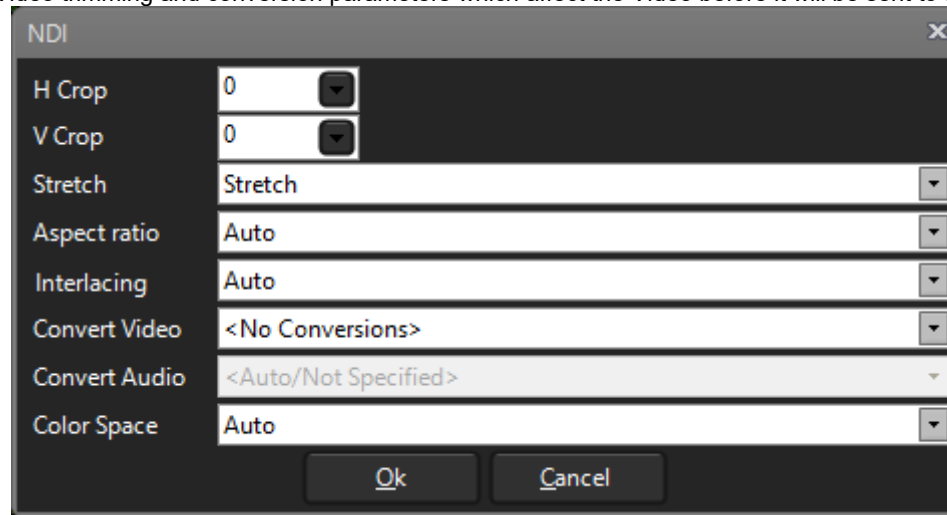
In case you would not be able to connect through the internet, inside the MultiCrossConverter you can set a local server. To set it go to Setup>Settings>Start local signaling server as shown by the following picture:



As you can read it is required an installed node js.

5.2 VIDEO SETTINGS

On each channel it is possible to set some Video trimming and conversion parameters which affect the Video before it will be sent to all the selected targets:



H Crop	Set the Horizontal crop for the clip (0 = no crop, 100 = max crop)
V Crop	Set the Vertical crop for the clip (0 = no crop, 100 = max crop)
Stretch	Set the clip stretch option by choosing between: Stretch, Crop, Preserve AspectRatio and Preserve AspectRatio Full. <ul style="list-style-type: none"> - Stretch: the video will be stretched to fit in the whole target resolution without respecting the original aspect ratio - Crop: the video will be exactly the original one (No Scale mode) without adding black bars - Preserve aspect ratio: preserves the original aspect ratio independently of the target aspect ratio. - Preserve aspect ratio full: preserves the original aspect ratio but the video will be exactly fitted in the target aspect ratio by adding black bars if needed.
Aspect ratio	Set the desired aspect ratio. Choose between: Auto, 4:3, 16:9. If auto is set the aspect ratio will be the ones defined on the source. Select 4:3 to force AR manually. Select 16:9 to force AR manually.
Interlacing	Set the desired one Interlacing mode by choosing between: Auto, Top, Bottom, Progressive. If Auto the Interlacing mode will be taken from the original source. By choosing Top the fields scan will be forced to start from the top. By choosing Bottom the fields scan will be forced to start from the bottom. By choosing Progressive the field scan will follow the fields progression.

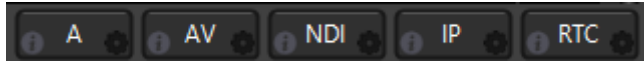
Convert Video	By this parameter it will be possible to have a real-time conversion of the Video format for all the selected targets. Open the drop-down menu and select the conversion to the desired Video Format. By selecting <No Conversion> the original Audio/Video format of the source will be kept. It will not be possible to select any conversion to different Video formats or Audio formats. By selecting <Auto/Not Specified> the original video format of the source will be kept without changes. It will be possible to select a conversion to a different Audio Format through the next Convert Audio menu.
Convert Audio	By this parameter it will be possible to have a real-time conversion of the Audio format for all the selected targets. Open the drop-down menu and select the conversion to the desired Audio Format. By selecting <Auto/Not Specified> the original Audio format of the source will be kept without changes.
Color Space	Select between available Color Spaces the desired one to organize colors in the most suited way. By selecting Auto the original Color Space of the source will be kept without changes.

5.3 AVAILABLE TARGETS

Multi Cross Converter most important feature is to route the Video to a desired target or to multiple targets.

In fact, if needed, more targets could receive the same video simultaneously.

On each channel you can select and set the desired targets from this useful TARGET BAR:



The color of the single target name refers to a target state. In this example we are going to consider the NDI target, but all the colors have the same meaning for all the available targets:

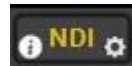


white color of the target name means that the target is not selected




red color of the target name means:

1. In the case of Audio or Audio/Video device could be related with the absence of proper devices
2. In the case of other targets could be related with wrong settings or with the absence of connection to a LAN network

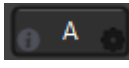


yellow color of the target name could mean:

1. there are available Audio/Video devices usable as A or AV targets
2. On other 3 network targets, it means the yellow one is well-set and the presence of a good connection to a LAN network.

For each available target, by clicking on the  button you will open a tab with all the stats and parameters of the related target.

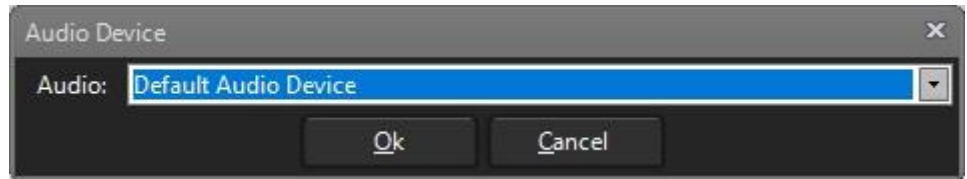
5.3.1 A (AUDIO DEVICE) – TARGET SETTINGS

If you want to use an Audio Device as your channel target enable the button 

By selecting this target you will route only the audio of the Video assigned to this MULTICROSS CONVERTER channel .

Press 

to enter in the Audio Target settings:




By expanding **Audio** drop-down menu you will be able to select the desired Audio Device between all the available ones:



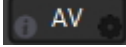
By clicking on Cancel you will not apply the setting changes.


By clicking on OK you will start the Video Device capture for this channel with the current parameters.

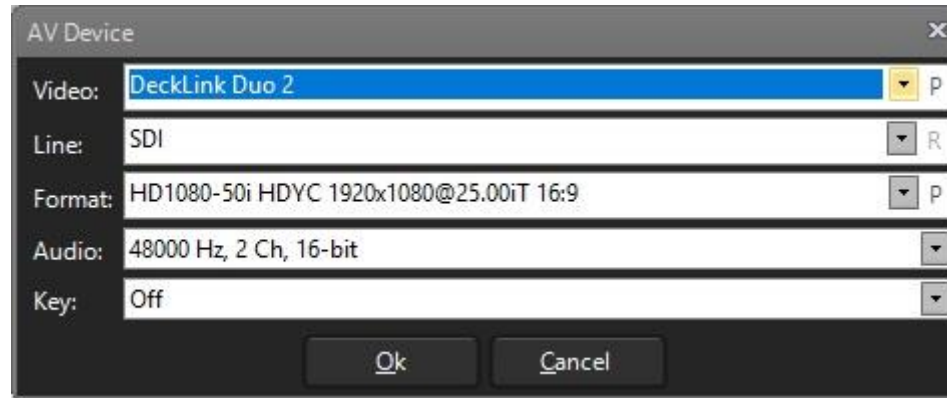
if the desired audio target is set correctly the 

button turns to yellow.

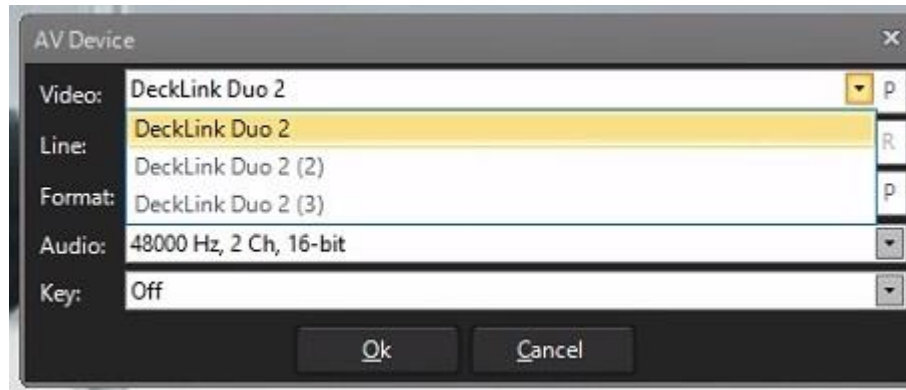
5.3.2 AV (AUDIO VIDEO DEVICE) – TARGET SETTINGS

If you want to use a Video Device as your channel target enable the button . By selecting this target you will route the entire Video Signal assigned to this MULTICROSS CONVERTER channel..

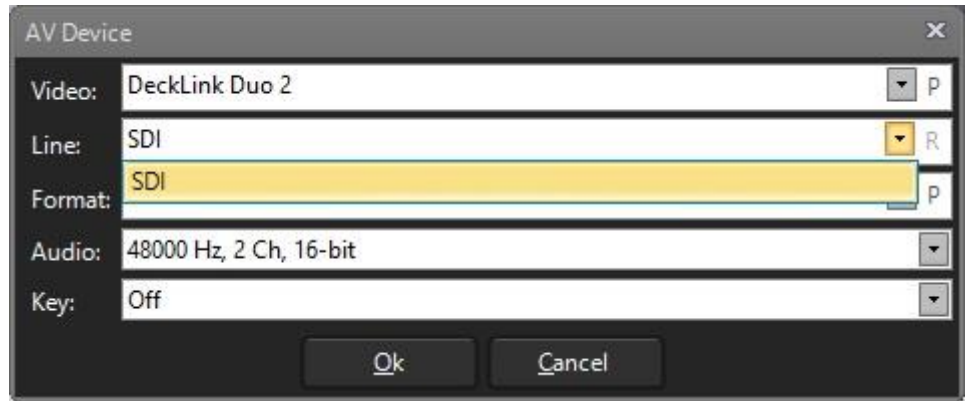
Press  to enter in the Video Target settings:



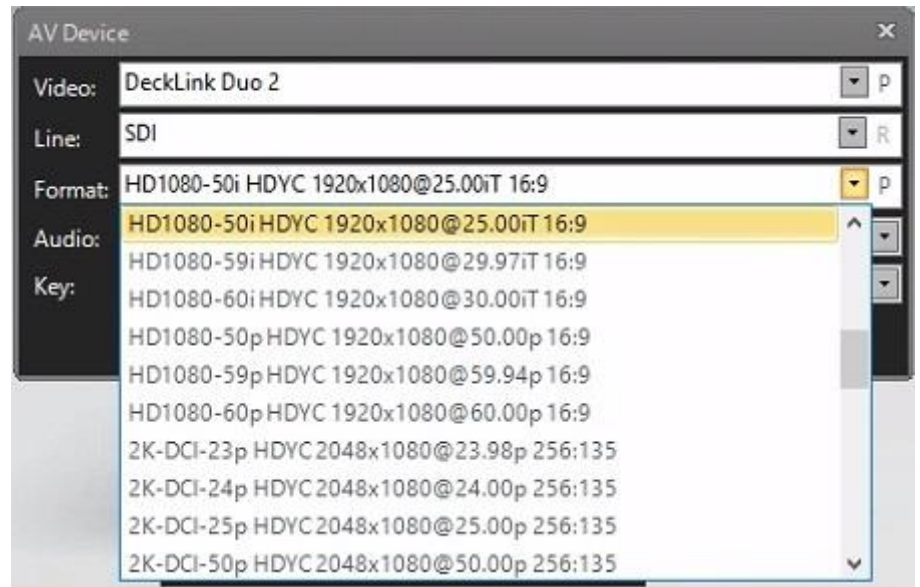
By expanding **Video** drop-down menu you will be able to select the desired Video Device between all the available ones:



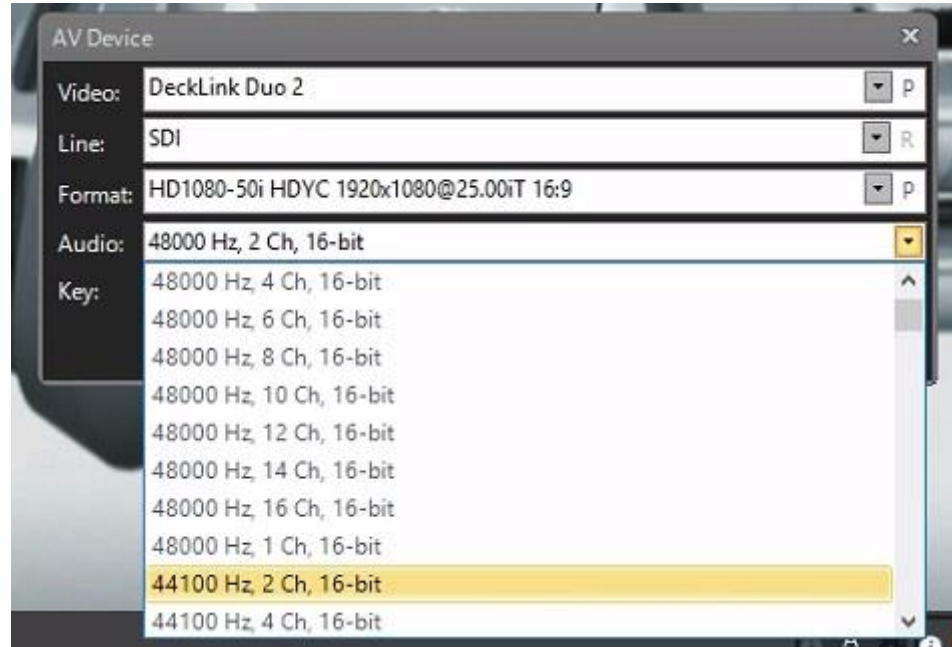
By **Line** field you will be able to read the signal type:



By expanding **Format** drop-down menu you will be able to select the desired video format between all the available ones:



By expanding **Audio** drop-down menu you will be able to select the desired sample rate value (including channels number and bit depth) between all the options available:

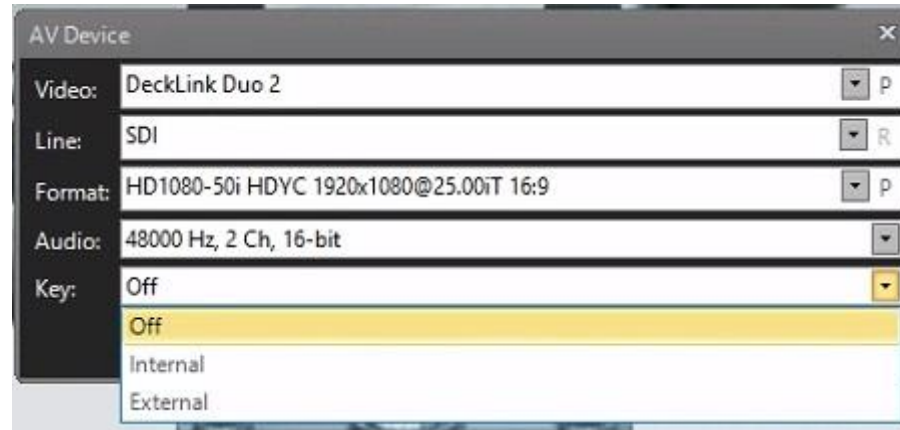


By expanding Key drop-down menu you can choose between 3 available channel options regarding alphacannel and key.

Off: with this option, the original alphachannel of the input video will be lost. It will not be possible to have overlay features on the targets.

Internal: with this option, the original alphachannel of the input video will be preserved and the overlay can be achieved by the connected videoboard itself in "video in/ video out" mode.


External: with this option, the original alphachannel of the input video will be preserved and will be sent to the videoboard using key and fill outputs or to other targets.



The clickable **P** button allows you to set for additional parameters if availables
The clickable **R** button allows you to refresh the connection with the selected stream.


By clicking on Cancel you will not apply the setting changes.

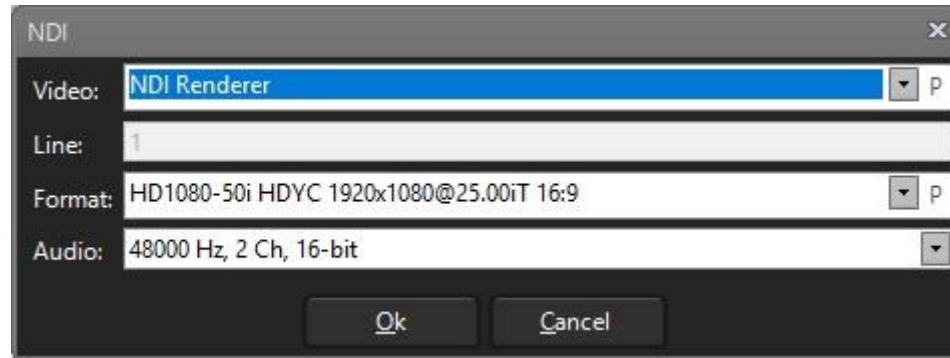
By clicking on OK you will start the Video Device capture for this channel with the current parameters.

if the desired video target is set correctly the  button turns to yellow.

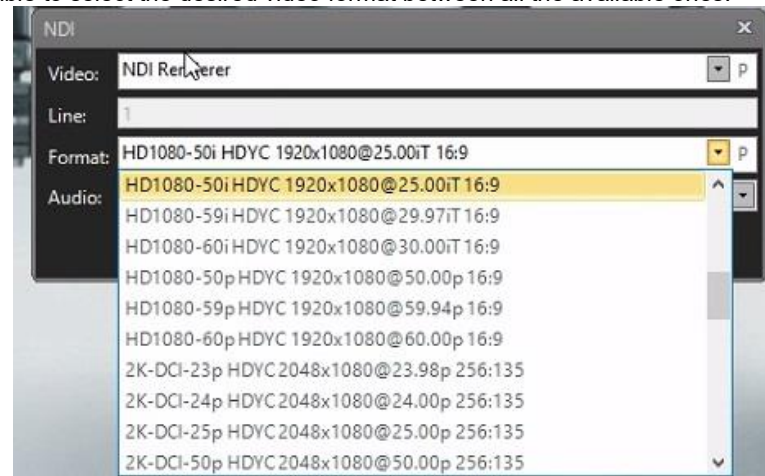
5.3.3 NDI STREAM SETTINGS

If you want to generate a NDI stream enable the button . By selecting this target you will generate a NDI stream with the Video Signal assigned to this MULTICROSS CONVERTER channel..

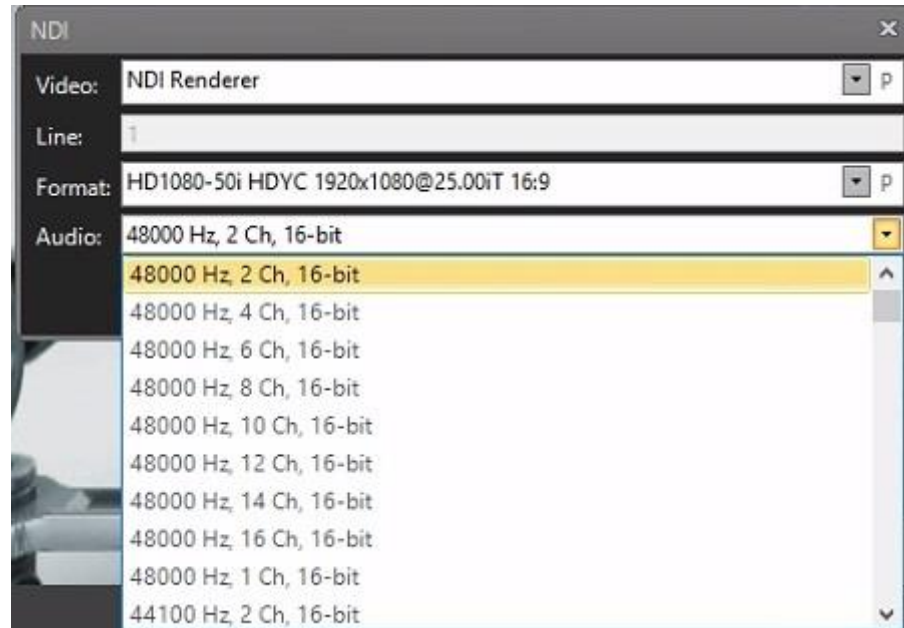
Press  to enter in the NDI Target settings:
The Video field shows you NDI Renderer is enabled.
The Line field in NDI target is disabled.



By expanding **Format** drop-down menu you will be able to select the desired video format between all the available ones:



By expanding **Audio** drop-down menu you will be able to select the desired configuration that includes: sample rate, channels number and bitrate.



The clickable **P** button allows you to set for additional parameters if availables
The clickable **R** button allows you to refresh the connection with the selected stream.


By clicking Cancel you will not apply the setting changes.
By clicking OK you will start the Video Device capture for this channel with the current parameters.

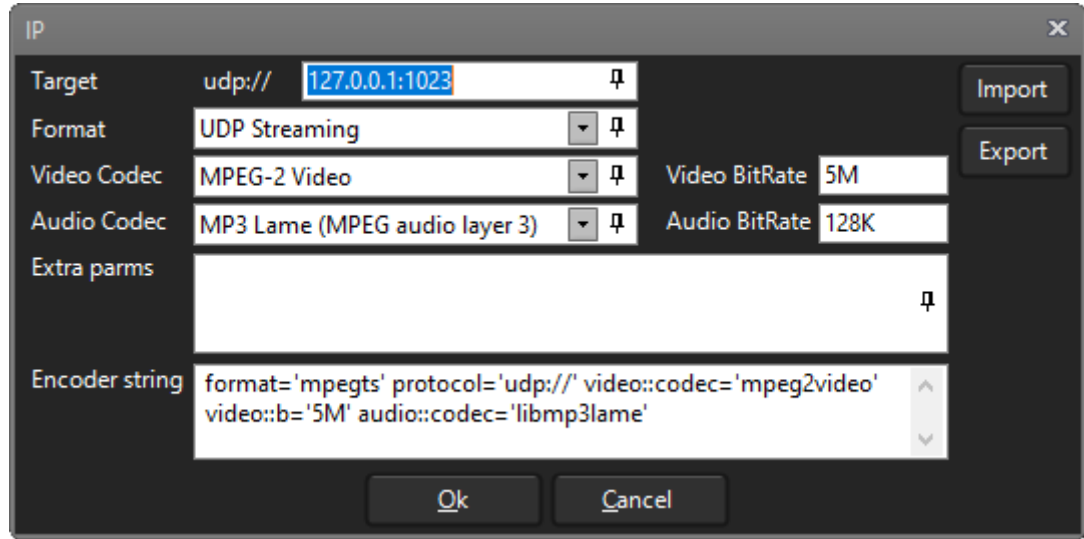
if NDI target is set correctly the  button turns to yellow.

5.3.4 IP STREAM SETTINGS

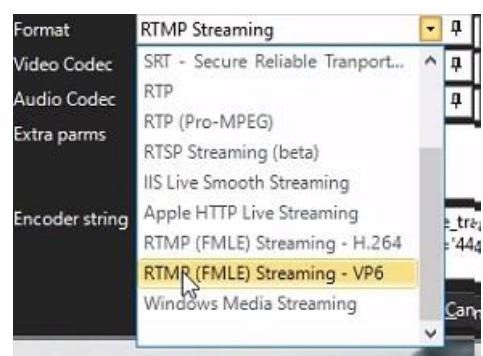
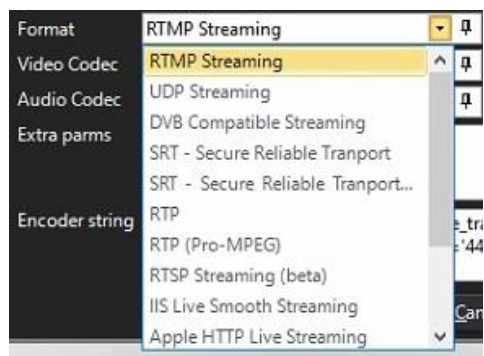
If you want to generate an IP stream enable the button .

By selecting this target you will generate a NDI stream with the Video Signal assigned to this MULTICROSS CONVERTER channel..

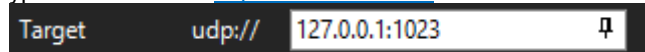
Press  to enter in the IP Target settings:



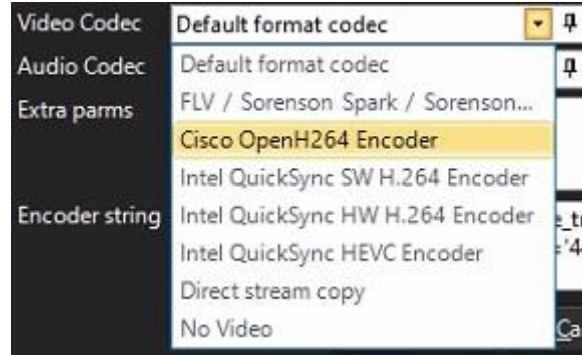
Before typing the streaming URL select the desired streaming protocol from Format menu:



After streaming protocol selection, type in Target field the desired streaming URL.
In this example we have chosen the UDP protocol and we typed this UDP Url: <udp://127.0.0.1:1023>



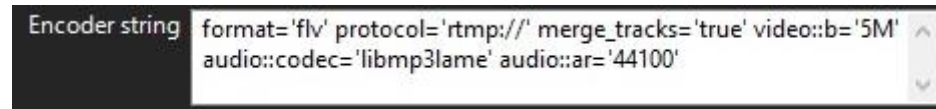
By expanding Video Codec menu select the desired format:



If needed, type extra parameters:



In the following no editable field you can read a resume of the all previous set parameters:




By clicking on this  button you will open a window to view all the actual video stats and video

if IP target is set correctly the  button turns to yellow.

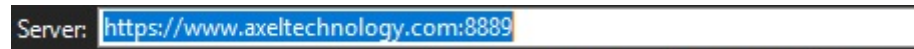
5.3.5 RTC STREAM SETTINGS

If you want to start a **WebRTC** transmission enable the button . By selecting this target you will generate a WebRTC transmission with the Video Signal assigned to this MULTICROSS CONVERTER channel..

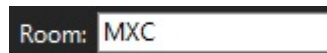
Press  to enter in the RTC Target settings:



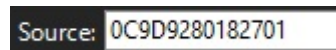
In the **Server** field type the URL of your WebRTC server if you have your own one available, If you do not have one, you can use Axel WebRTC server by typing in this parameter the following link: <https://www.axeltechnology.com:8889> as shown in the following picture:



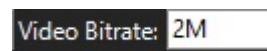
Room parameter is a sort of transmission lable. MXC automatically assign a default one, but you could change it with a desired customized one:



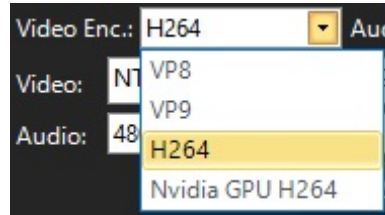
Source parameter is an automatic 14 digits exadecimal code generated by MultiCross Converter to identify this specific stream inside multiple streams of the same Room:



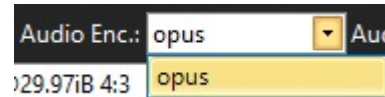
Inside **Video Bitrate** if needed you can change the current value and the unit prefix:



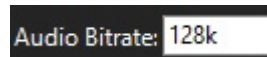
By opening the **Video Enc.** drop-down menu you can change and select the desired Video Coding format:



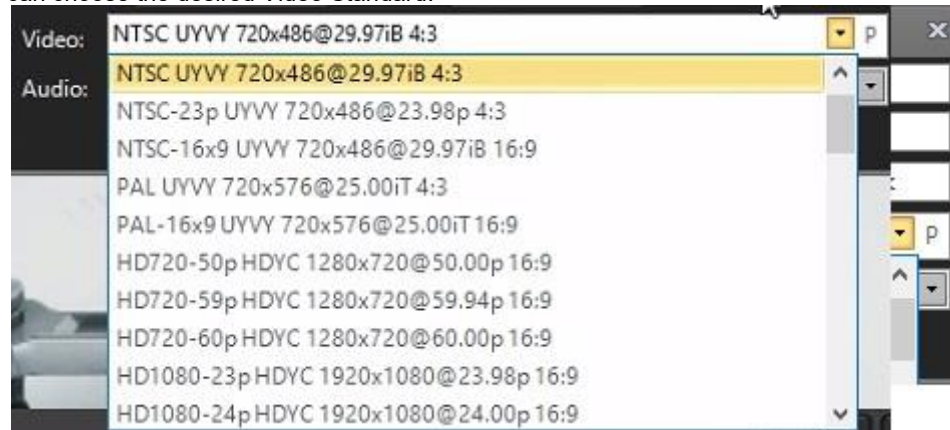
Audio Enc. parameter is set on OPUS codec by default:



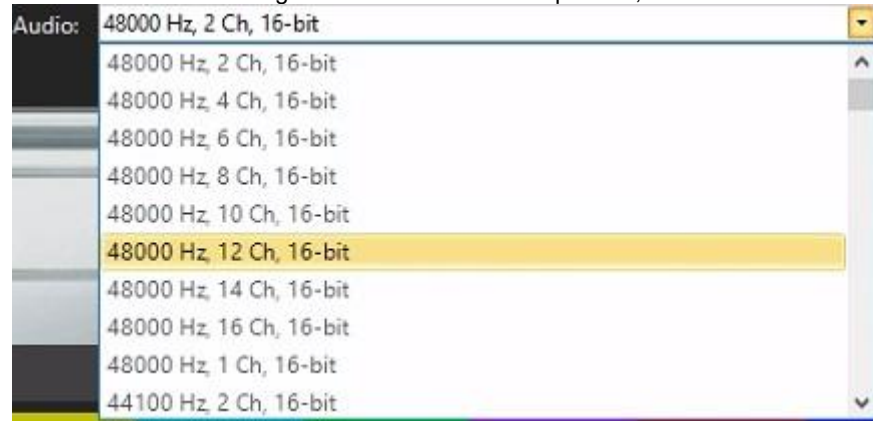
Inside **Audio Bitrate**, if needed you can change the current value and the unit prefix:



By opening the **Video** drop down menu you can choose the desired Video Standard:



By opening the **Audio** drop-down menu you can choose the desired configuration that includes sample rate, channel numbers and audio bit-rate:



6 LOGS

From this useful section you can read all the MULTICROSS CONVERTER logs.

The screenshot shows the MultiCrossConverter application interface. On the left is a calendar for September 2019, with dates 26, 27, 28, 29, 30, 2, 3, and 4 highlighted in red. Below the calendar are filter options: NONE, INFO, MultiCrossConverter, and 1. On the right is a log window titled 'Log' with 70 (70) entries. The log table has columns: DateTime, Application, LogType, and Message. The expanded error message at the bottom reads: 'Fill IP input source connection exception: La directory o il file è danneggiato e illeggibile. (Eccezione da HRESULT: 0x80070570)'.

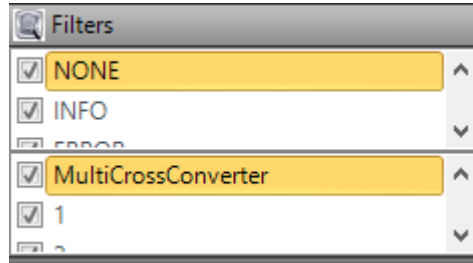
DateTime	Application	LogType	Message
04/09/2019 12:14:10	2	EXCEPTION	Fill IP input source connection exception: La directory o il file ...
04/09/2019 12:13:57	MultiCrossCon...	INFO	The MultiCrossConverter settings has been saved.
04/09/2019 12:13:57	1	INFO	Fill IP output source successfully.
04/09/2019 12:13:44	MultiCrossCon...	INFO	The MultiCrossConverter settings has been saved.
04/09/2019 12:13:44	1	ERROR	Fill IP output source failed.
04/09/2019 12:13:43	MultiCrossCon...	INFO	The MultiCrossConverter settings has been saved.
04/09/2019 12:13:27	MultiCrossCon...	INFO	The MultiCrossConverter settings has been saved.
04/09/2019 12:12:49	MultiCrossCon...	INFO	The MultiCrossConverter settings has been saved.
04/09/2019 12:12:34	MultiCrossCon...	INFO	The MultiCrossConverter settings has been saved.
04/09/2019 12:12:34	1	INFO	Fill IP output source successfully.

Select from the top left calendar the desired date. In Red days you will find detected errors:

This is a close-up of the calendar interface for September 2019. The dates 26, 27, 28, 29, 30, 2, 3, and 4 are highlighted in red, indicating detected errors.

From Filters menu you can active some log display modes

Inside first subgroup select all the desired log types that you want to view between: NONE, INFO, ERROR, RECEIVED, SENT, EXCEPTION, TCPIP, DEBUG, DEBUG VERBOSE, WARNING.

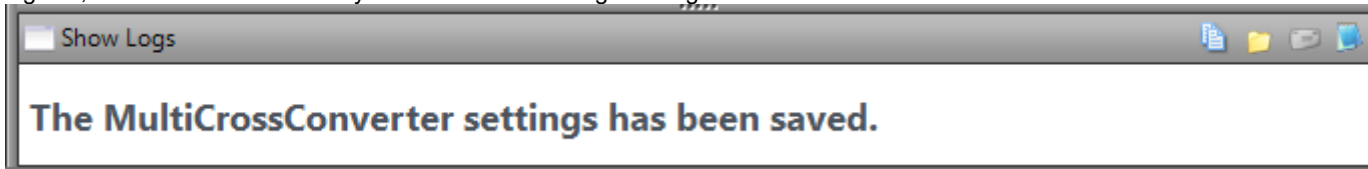


Inside second subgroup select all the desired MultiCrossConverter channels for which you want to view logs:
 By checking MultiCrossConverter you will enable logs viewer of MultiCross Converter general settings.
 By checking on the numbers below you will view the logs for the selected channel numbers: 1, 2, 3, 4, 5.

The main Log tab is the logviewer:


Log				70 (70)
DateTime	Application	LogType	Message	
04/09/2019 12:14:10	2	EXCEPTION	Fill IP input source connection exception: La directory o il file ...	
04/09/2019 12:13:57	MultiCrossCon...	INFO	The MultiCrossConverter settings has been saved.	
04/09/2019 12:13:57	1	INFO	Fill IP output source successfully.	
04/09/2019 12:13:44	MultiCrossCon...	INFO	The MultiCrossConverter settings has been saved.	
04/09/2019 12:13:44	1	ERROR	Fill IP output source failed.	
04/09/2019 12:13:43	MultiCrossCon...	INFO	The MultiCrossConverter settings has been saved.	
04/09/2019 12:13:27	MultiCrossCon...	INFO	The MultiCrossConverter settings has been saved.	
04/09/2019 12:12:49	MultiCrossCon...	INFO	The MultiCrossConverter settings has been saved.	
04/09/2019 12:12:34	MultiCrossCon...	INFO	The MultiCrossConverter settings has been saved.	
04/09/2019 12:12:34	1	INFO	Fill IP output source successfully.	

By selecting the desired log line, in the subwindow below you can read the full log message



Below some buttons that allow you to make some operation with the selected log:

 COPY TO CLIPBOARD

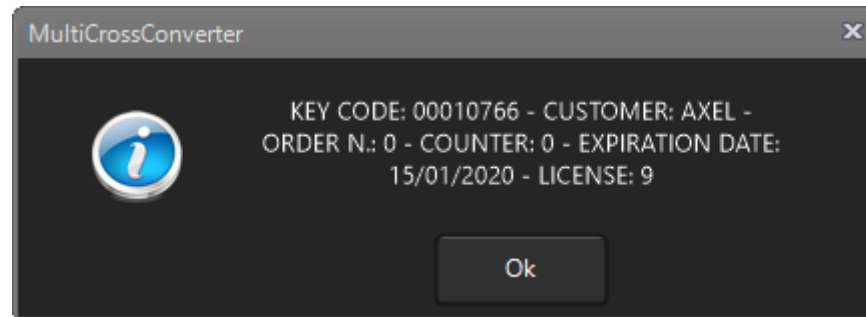
 OPEN FOLDER WITH EXPLORER

 SEND LOG TO SUPPORT

 OPEN WITH NOTEPAD

7 LICENSE

This button allows you to fastly consult all the details connected with your license and your dongle serial number.



8 ABOUT

About section gives you information about Axel Technology – MultiCross Converter developer company.



