USER MANUAL

RECORD-IT! MEDIA 1.0.04

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Some symbols may have more than one interpretation by professionals unaccustomed to their usage.

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1. INTRODUCTION

RECORD-IT! MEDIA is a Panlab product specifically designed to record digital videos in laboratories and scientific environments.

RECORD-IT! MEDIA can simultaneously record the live images of up to 16 cameras into independent digital video files. The user can select the quality level of each video channel to optimize performance and minimize the hard disk space required.

RECORD-IT! MEDIA also provides a Player for the visualization of the recorded videos.

Both video recording and video playing can be synchronized with a third-party system (contact us for technical information).

Videos generated by RECORD-IT! MEDIA can be easily integrated with the Panlab family of video-tracking products (Smart 3.0 and Smart IO)[1].

Specific hardware and accessories like cameras, camera support, camera lens, video cables, hubs, etc. are not included and will need to be purchased separately.

[1] Some specific systems may require the installation of additional video decoder modules to process the video files generated by Record-It! Media. Smart only works with videos with <40 fps frame rate.

2. INSTALLATION OVERVIEW

2.1. Requirements

The minimum computer specifications depend on the number of cameras, the specifications of the cameras and quality settings.

If the RECORD-IT! MEDIA is combined with another application, please also check the computer specifications for that application.

Recommended computer specifications needed to use RECORD-IT! MEDIA with up to 16 cameras may be found below:

- Intel Core™ i7-10700 (10th gen) processor or superior (Celeron processor not supported).
- 16 GB DDR3 RAM or superior.
- 1 TB hard drive or superior (minimum 512 GB).
- C: SSD Drive SATA 2 3GB/s or faster, 250GB or greater.
- D: Drive SATA 3 6GB/s or faster, 500GB or greater.
- Display: 1280 x 720 pixels and 32-bit true color. Screen text size must be set at 96 DPI (100%).

- IMPORTANT: Issues may arise if using a computer with VIA chipsets in the PC motherboard. It is recommended to use a computer without the VIA chipset.

- USB ports:
  - One free USB port for the software USB flash key.
- One free PCI Express x4 slot.
- Expansion Hubs USB3 x4 RootHost:
  - Four free USB 3.0 ports are needed for the connection of 4 HUBs for 4 USB camera each.

Operating system supported:

- Microsoft® Windows® 11 64 bits.
- Microsoft Office 64 bits

Network:

- When working with IP Network cameras, the network infrastructure (LAN/WAN) and performance of your experimental facilities is an important point to be considered. If bandwidth bottlenecks occur, streaming video can show jitter, delay, or corruption. This could result in the video not getting recorded or showing aberrant duration.

2.2. Installing the software

RECORD-IT! MEDIA software is delivered as a single USB flash drive. The USB flash drive contains the software installation tool, the User Manual in PDF format, and other components required to work in specific conditions.

Due to security reasons of the Windows® operating system, a user with administrative rights is required to install the software and other components. Please contact your IT staff before installing the software.

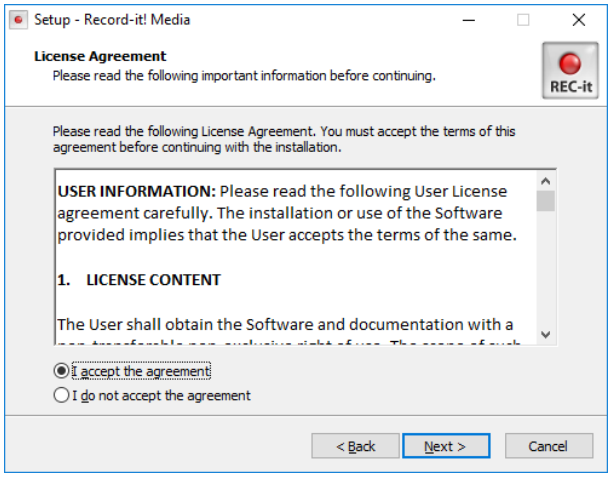
In order to install the software on the PC, follow the next steps:

- Plug the USB flash drive in a free USB port of your computer and wait until Windows® installs it as a new removable drive.
- Access the new removable drive detected and execute the PANLAB.EXE file. The following window will be shown:

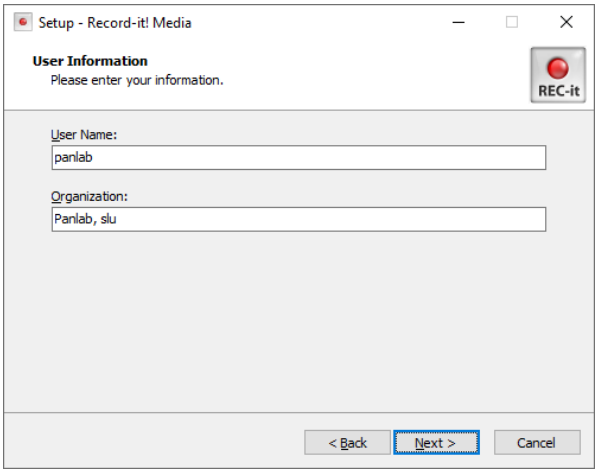
- Click on the option **Install Record-it! Media v1.0.04**. An installation wizard will be shown.

- Click on the [Next] button to start the software's installation.

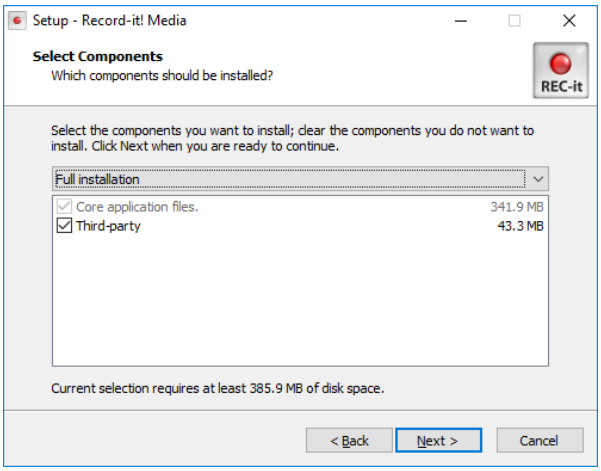
- Check the **I accept the agreement** option and click on [Next] button to continue.



- In the following **User Information** window introduce the name of the user and the company in the correct field. After this, click on [Next] button to continue.



- In the following **Select Components** window check that the option Full installation is selected. After this, click on [Next] button to continue.



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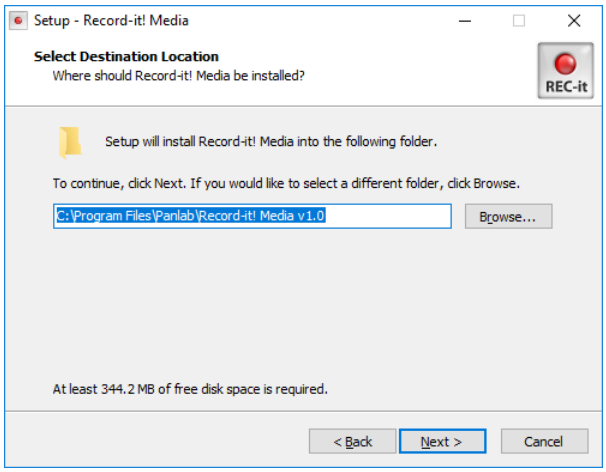
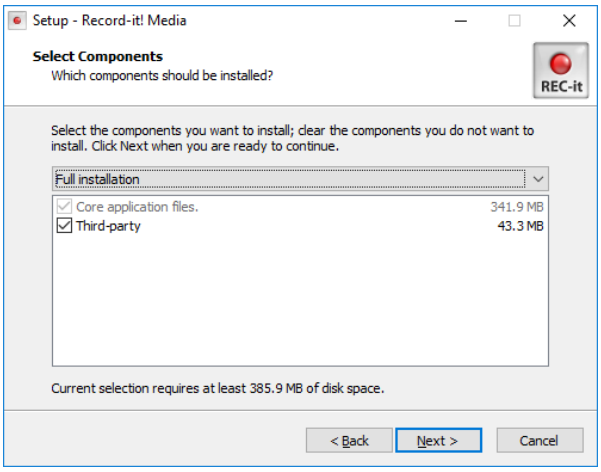
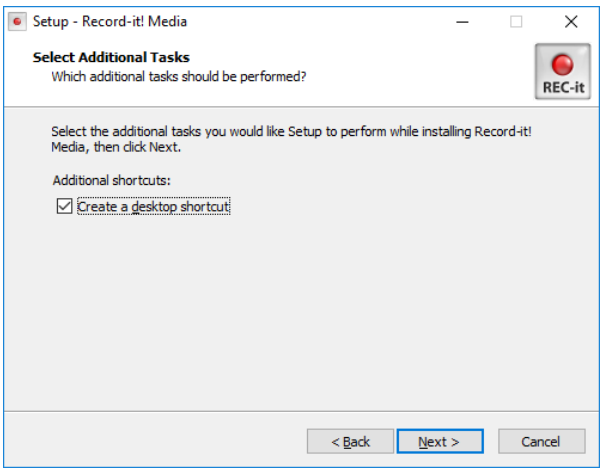
- Select the location where to install the application. By Default, RECORD-IT! MEDIA saves the application in C.\Program Files\Panlab\Record-it! Media v1.0. After this, click on [Next] button to continue.



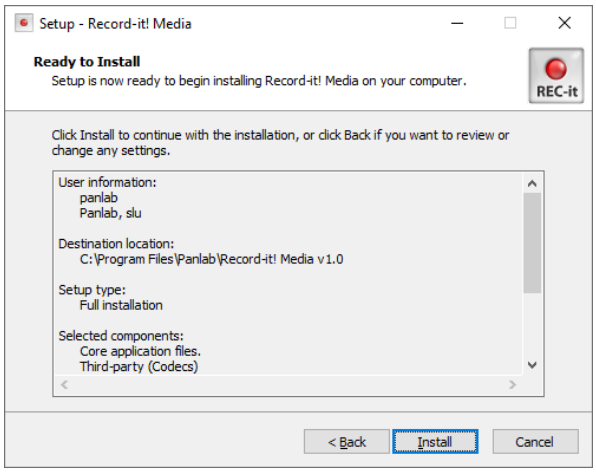
- In the next **Select Components** window check that the Full installation option is selected. After this, click on [Next] button to continue.



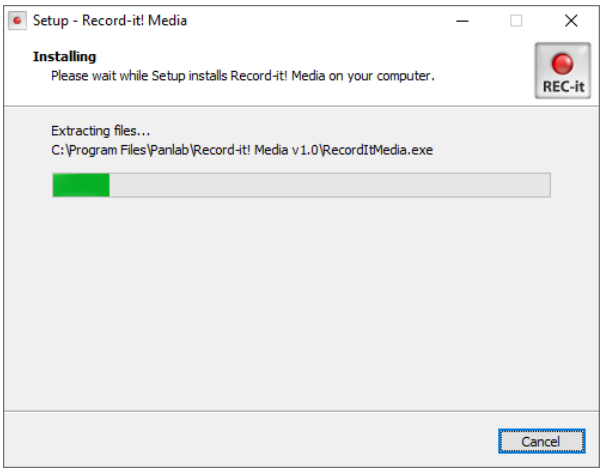
- In the following **Select Additional Tasks** you can check the **Create a desktop shortcut** option. After this, click on [Next] button to continue.



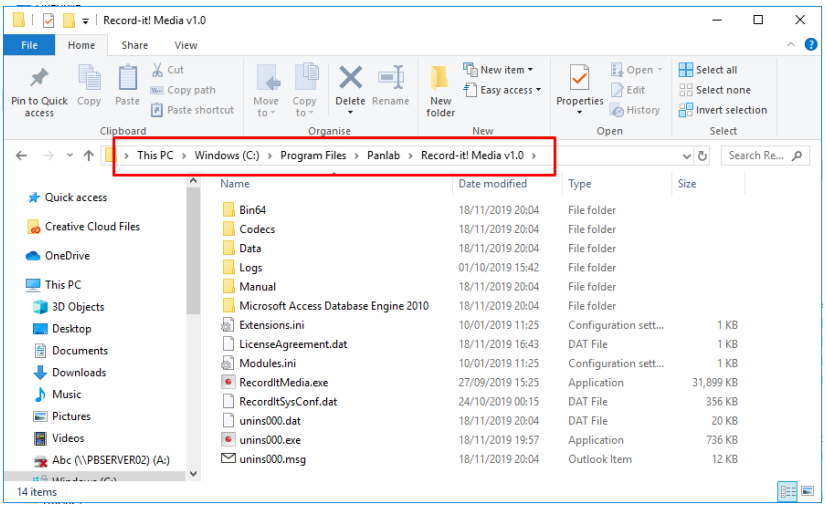
- The Ready to Install panel will be shown. Click on [Install] button to continue.



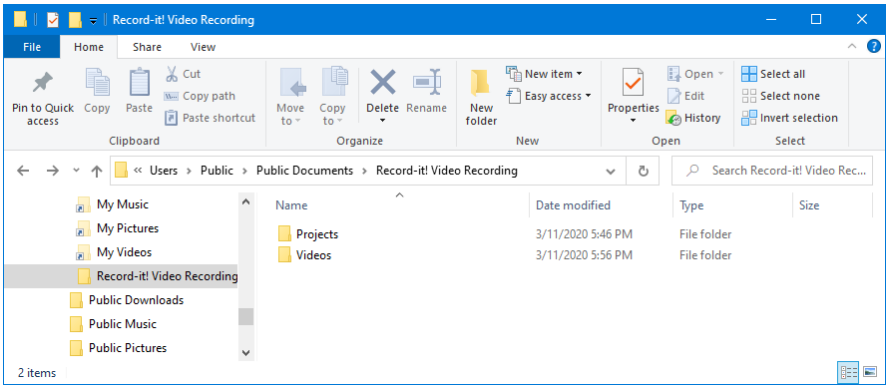
- The **Installing** panel informs about the installation process.



- During this process the software is installed in a new folder called [Panlab\Record-it! Media v1.0], created under the "C:\Programs Files" folder. The location of the software is independent of the data folder, which is defined by the user using the corresponding options of the program.



- Another repository folder named **Record-it! Video Recording** is created in the **Public Documents** folder.



- Once the installation is finished, the following panel is displayed.

- A new shortcut  will appear on your desktop. Use it for executing the program later.

A PDF reader must be installed on your computer in order to view the User's Manual. Adobe Acrobat Reader is provided in the installation key. If needed, click on **Install Acrobat Reader** button, and follow the steps to install it.

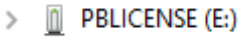
Use the **Contact us** option to email our team directly with questions.

2.3. The USB protection key

A software protection key is a device used to prevent software from unlawful use. The license key is connected to the computer via a free USB 2.0 port. Only one key is provided per purchased license, this is a single-seat license for recording video. If you are interested in recording from multiple computers, purchase of additional license keys is required.

The license key is needed for video recording only, not for using the RECORD-IT! MEDIA player.

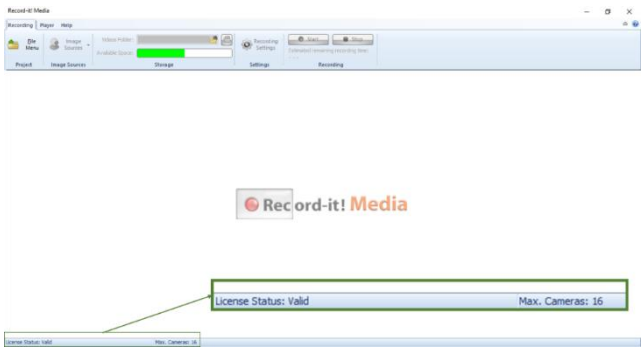
To make use of the protection key, make sure it is plugged into the USB 2.0 port before RECORD-IT! MEDIA has started.



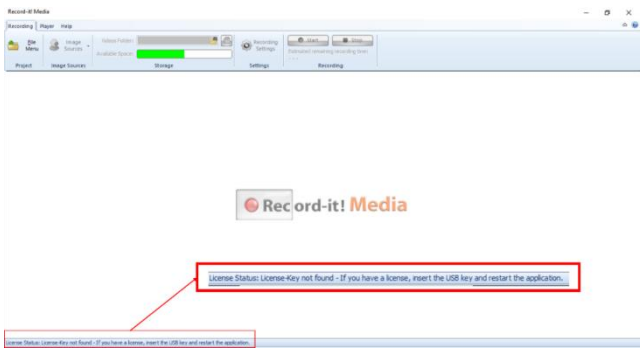
Please **DO NOT rename** the USB unit (its name should always be PBLICENSE).

Please **DO NOT remove or modify any file** stored within the USB flash key, especially the regkey.dat file which stores the information regarding your license of use.

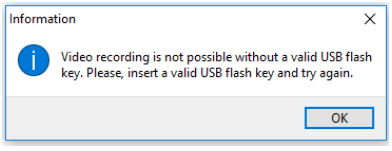
The **License Status** will then be shown as **Valid** in the status bar.



If the license key is not detected by the computer, the status bar will show **License-Key not found** as **License Status**.



And the following message will appear when clicking on one of the START recording buttons:

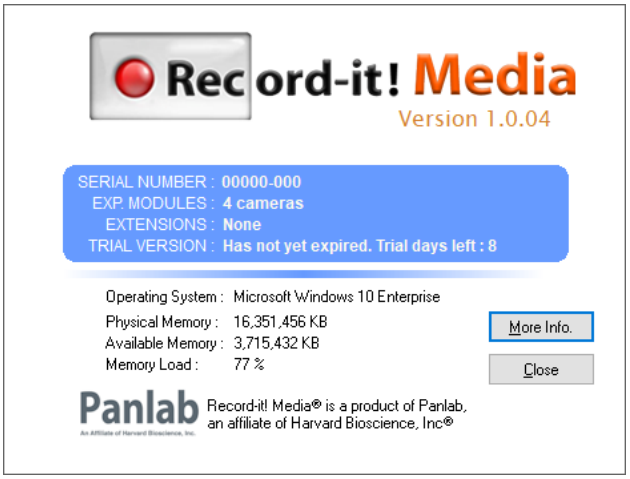


2.4. Testing Record-IT! Media: the Trial Period

This section only applies if you have acquired a trial version of Record-IT! Media available for download at http://www.panlab.com/.

The trial period is 15 days counted from the first time Record-IT! Media is executed and is intended for testing purposes. During this period, Record-IT! Media is limited to 4 cameras and 4 min recording time per video. In case the user doesn't currently have a camera compatible with the application, Record-it! Media provides simulated image sources (see 2.5.6)

The trial period information can be accessed throughout the Help About menu option:



The "Trial Version" field shows the status of the trial period. Once the trial period expired, a warning message is shown, and Record-IT! Media will no longer execute.

If required, in special cases, the trial period can be extended upon special request. Please contact your dealer for further details.

2.5. Supported cameras for video recording

RECORD-IT! MEDIA processes the images (frames) coming from the connected image sources (cameras).

The cameras supported by RECORD-IT! MEDIA are:

- Digital USB cameras, Webcams, WIA cameras.
- Analogic cameras (requires an analog-digital converter). Multi-camera mode is not possible with analogic cameras. In other terms, only 1 image source/camera can be detected.
- IP Network cameras.

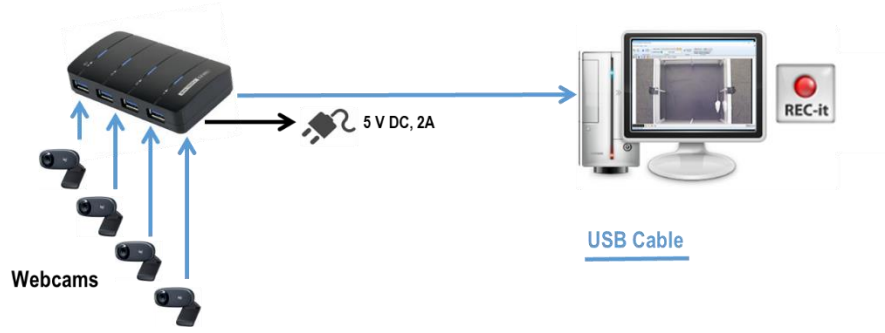
RECORD-IT! MEDIA also provides simulated live image video sources for demo purposes.

2.5.1. Webcam

Standard USB webcams are one of the commonly used live image sources. They offer a reasonable trade-off between image quality and cost. However, due to technical limitations of the USB communication protocol, webcams cannot be used with long distances between the computer and the arenas. RECORD-IT! MEDIA can record from up to 4 webcams simultaneously at 16 fps as maximum frame rate. If more than one webcam is to be connected, we recommend use of a specific 4-port USB Hub (Renkforce; 4 Port USB 3.0 HUB).

From Panlab-Harvard Apparatus, we recommend the use of the **Logitech HD C9xx** series of webcams.

Please refer to the manufacturer instructions to install the drivers of the webcam and avoid installing the generic drivers that Windows may try to install by default.



Other standard USB webcams may be installed following a similar procedure which is described in detail in the Manual.

If the recordings are to be processed through an external video-tracking system, please note that USB Webcams may include auto-adjustment tools for focus, brightness, contrast, and face tracking. Make sure that these options are disabled before using your webcam for video recording.

2.5.2. Digital USB 3.0 cameras and USB cables

Even through RECORD-IT! MEDIA can work with several models of digital USB 3.0 cameras (provided that the correct driver is correctly installed), we only ensure total compatibility with the digital USB 3.0 cameras manufactured by Basler.

Connecting a USB 2.0 camera to a USB 3.0 port will not increase the performance of the camera. Similarly, connecting a USB 3.0 camera to a USB 2.0 port will make the camera work as a 2.0 camera.

Using a USB Hub to expand a USB port to 4 ports, it will be possible to connect up to 4 Digital USB 3.0 cameras simultaneously using RECORD-IT! MEDIA. On the other hand, in order to connect more than 4 cameras, an expansion card (PCIe) will be necessary. For example, one PCIe connected to 4 USB Hub will allow to connect up to 16 Digital USB 3.0 cameras simultaneously using RECORD-IT! MEDIA. In this case, please follow the manufacturer instructions to install it. Please be aware that you will need to power the PCIe connecting it to a cable from the power unit within the PC, so it would be better to use a slot near the power unit. Ask your IT Department if you need further assistance.

Depending on the configuration purchased we provide 3 USB cable length options with our cameras: 3 m, 5 m or 8 m (5 m cable with a 3 m extension cable).

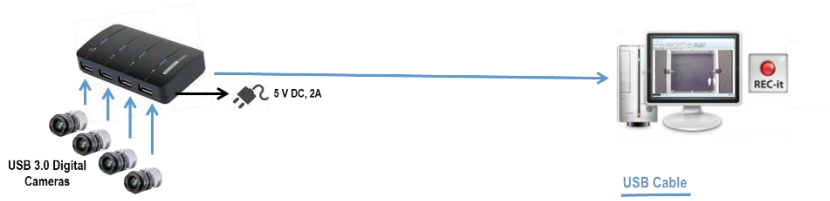
Table 2 reports the maximum frame rate allowed for each camera model, depending on the number of cameras simultaneously connected:

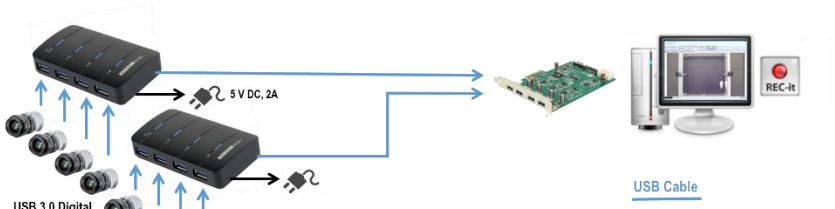
Table 1: USB 3.0 cameras

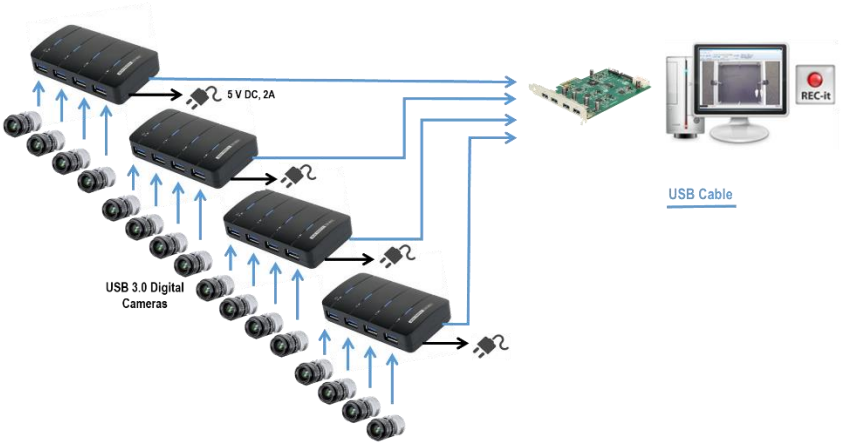
REFERENCE	SENSOR	RESOLUTION	FPS per number of cameras			
			1	2-4†	5-8*†	9-16*†
CAMDC3COLOR	Color	1280X960	25	20	-	-
		640X480	25	20	16	16
CAMDC3BW	Monochrome	1280X960	25	20	-	-
		640X480	25	20	16	16

†Need 1 to 4 USB 3.0 Hub

*Need PCIe USB 3.0


5 V DC, 2A
USB 3.0 Digital Cameras
REC-it
USB Cable

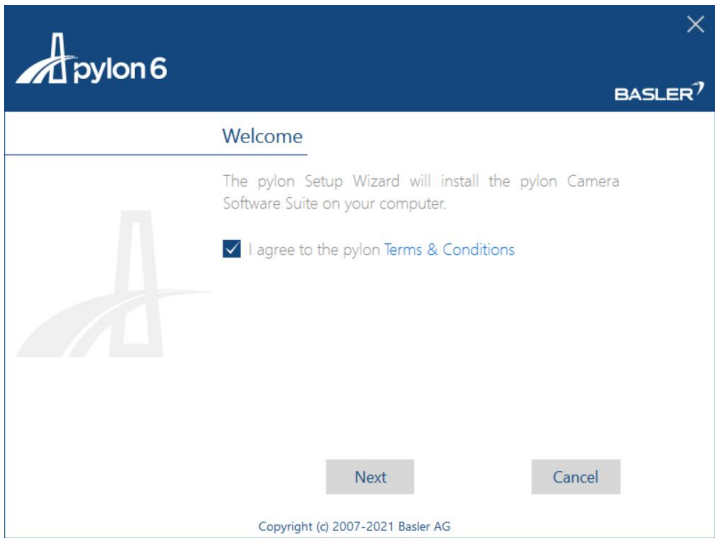

5 V DC, 2A
USB 3.0 Digital Cameras
REC-it
USB Cable


5 V DC, 2A
USB 3.0 Digital Cameras
REC-it
USB Cable

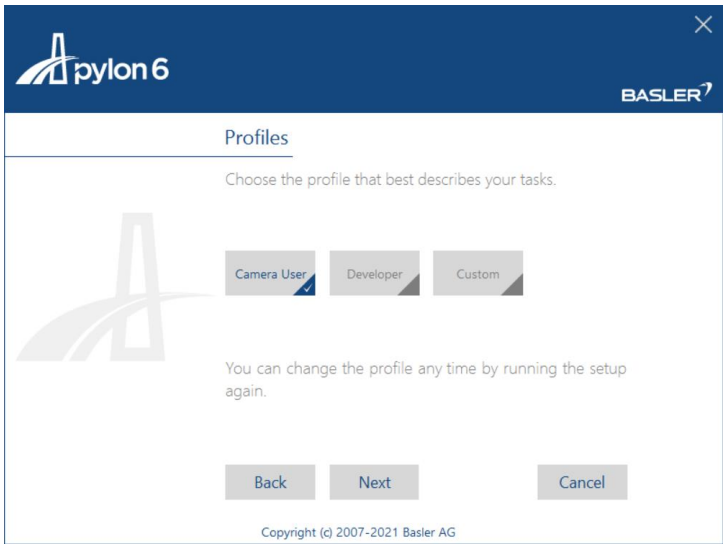
2.5.2.1. Installing the drivers of the Basler USB digital cameras

1. Unpack the Device
2. IMPORTANT: Do not plug the camera into any USB port before step 7 of this installation guide.
3. Please make sure to have administrative privileges for the computer where the device will be installed. Contact your IT staff to ensure you have administrative rights before continuing with this procedure.
4. Plug the installation key of Record-It! Media into a USB 2.0 port and launch the installation tool (PANLAB.EXE).
5. Select the Hardware Drivers option.

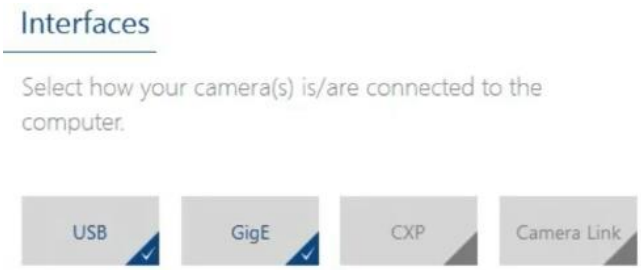
6. Enter the **Basler Digital 3.0 – Basler GigE Vision** folder and execute the file.
7. Read and accept the **Terms & Conditions**. Then click on **Next**.



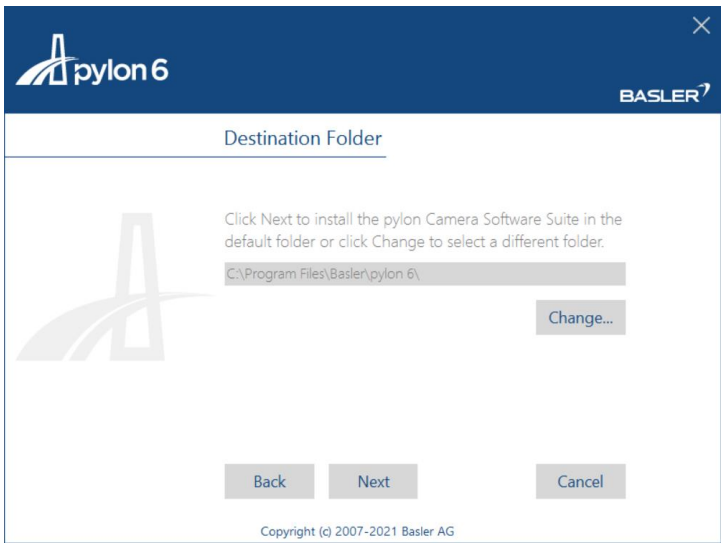
8. Select the **Camera User** profile



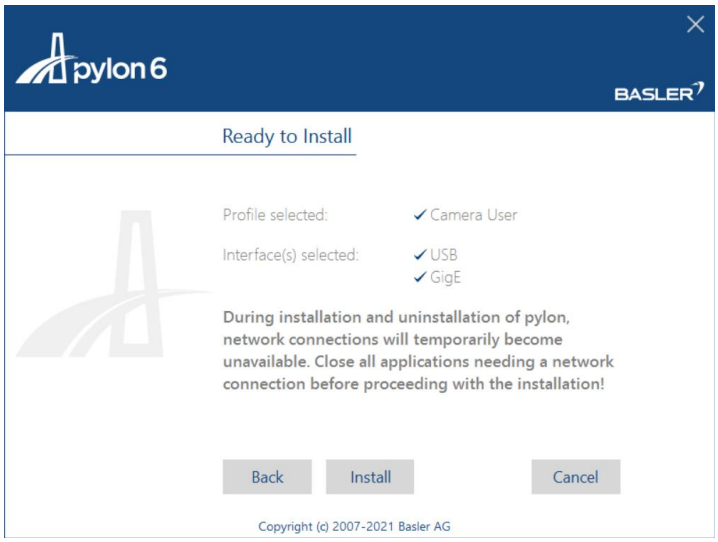
9. In the Interfaces window, select only USB and GigE. To avoid lagging problems during the use of the device in SMARTIO, do not select CXP or Camera Link. Click on **Next.**



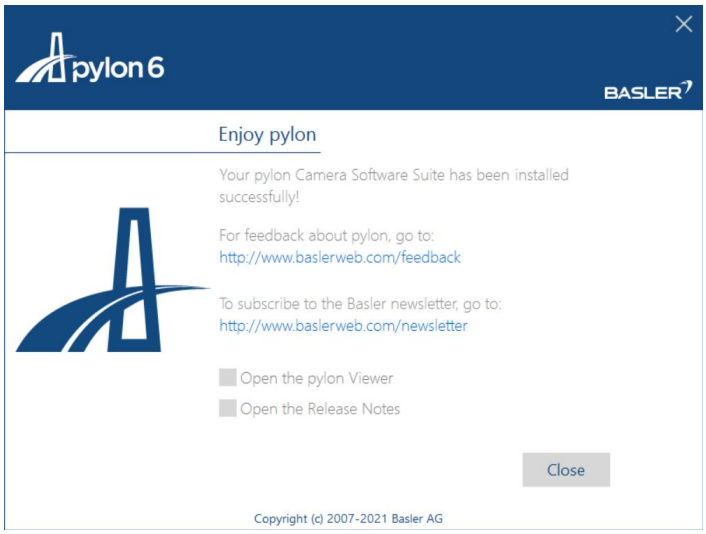
10. Specify the destination folder and click on **Next**



11. Click on **Install** to proceed with the installation.



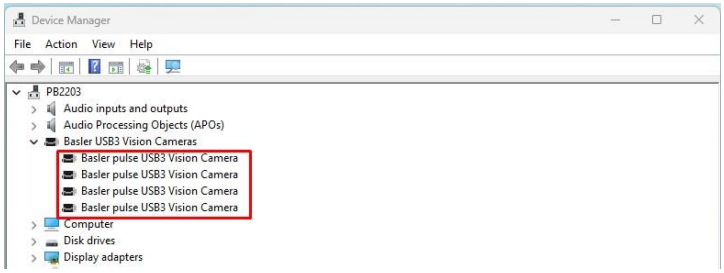
12. Click on the **Close** button to finish the installation. Restarting the computer is advised.



13. Plug the device to a free USB port.

14. Windows 11 will automatically install the cameras. If working with Windows 10, wait for the Windows Device installation assistant to launch and follow the default steps until finishing.

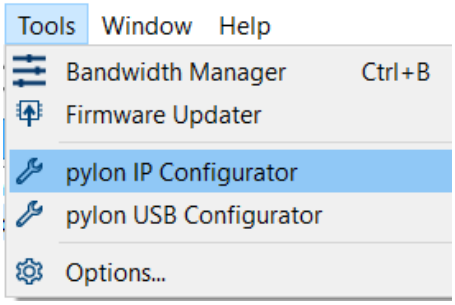
15. In Device Manager, check that the cameras are detected.



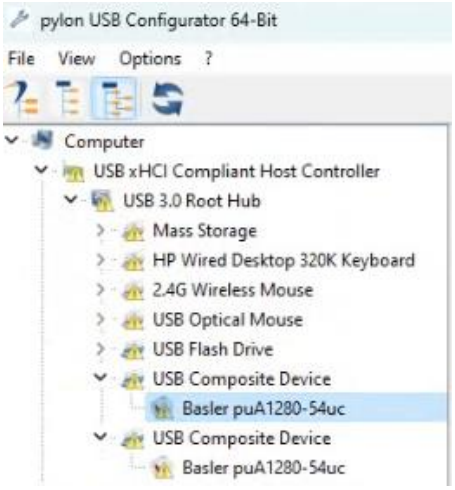
2.5.2.2. Configuring Basler USB digital cameras with Pylon Viewer

Configuring a new camera model

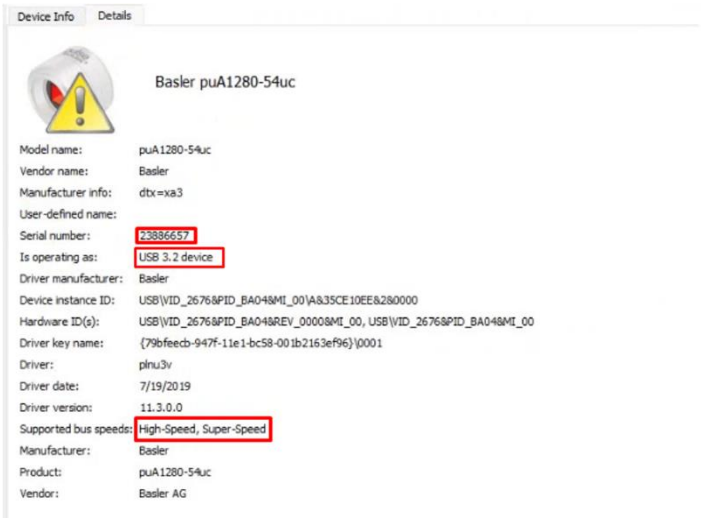
1. Select Tools > Pylon USB Configurator



2. Identify the cameras connected: the path may change whether the camera is connected directly to the motherboard, through a USB Hub or an additional PCIe card.

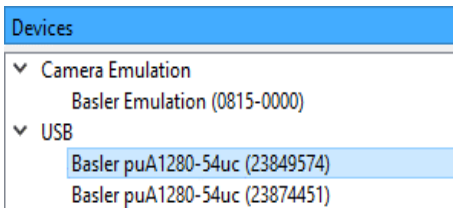


3. Click on the camera and go to the **Details** table.
4. Check that the Serial Number of the camera is correct, that the **Is operative at:** field shows **USB 3.*n* device** and that **Supported bus speeds:** indicates **High-Speed, Super-Speed**.

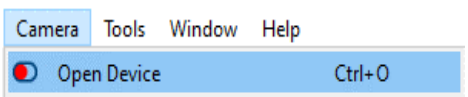


If the **Is operative at:** field shows **USB 2.*n* device**, the speed of the bus would not be enough to support the performance of the camera(s). Remove the USB cable from the USB 2 port and connect it to a USB 3 and restart from step 12 of chapter 2.5.2.1.

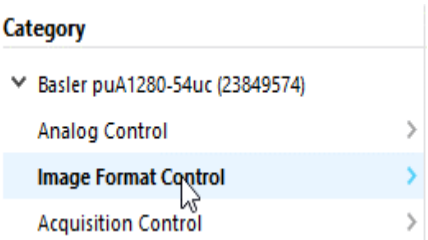
5. Click on **File > Exit** to close the USB configurator
6. Under the **Devices** section, select the camera and identify the camera by its serial number;



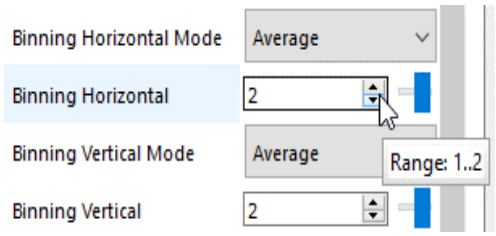
7. Select Camera > Open Device



8. Select Category > Image Format Control

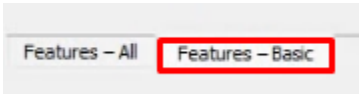


9. Insert the value 2 in Binning Horizontal and Binning Vertical

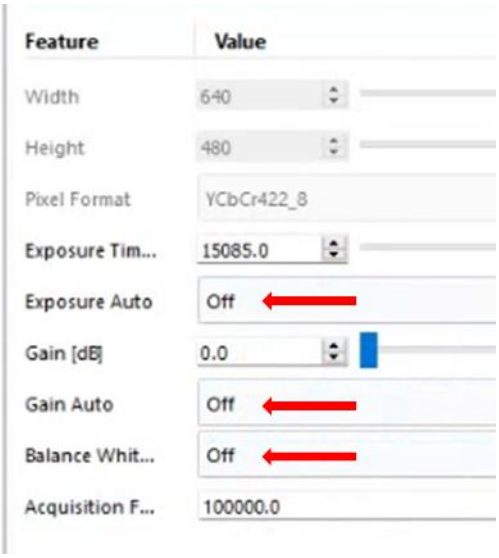


10. Click on  on the top main menu to open the preview of the camera

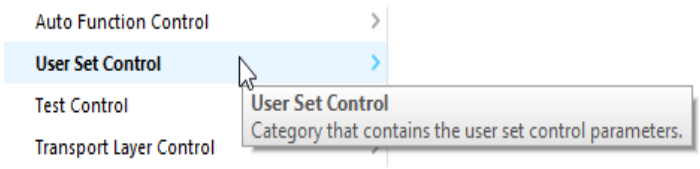
11. Click on the **Features – Basic** tab shown at the bottom left of the Pylon application main window.



12. Set Exposure Auto, Gain Auto and Balance Whites on OFF



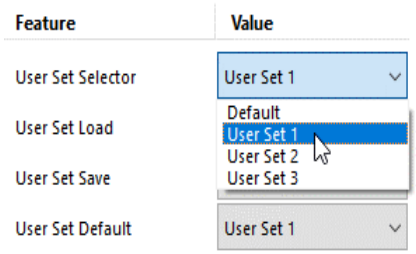
13. Set the optimal Exposure Time and Gain [dB] to have a clear and definde image.
14. Click on  on the top menu to stop the preview.
15. Come back to the Features – all tab and select Category > User Set Control



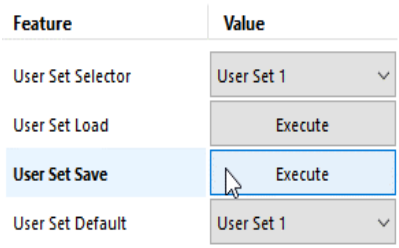
Different settings may be saved in different User Sets if the same camera is intended to be used with different light conditions. In

SMARTIO it will be possible to select the correct setting when defining the image settings

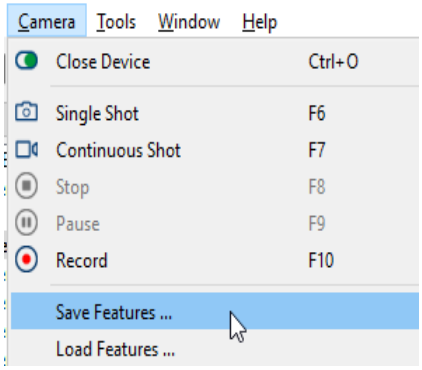
16. Select User Set Selector > User Set 1 and User Set Default > User Set 1



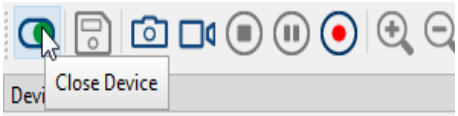
17. Select **User Set Save > Execute** to save the configuration



18. Select **Camera > Save Features** and indicate name and path of the configuration file



19. Select Camera > Close Device to exit

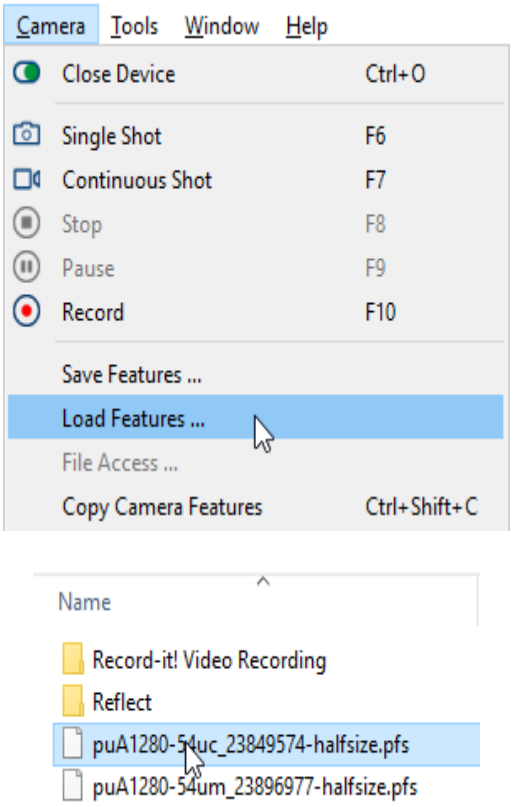


2.5.2.3. Configuring a camera of an existing model

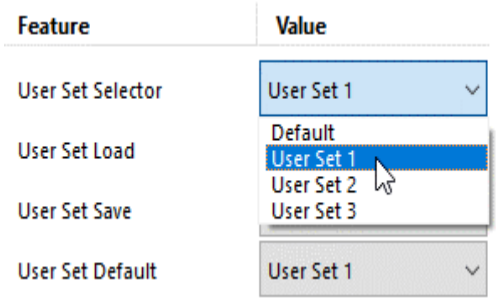
If using multiple cameras of the same model, follow the next steps to apply the same configuration to all the cameras

1. Follow the Steps 1-5 of the previous section

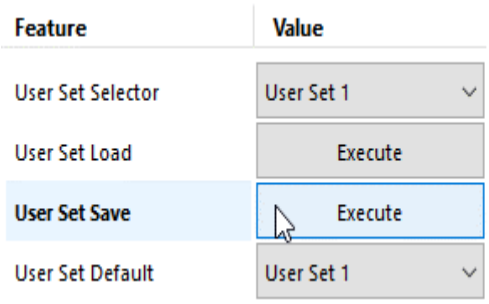
2. Select **Camera > Load Features …** to load a pre-exisiting configuration file



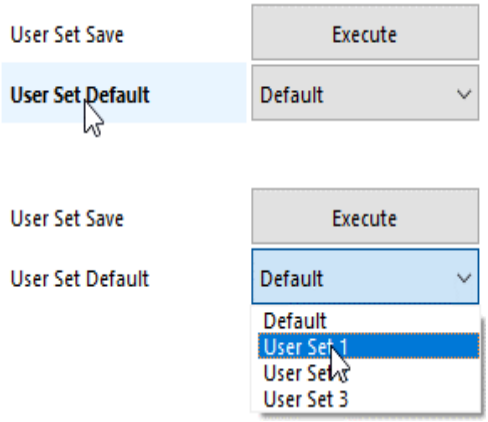
3. Select User Set Selector > User Set 1



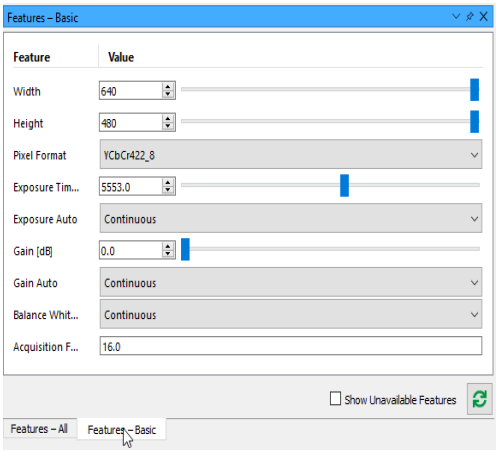
4. Select **User Set Save > Execute** to save the configuration



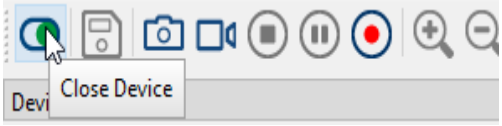
5. Select **User Set Default > User Set 1** to define this configuration as default



6. Select the tab **Features – Basic** to visualize a summary of the selected configuration



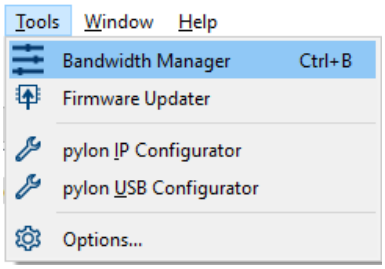
7. Select Camera > Close Device to exit



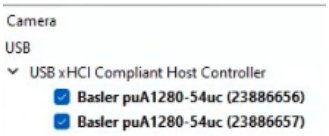
2.5.2.4. Configuring the correct bandwidth/frame rate for each camera

The factory configuration of the cameras are set by default to high resolutions. This seetings need to be lowered for an optimal use with our video solutions. The following step is very important so to ensure the performance of the video recording process (frame rate/resolution).

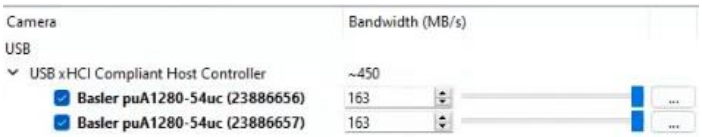
1. Once configured all the cameras connected to the PC, open **Tools > Bandwidth Manager**



2. Select all the cameras



3. The bandwidth of the USB Controller (or the Hub) and the bandwidth per each camera are shown in the column **Bandwidth (MB/s).** The sum of all the bandwidths of the cameras must be lower of the total bandwidth of the USB Controller. In this case, 163 MB/s per two cameras is 326 MB/s total, which is lower than 450 MB/s.

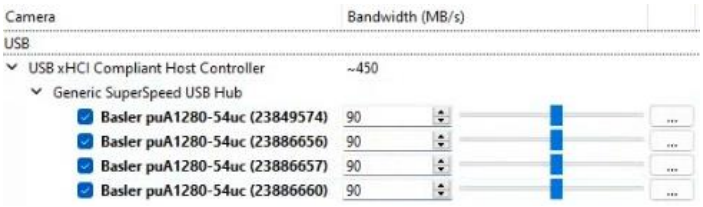


If the sum of the bandwidth of all the cameras exceeds the bandiwdth of the USB controller, divide this last value for the total number of cameras + 1.
In this example, the four cameras use a total bandwidth of

163/s * 4 = 652 MB/s

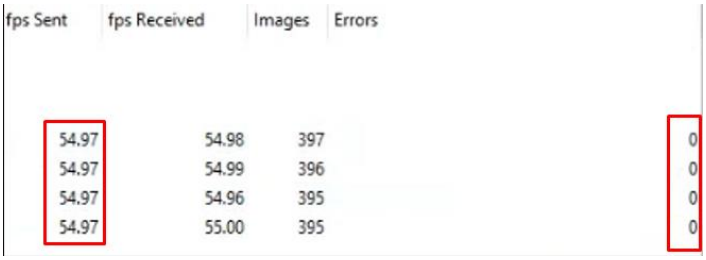
which is higher than 450 MB/s managed by the USB controller.

Divide 450 MB/s by (4+1) = 5 cameras (total 90 MB/s) and modify the bandwidth per each camera.



4. Click on Start Analysis

5. Check the value under the column **fps Sent** is higher than the values reported in Table 1 (for the number of cameras connected). Check that no errors are shown under the column **Errors**.



6. Click on Stop Analysis and then on Close to exit the Bandwidth Manager.

2.5.3. Digital USB 2.0 cameras and USB cables

RECORD-IT! MEDIA works with a wide variety of digital cameras (provided that the relevant driver is correctly installed), but we only ensure total compatibility with the digital USB 2.0 cameras manufactured by IDS and The Imaging Source (TIS). Panlab-Harvard Apparatus can only provide after-sales support on the RECORD-IT! MEDIA camera management if used with the models recommended in this User Manual.

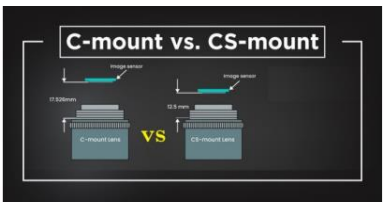
Depending on the configuration purchased we provide 3 USB cable length options with our cameras: 3, 5 or 8 m.

The digital cameras provide high-resolution images at frame rate of up to 40 fps. The quality of the images and the minimal installation requirements make the digital cameras ideal for video tracking.

2.5.3.1. Installing TIS Digital USB 2.0 Cameras

RECORD-IT! MEDIA can manage one TIS Digital USB 2.0 camera at a time. Once plugged in, the camera is recognized by Windows, but it will be necessary to install the drivers in order to manage it. To install a TIS digital camera in Windows® systems, please follow the next steps:

1. Unpack the camera and remove the CS/C lens adapter ring supplied with the camera before mounting the lens.



2. Plug the device to a free USB 2.0 or USB 3.0 port. Once plugged in, Windows recognized that there is a connected device, but it will be necessary to install the drivers in order to manage the camera.
3. Please make sure to have administrative privileges in the computer in which the device will be installed. Contact your IT staff to confirm this issue before continuing with this procedure.
4. Plug the installation key of RECORD-IT! MEDIA into a USB 2.0 port and launch the installation tool (PANLAB.EXE).

5. Select the "**Hardware Drivers**" option.

6. Enter the "**Digital Camera Drivers -> TIS USB 2.0 Digital Camera**" folder and execute the .exe file. Then follow all the steps with the default options.
7. Click the '**Finish'** button to finish the installation.
8. Wait for the Windows Device installation assistant to launch and follow the default steps until finishing.

2.5.3.2. Installing IDS Digital USB 2.0 Cameras (Legacy mode)

Using a USB Hub to expand a USB port to 4 ports, it will be possible to connect up to 4 Digital USB 2.0 cameras simultaneously using RECORD-IT! MEDIA. On the other hand, in order to connect more than 4 cameras, an expansion card (PCIe) will be necessary. For example, one PCIe connected to 4 USB Hub will allow to connect up to 16 Digital USB 2.0 cameras simultaneously using RECORD!-IT MEDIA. In this case, please follow the manufacturer instructions to install it. Please be aware that you will need to power the PCIe connecting it to a cable from the power unit within the PC, so it would be better to use a slot near the power unit. Ask your IT Department if you need further assistance.

Table 1, reports the maximum frame rate allowed for each camera model depending on the number of cameras:

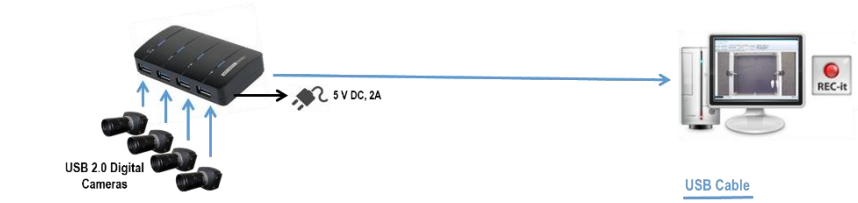
Table 2: USB 2.0 (IDS) cameras

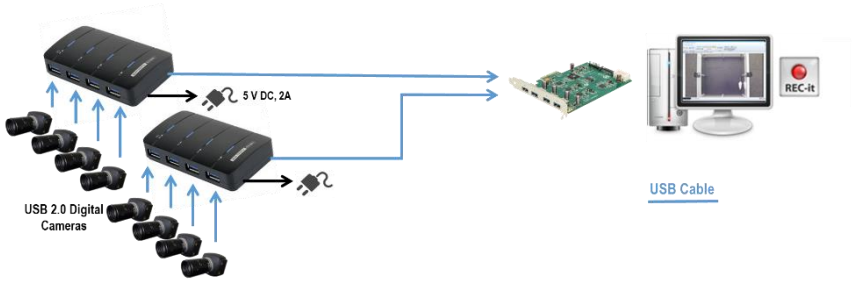
REFERENCE	SENSOR	RESOLUTION	FPS per number of cameras			
			1	2-4†	5-8*†	9-16*†
CAMDCCOLOR$	Color	640X480	25	25	25	15
CAMDCBW$	Monochrome	640X480	25	25	25	15
CAMDCNIR	NIR	640X480	25	16	10	-

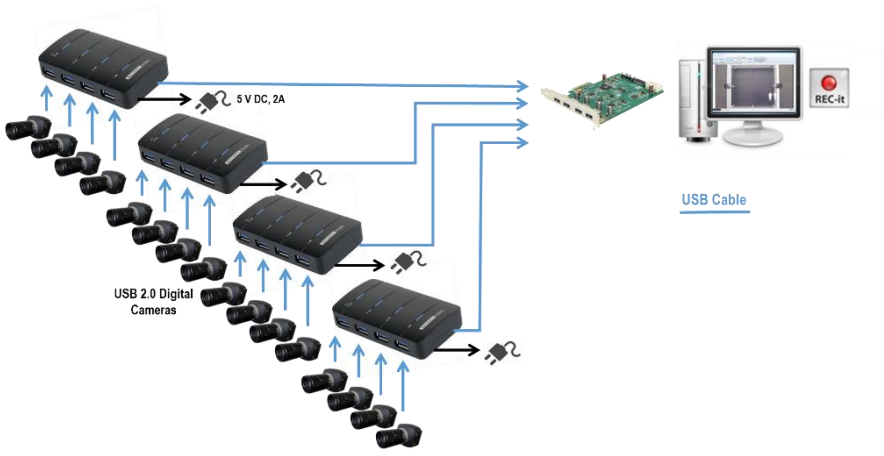
†Need 1 to 4 USB 3.0 Hub

*Need PCIe USB 3.0

$Legacy Model

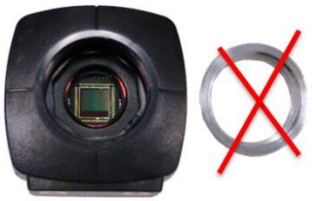






To install an IDS digital camera in Windows® systems, please follow the next steps:

1. Unpack the camera, remove the O-ring from the objective and mount the lens. If the O-ring is not removed, the image received from the camera may be blurry. This ring may be black or silver in color.



2. IMPORTANT: Do not plug the camera into any USB port before step 7 of this installation guide.
3. Please make sure to have administrative privileges for the computer where the device will be installed. Contact your IT staff to ensure you have administrative rights before continuing with this procedure.
4. Plug the installation key of RECORD-IT! MEDIA into a USB 2.0 port and launch the installation tool (PANLAB.EXE).
5. Select the **Hardware Drivers** option.

6. Enter the "**Digital Camera Drivers -> IDS Digital Camera**" folder and execute the correct .exe file (32 or 64 bit depending on the version of Windows). Then follow all the steps with the default options.
7. Click the **Finish** button to finish the installation. Restarting your computer is advised.
8. Plug the device to a free USB port.
9. Wait for the Windows Device installation assistant to launch and follow the default steps until finishing.
10. To use the device, go to the RECORD-IT! MEDIA **Image Source manager** (refer to chapter 4.2) and select the **USB Digital camera** image source (refer to chapter 4.2.2)**.**

Digital USB 2.0 cameras settings (ID, frame rate)

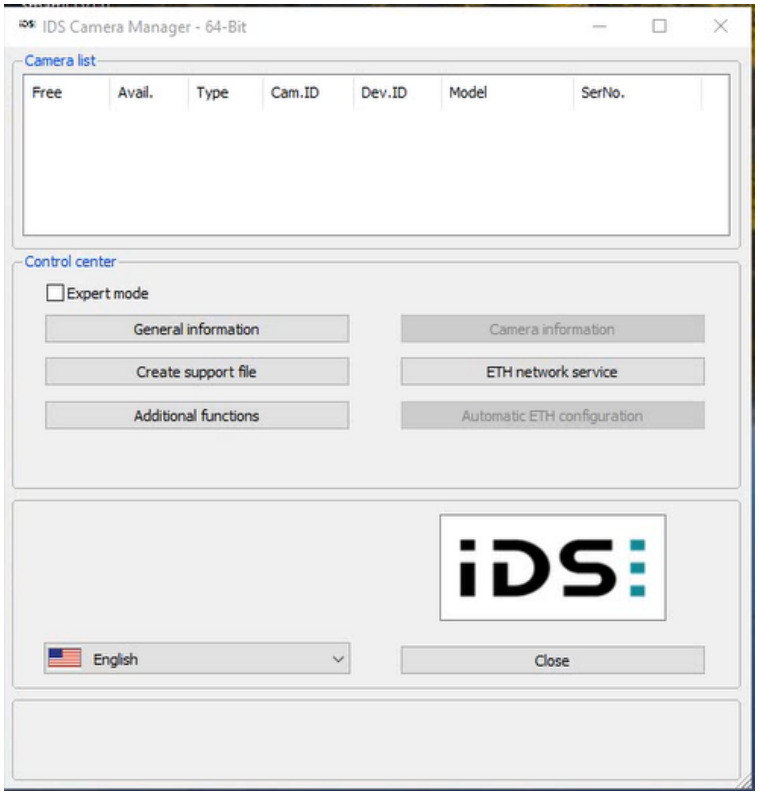
- When working with the IDS digital USB cameras, several parameters need to be set for optimal video recording process:

- Internal camera ID (especially if working with a multiple camera setup)
- Frame rate and frame size, this will depend on the available USB communication bandwidth.

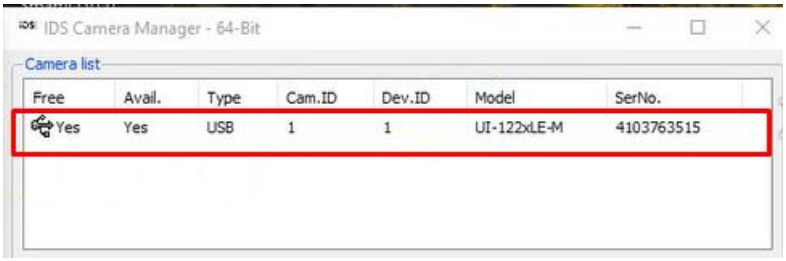
Set the internal ID of the IDS camera

Follow the next steps:

1. Open the “IDS Camera Manager” (the shortcut should be available from the desktop).



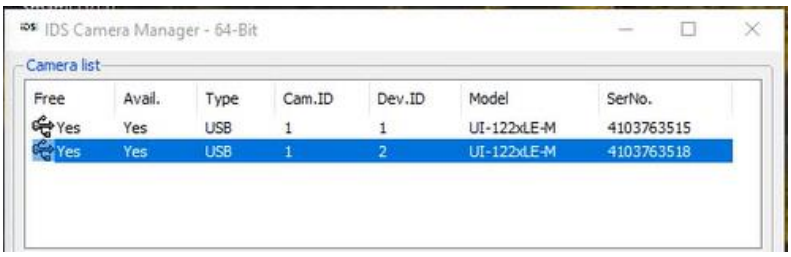
2. Connect the first camera. If a USB HUB is needed to connect multiple cameras to the computer, make sure that you connect the camera first to the USB Hub and then USB HUB to the computer. The camera will be automatically detected by the **IDS Camera Manage**r and displayed in the **Camera list**.



The **IDS Camera Manager** displays the camera Serial Number (**SerNo**.) as well as the Camera ID (**Cam.ID**) and Device ID (**Dev.ID**). The camera will be automatically assigned as ID 1.

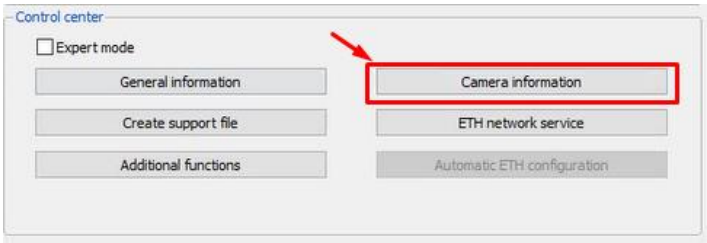
We recommend the user place an identification label on the camera to prevent confusion between the individual cameras used in the same setup.

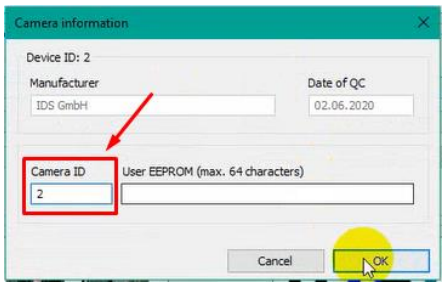
3. Connect the second camera. The camera will be automatically detected by the **IDS Camera Manager** and displayed in the **Camera list**.



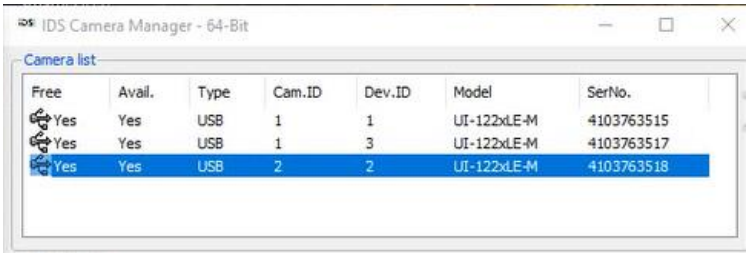
The IDS Camera Manager displays the camera Serial Number (**SerNo**.) as well as the Camera ID (**Cam.ID**) and Device ID (**Dev.ID**). The **IDS Camera Manager** always sets the Camera ID (**Cam.ID**) to 1. The **Cam.ID** should be changed to 2.

4. Click on the **Camera Information** button in the Control center section and change the **Camera ID** to 2, then click on the **OK** button.





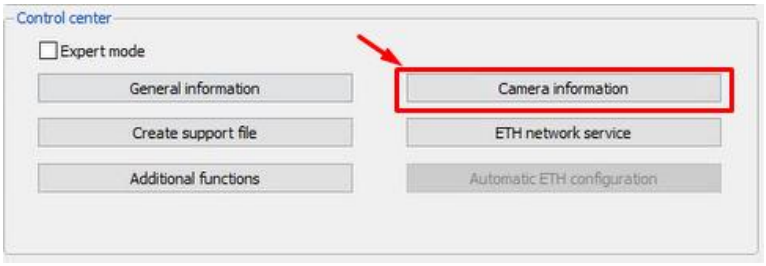
5. Connect the third camera.
   The camera will be automatically detected by the **IDS Camera Manager** and displayed in the **Camera list**.

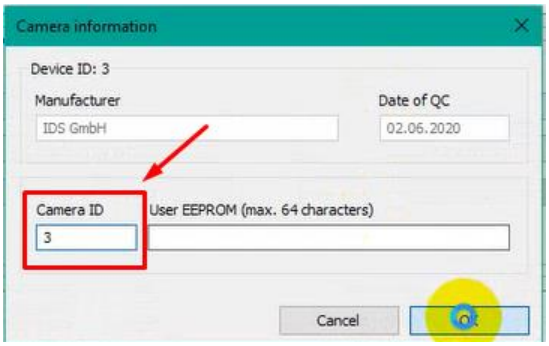


- The **IDS Camera Manager** displays the camera Serial Number (**SerNo**.) as well as the Camera ID (**Cam.ID**) and Device ID (**Dev.ID**).

- The **IDS Camera Manager** always sets the Camera ID (**Cam.ID**) to 1. The **Cam.ID** should be changed to 3.

6. Click on the **Camera Information** button in the Control center section and change the **Camera ID** to 3, then click on the **OK** button.

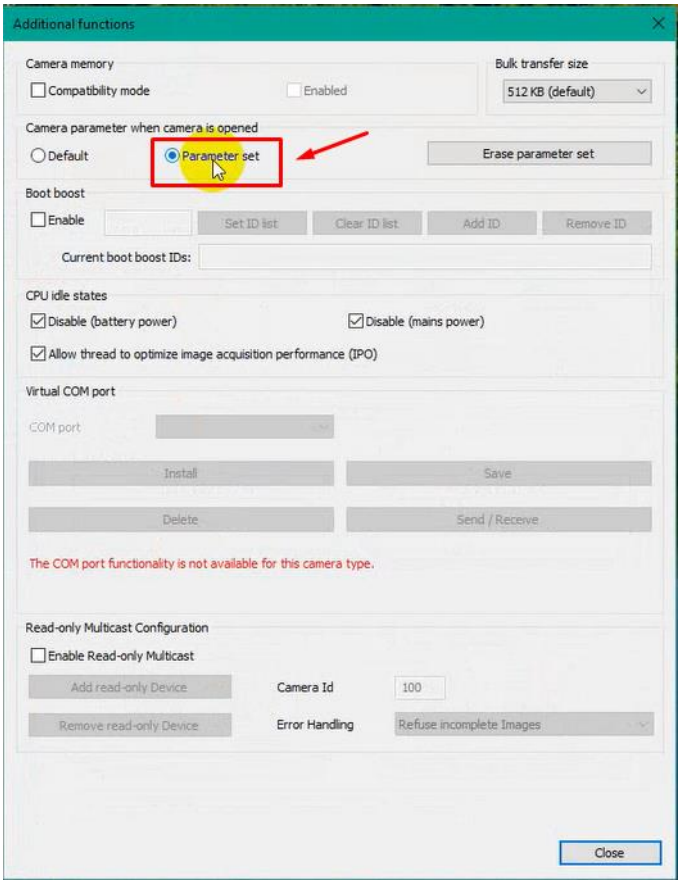




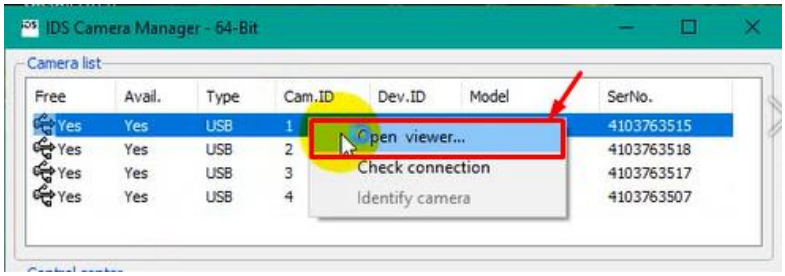
7. Connect the next camera and repeat the step until all the cameras have been connected and set with an appropriate ID.
8. Make sure that all the cameras have a different ID number.

2.5.3.3. Setting the optimal frame rate that will be used for the video recording

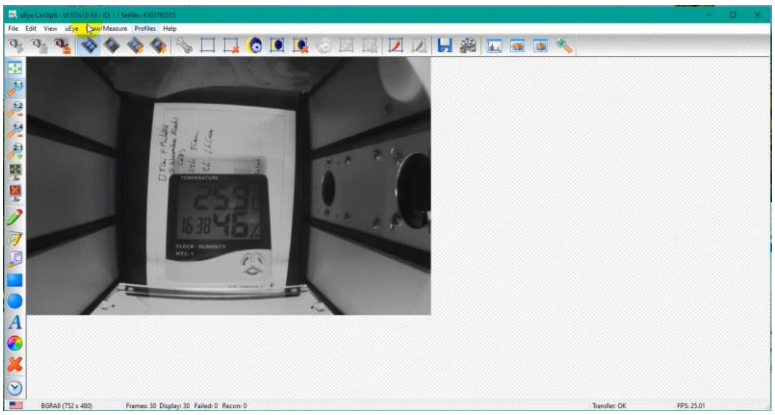
1. Click on the **Additional functions** button in the Control center section, choose the **Parameter Set** option and click on the **Close** button to Exit.



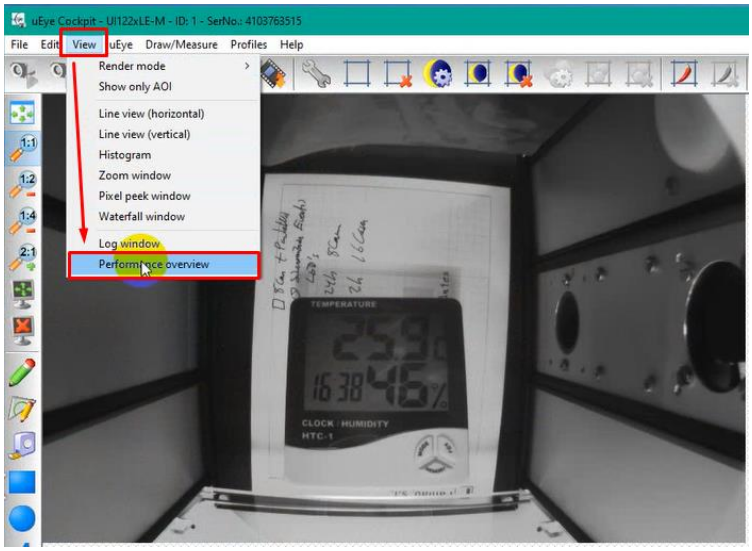
2. Select Camera 1 in the table, right-click and then choose the “Open viewer...” option in the list.

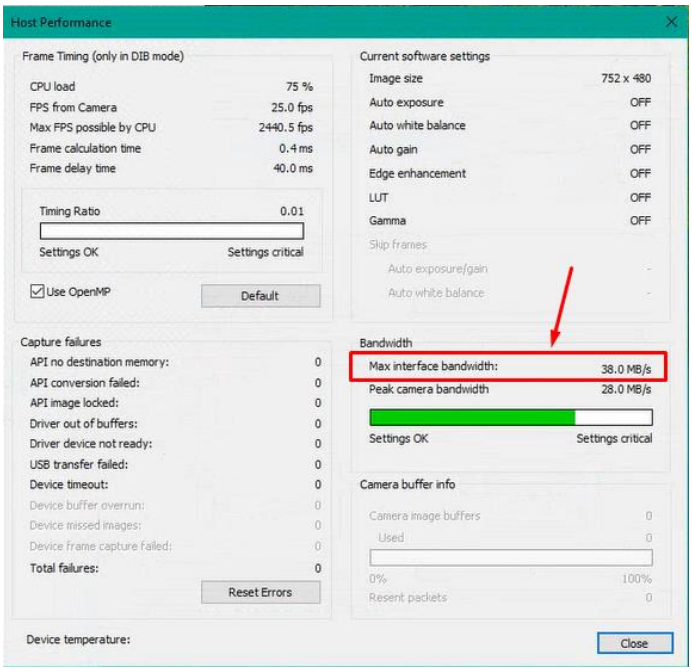


The IDS Camera Manager will provide the view of the images coming from the camera.



3. Click on the **View** main menu and select the **Performance overview** option and note the value of the **Max Interface bandwith**.

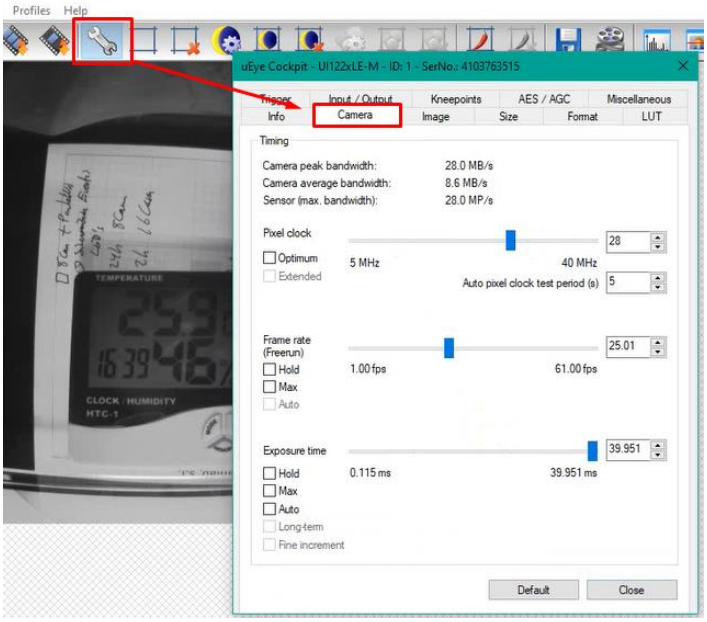




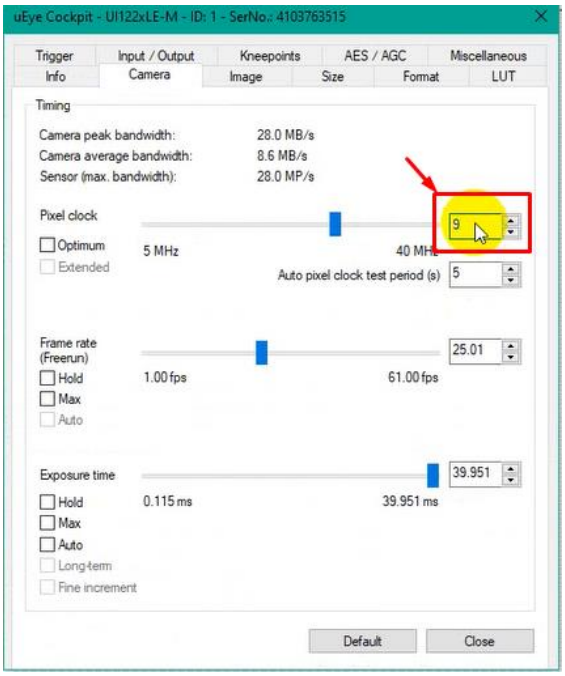
In this example the Max interface bandwidth value is 38.0 MB/s. This is the shared USB communication bandwidth available to all cameras connected to the same USB HUB or computer USB port.

If **4 cameras** are connected to this USB HUB/computer USB port, then the available bandwidth available for each camera would be 38.0/4 = 9.5. Round this value to the lower value: **9 MB/s**.

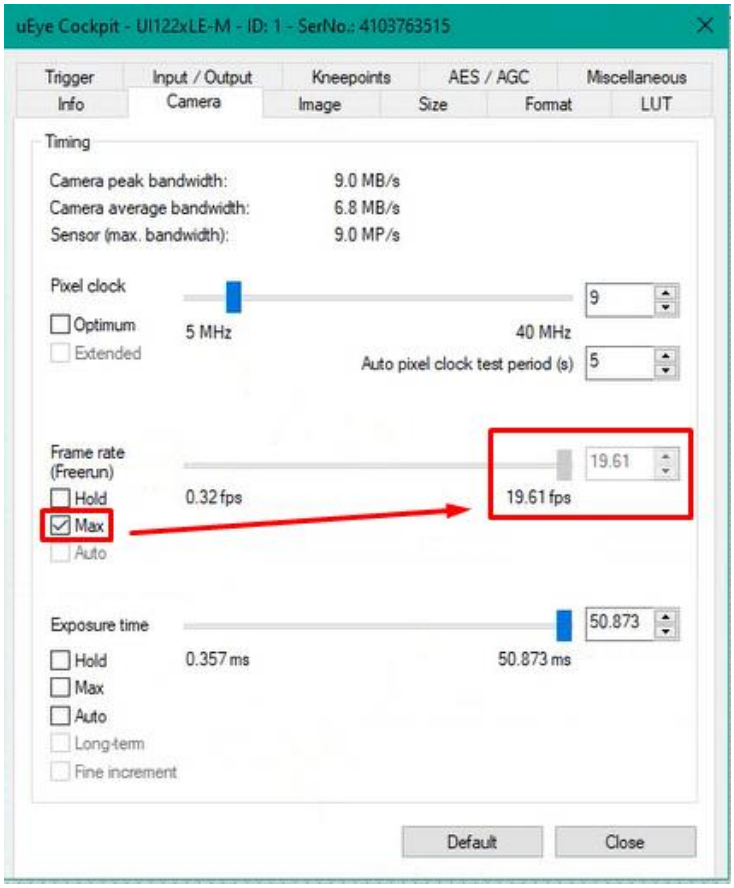
4. Click on the **Camera properties** button and display the **Camera** Tab.



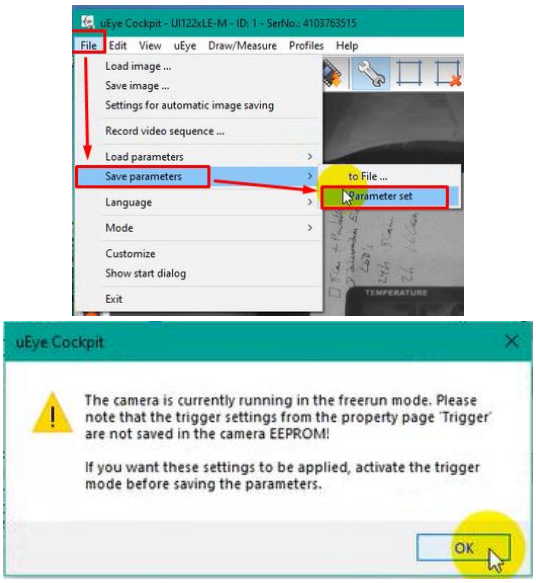
5. Set the **Pixel Clock** to the calculated value (9 in this example):



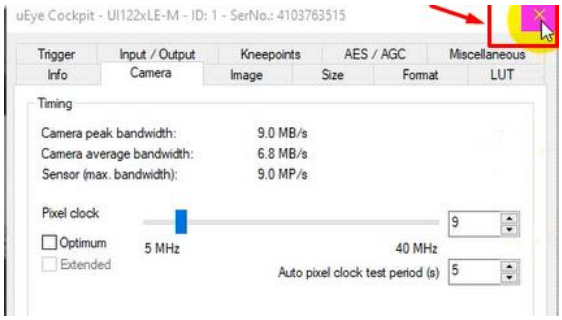
6. The values shown in the **Frame rate** section of the screen will update. Check the **Max** option to display the maximum frame rate that can be used for each cameras: here 19 fps.



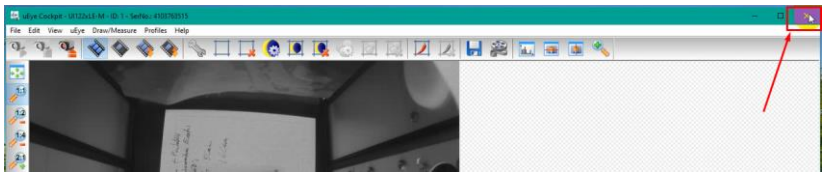
7. Save the **Parameter set** by selecting the **Save Parameters/Parameter set** option of the **File** main menu.



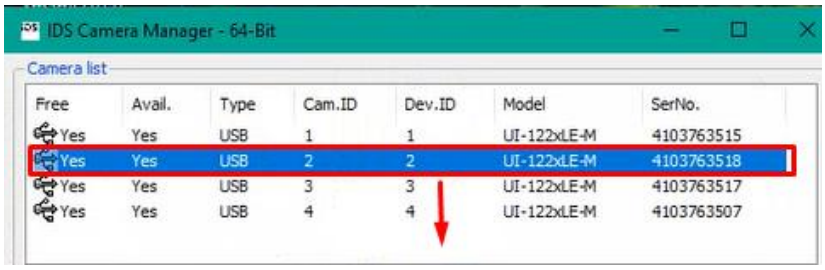
8. Close the uEye Cockpit panel of the Camera 1.



9. Close the Camera 1 Viewer

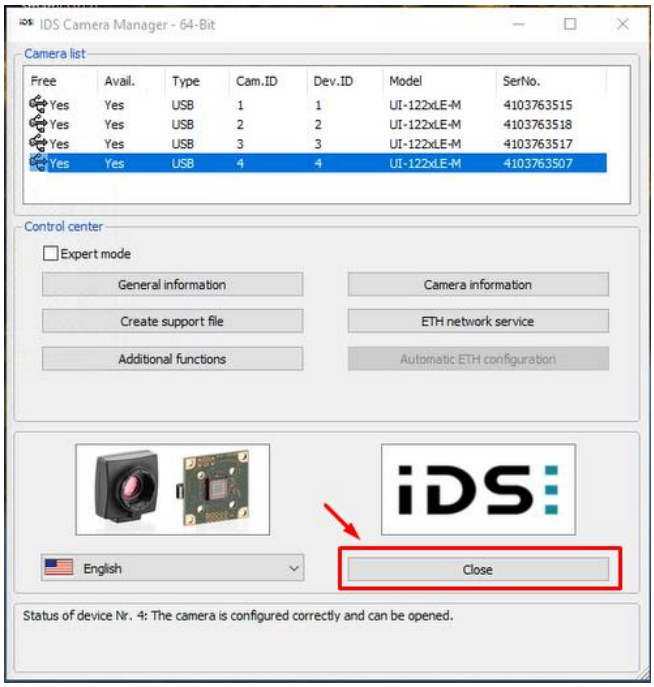


10. Repeat the same operation with all cameras:



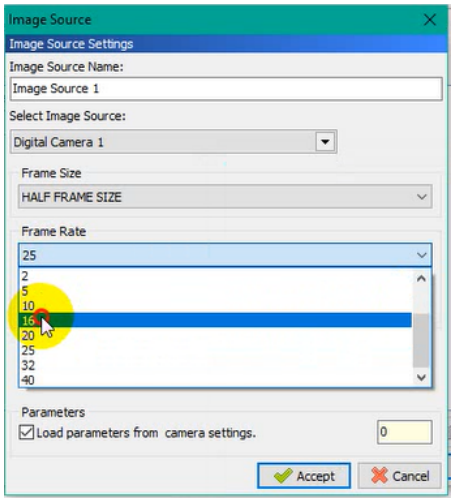
- Select Camera 2 in the table, right-click and then choose the **Open viewer...** option in the list.
- Click on the **Camera properties** button and display the **Camera** Tab.
- Set the **Pixel Clock** to the calculated value (9 in this example).
- The values shown in the **Frame rate** section of the screen will update. Check the **Max** option to display the maximum frame rate that can be used for each cameras: here 19 fps.
- Save the **Parameter set** by selecting the **Save Parameters/Parameter set** option of the **File** main menu.
- Close the uEye Cockpit panel of the Camera 2.
- Close the Camera2 Viewer.
- Select Camera 3 in the table, click right and then choose the **Open viewer...** option in the list.
- Etc.

11. Close the IDS Camera Manager when all cameras are set



2.5.3.4. Set the optimal frame rate in RECORD-IT! MEDIA when defining the cameras (see chapter 4.2.2)

Select a frame rate value equal to or lower than the calculated MAX Frame Rate (from Step 6 above). The max frame rate calculated was 19 fps in our example, so 16 fps is the closest available that is equal or **LOWER**.



The selected frame value **<u>should always be lower or equal</u>** to the calculated optimal value.

If the selected frame rate is **greater than** the calculated optimal value, some **problems** may occur with the recorded video (performance issues, incoherent video file duration, …).

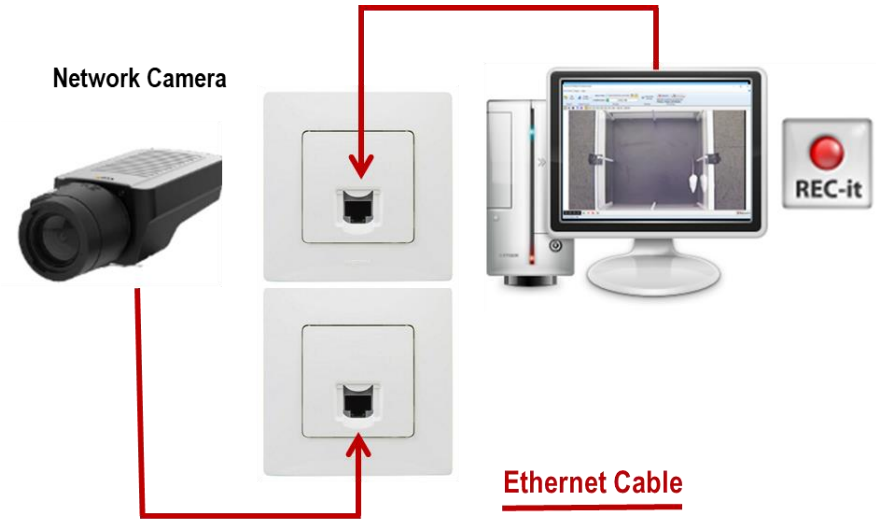
2.5.4. Network cameras

RECORD-IT! MEDIA is compatible with ONVIF and non-ONVIF Network cameras.

- For ONVIF cameras, RECORD-IT! MEDIA provides direct access to the camera settings.
- For non-ONVIF cameras, please follow the manufacturer's set-up instructions prior to using RECORD-IT! MEDIA. RECORD-IT! MEDIA will only provide access to the camera images (RTSP Streaming), but not to its settings.

Most IP cameras can stream video using a RTSP URL request. Contact the camera supplier/manufacturer to get the correct RTSP URL address for your camera model.

IP cameras are designed to be used on Ethernet networks. An IP address is needed to access the camera. Please, contact your IT to connect your IP camera(s) to your Ethernet network.



It is possible to connect up to 16 cameras simultaneously. However, be aware that you will need an Ethernet Switch POE to connect more than one camera at the same time. The main requirement for ONVIF cameras is to have Profile S protocol.

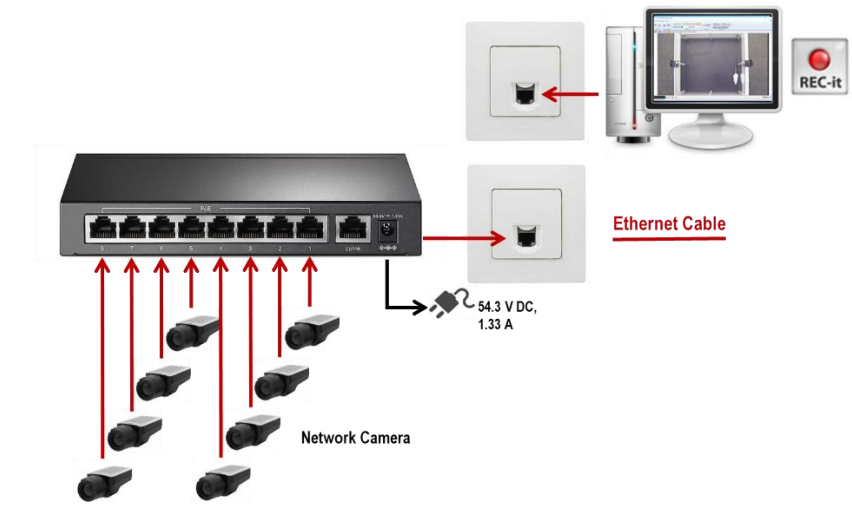
The main requirement for non-ONVIF cameras is to fulfill the RTSP protocol.

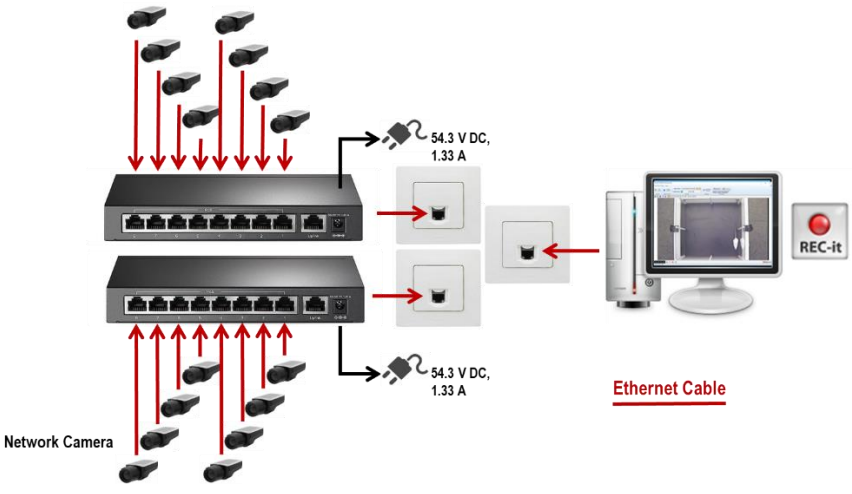
Table 3 reports the maximum frame rate allowed for each camera model, depending on the number of cameras simultaneously connected:

Table 3: Network ONVIF Profile S cameras

MODEL	SENSOR	PROTOCOL	RESOLUTION	FPS per number of cameras			
				1	2-4◊	5-8◊	9-16◊
Tested with Axis M1134 Network Camera	Color	ONVIF Profile S	1280X960	25	20	16	16

◊ Need 1 to 2 Ethernet Switch





Network considerations:

When working with IP Network cameras, the network infrastructure (LAN/WAN) and performance of your experimental facilities is an important point to be considered. If bandwidth bottlenecks occur, streaming video can show jitter, delay, or corruption. This could result in the video not getting recorded or showing aberrant duration.

2.5.5. Installing an analog-digital converter for analogic cameras

Our analog-digital video converter (CONVANAUSB) enables the use of analogic image technology by digitizing the incoming images of analogic sources.

The analog-digital video converter (CONVANAUSB) is an optional accessory that can be purchased with your RECORD-IT! MEDIA system. Please contact your dealer to find out the advantages of this accessory and how to acquire it.

Only one analog-digital video converter (CONVANAUSB) can be plugged into the computer. This option cannot be used for multiple camera needs.

Before using the device, the corresponding drivers must be installed.

Three different versions of the analog-digital video converter have been released, each one of them requiring different drivers.

Before continuing, please check which version you have in your system:

Version 1	Version 2	Version 3
		

2.5.5.1. Installing Version 1 of the Analog-Digital Converter

To install the device in Windows® systems, please follow the next steps:

1. IMPORTANT: Do not plug the device into any USB port before step no. 7 of this installation guide.
2. Please make sure to have administrative privileges for the computer where the device will be installed. Contact your IT staff to ensure you have administrative rights before continuing with this procedure.

3. Plug the installation key of RECORD-IT! MEDIA into a USB 2.0 port and launch the installation tool (PANLAB.EXE).
4. Select the **Hardware Drivers** option.

5. Enter the "**Analog Camera -> CONVANAUSB Drivers ->Version 1**" folder and execute the correct .exe file (32 or 64 bit depending on the version of Windows). Then follow all the steps with the default options.
6. Click the **Finish** button to finish the installation. Restarting your computer is advised.
7. Plug the device into a free USB 2.0 port. Make sure to remove the yellow label from the USB end of the cable first.
8. Wait for the Windows Device installation assistant to launch and follow the default steps until finishing.
9. To use the device, go to the RECORD-IT! MEDIA Image Source manager (refer to chapter 4.2) and select the Analog-Digital Converter image source (refer to chapter 4.2.5).

2.5.5.2. Installing Version 2 or Version 3 of the Analog-Digital Converter

To install the device in Windows® systems, please follow the next steps:

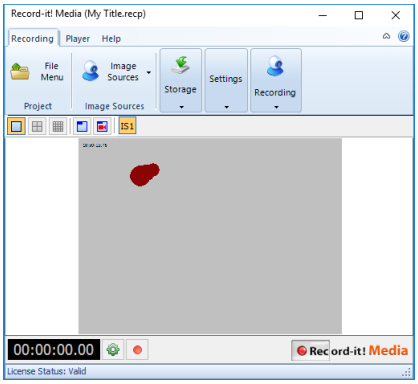
1. IMPORTANT: Do not plug the device into any USB port before step no. 7 of this installation guide.
2. Please make sure to have administrative privileges for the computer where the device will be installed. Contact your IT staff to ensure you have administrative rights before continuing with this procedure.
3. Plug the installation key of RECORD-IT! MEDIA into a USB 2.0 port and launch the installation tool (PANLAB.EXE).
4. Select the **Hardware Drivers** option.

5. Enter the "**Analog Camera -> CONVANAUSB Drivers ->Version 2 to 4**" folder and execute the .exe file. Then follow all the steps with the default options.
6. Click the **Finish** button to finish the installation. Restarting your computer is advised.
7. Plug the device into a free USB 2.0 port. Make sure to remove the yellow label from the USB end of the cable first.
8. Wait for the Windows Device installation assistant to launch and follow the default steps until finishing.
9. To use the device, go to the RECORD-IT! MEDIA **Image Source manager** (refer to chapter 4.2) and select the **Analog-Digital Converter** image source (refer to chapter 4.2.5)**.**

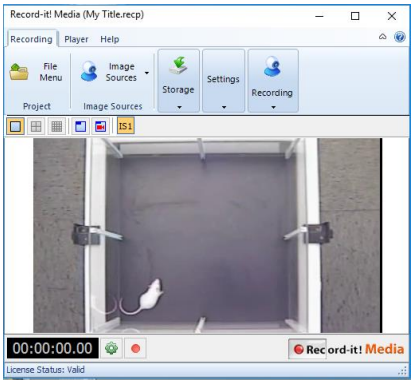
2.5.6. Simulated live image source

Three additional simulated live image sources can be used in RECORD-IT! MEDIA for demo purposes. A simulated live image is a "live image" that is not fed by an on-line camera but is digitally built on an already recorded video file played in a closed loop.

- **Camera Simulator - Computer generated:** RECORD-IT! MEDIA provides the live image of a moving red dot on a grey background.



- **Camera Simulator - Recorded Subject**: RECORD-IT! MEDIA provides the live image of a moving white mouse on a black background.



- **Camera Simulator - Custom Recorded video**: RECORD-IT! MEDIA provides a tool for selecting a user video file.

Recommended frame rate for maximum performance on 8 simulated cameras: 5 fps.

2.6. Codecs and supported video files

Digital video files can store large image sequences into relatively small files. To do that, digital recorders use the compression and codification methods that reduce the final size of the file.

Compression and codification processes are carried out by a special software component called CODEC (CO-mpressor/DEC-ompressor) that should be installed both on the recorder and in the reader devices.

Each CODEC can deal with a variety of digital video formats, according to vendor specifications. For this reason, RECORD-IT! MEDIA can manage digital video files in a variety of formats, provided the corresponding CODEC is already installed.

The CODECS used by RECORD-IT! MEDIA are the **H.264/MPEG-4 AVC codec** (Xvid equivalent), providing file with the ***.mkv** extension.

When installing the RECORD-IT! MEDIA software, the H.264/MPEG-4 AVC (Xvid) will be **automatically installed**.

Please note that Microsoft Windows® operating system includes CODECs for several standard video formats such as MPEG-4 or Indeo®. RECORD-IT! MEDIA installation software also includes additional CODECs to process the video recorded using the H.264/MP4AVC codec and other formats such as VOB files.

Installing additional CODECs will allow RECORD-IT! MEDIA to open any digital video format, for example DIVX or SVCD.

Most CODECs discard some of the original data to reduce the file size. Although a CODEC tries to remove only portions of the data that humans are not likely to note, if the compression level of a video file is too high, portions of the removed data will be easily notable, and accuracy will be lost. Therefore, when using CODECs to compress your video, there is a trade-off between quality and file size.

PANLAB suggests the H.264/MPEG-4 AVC (Xvid) implementation provided within the software or, if possible, acquiring the commercial edition of the CODEC used.

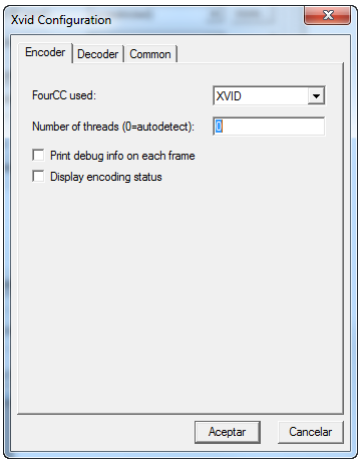
2.6.1. Installing the H.264/MPEG-4 AVC codec manually

This CODEC is installed automatically on the computer when the RECORD-IT! MEDIA software is installed.

In case a manual installation should be required, please follow these steps:

1. Plug the installation key of **Record-It! Media** into a USB 2.0 port and launch the installation tool (PANLAB.EXE).
2. Select the **Video Codecs** option.

3. Execute the **Xvid Codec.exe** file. Then follow all the steps with the default options.
4. Click the **Finish** button to finish the installation.
5. Execute the **Configure Encoder** tool located at the Start > All programs > Xvid folder.
6. Click on the **Other options…** button located at the bottom of the **Xvid Configuration** window.
7. Uncheck the option **Display encoding status** and click on the **OK** button.



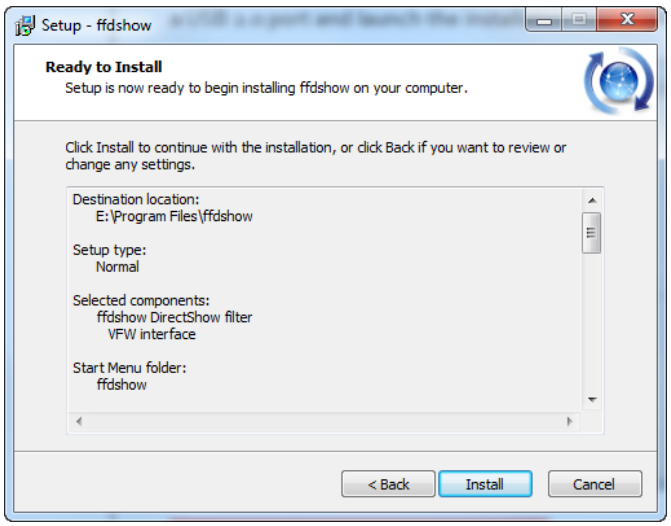
8. Then click on the OK button in the Xvid Configuration window.

2.6.2. Installing codecs to process external MPEG-4 videos

To open the MPEG-4 video files, an MPEG-4 video decoder must be installed on the computer where **Record-It Media!** is being utilized.

1. Plug the installation key of RECORD-IT! MEDIA into a USB 2.0 port and launch the installation tool (PANLAB.EXE).
2. Select the Digital Video Codecs option.

3. Execute the **Ffdshow Codec.exe** file. Then follow all steps by selecting the default options until the installation is finished.



2.7. Supported and unsupported video file formats

RECORD-IT! MEDIA supports all common digital video formats. It contains proprietary decoding systems that can decode most of the existing video formats.

However, in some special cases, it is possible that the digital video file cannot be opened by RECORD-IT! MEDIA. Also, it is possible that it does not playback correctly or that it requires a special codec to be installed on the system.

Table 4 shows a subset of the most common formats supported by RECORD-IT! MEDIA:

Table 4: File extensions supported by RECORD-IT! MEDIA

Video format	Usual file extension
Audio Video Interleave	*.avi
Windows Media Video	*.wmv, *.asf
QuickTime	*.mov, *.qt
Moving Picture Experts Group	*.mpg, *.mpeg, *.mp4, *.m4v,
Matroska Multimedia Container	*.mkv

The above-mentioned formats contain video streams that may be compressed with different codecs. RECORD-IT! MEDIA supports the codecs specified in the following list. Additional codecs are supported if the corresponding codec is installed in the system.

8088flex TMV	LCL (LossLess Codec Library) MSZH
Amazing Studio PAF Video	LOCO
AMV Video	LucasArts SANM/Smush
ANSI/ASCII art	lossless MJPEG
Apple Intermediate Codec	Microsoft ATC Screen
Apple MJPEG-B	Microsoft Expression Encoder Screen
Apple ProRes	Microsoft RLE

Apple QuickDraw	Microsoft Screen 1
Asus v1	Microsoft Screen 2
Asus v2	Microsoft Video 1
ATI VCR1	Mimic
ATI VCR2	Miro VideoXL
Auravision Aura	MJPEG (Motion JPEG)
Auravision Aura 2	Mobotix MxPEG video
Autodesk Animator Flic video	Motion Pixels video
Autodesk RLE	MPEG-1 video
Avid 1:1 10-bit RGB Packer	MPEG-2 video
AVS (Audio Video Standard) video	MPEG-4 part 2
AYUV	MPEG-4 part 2 Microsoft variant version 1
Beam Software VB	MPEG-4 part 2 Microsoft variant version 2
Bink Video	MPEG-4 part 2 Microsoft variant version 3
Bitmap Brothers JV video	Nintendo Gamecube THP video
y41p Brooktree uncompressed 4:1:1 12-bit	NuppelVideo/RTjpeg
CamStudio	On2 VP3
CD+G	On2 VP5
CDXL	On2 VP6
Chinese AVS video	On2 VP7
Discworld II BMV Video	VP8

Canopus Lossless Codec	VP9
Cinepak	Pinnacle TARGA CineWave YUV16
Cirrus Logic AccuPak	Prores
CPiA Video Format	Q-team QPEG
Creative YUV (CYUV)	QuickTime 8BPS video
Deluxe Paint Animation	QuickTime Animation (RLE) video
DNxHD	QuickTime Graphics (SMC)
Duck TrueMotion 1.0	QuickTime video (RPZA)
Duck TrueMotion 2.0	R10K AJA Kona 10-bit RGB Codec
DV (Digital Video)	R210 Quicktime Uncompressed RGB 10-bit
Dxtory capture format	Raw Video
Electronic Arts CMV video	RealVideo 1.0
Electronic Arts Madcow video	RealVideo 2.0
Electronic Arts TGV video	RealVideo 4.0
Electronic Arts TGQ video	Renderware TXD (TeXture Dictionary)
Electronic Arts TQI video	SGI RLE 8-bit
Escape 124	Sierra VMD video
Escape 130	Silicon Graphics Motion Video Compressor 1 (MVC1)
FFmpeg video codec #1	Silicon Graphics Motion Video Compressor 2 (MVC2)
Flash Screen Video v1	Smacker video
Flash Screen Video v2	SMPTE VC-1

Flash Video (FLV)	Sony PlayStation MDEC (Motion DECoder)
Forward Uncompressed	Sorenson Vector Quantizer 1
Fraps	Sorenson Vector Quantizer 3
Go2Webinar	Sunplus JPEG (SP5X)
H.261	TechSmith Screen Capture Codec
H.263 / H.263-1996	TechSmith Screen Capture Codec 2
H.263+ / H.263-1998 / H.263 version 2	Theora
H.264 / AVC / MPEG-4 AVC / MPEG-4 part 10	Ut Video
HEVC	v210 QuickTime uncompressed 4:2:2 10-bit
HNM version 4	v308 QuickTime uncompressed 4:4:4
HuffYUV	v408 QuickTime uncompressed 4:4:4:4
HuffYUV FFmpeg variant	v410 QuickTime uncompressed 4:4:4 10-bit
IBM Ultimotion	VBLE Lossless Codec
id Cinematic video	VMware Screen Codec / VMware Video
id RoQ video	Westwood Studios VQA (Vector Quantized Animation)
IFF ILBM	Windows Media Image
IFF ByteRun1	Windows Media Video 7
Intel H.263	Windows Media Video 8
Intel Indeo 2	Wing Commander III / Xan
Intel Indeo 3	Wing Commander IV / Xan

Intel Indeo 4	Winnov WNV1
Intel Indeo 5	WMV7
Interplay MVE video	YAMAHA SMAF
J2K	Psygnosis YOP Video
Karl Morton's video codec	YUV4
Lagarith	ZeroCodec Lossless Video

RECORD-IT! MEDIA does not support videos with DRM (Digital Rights Management) protection.

Incompatibilities with **K-Lite Codec Pack** has also been detected and they may affect the acquisition process in ".avi" digital video files. It is strongly recommended to avoid installing this codec pack.

2.8. Video-tracking considerations

Files recorded through the RECORD-IT! MEDIA software may be uploaded to an external video-tracking system, such as SMART, for collection of various behavioral data. Video-tracking requires specific environmental conditions and video settings, dependent on the application. These factors should be considered prior to use of the RECORD-IT! MEDIA software to ensure that parameters are appropriate for the experimental goals and per the recommendations of the video-tracking manufacturer.

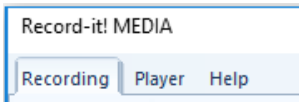
Please consult the user's manual of the video-tracking system for specific recommendations for the following points:

- Camera frame rate settings (no more than 16 fps)
- Camera/lens resolution, angle of vision, and manual/automated adjustments
- Camera model: color / B&W / Infra-red
- Camera positioning /support
- Lighting conditions
- Video Duration
- Maze & enclosure size, material, and color
- Etc.

3. STARTING WITH RECORD-IT! MEDIA

The RECORD-IT! MEDIA Software can be launched manually through the desktop icon.

3.1. Main Menu



The main screen of RECORD-IT! MEDIA offers 3 tabs:

- **Recording**: section of the software used for video recording and saving.
- **Player**: section of the software used for visualizing video files.
- **Help**: section providing information about the application version, serial number, and contact data.

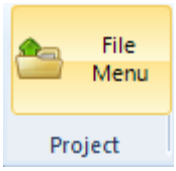
4. RECORDING

The Recording section of RECORD-IT! MEDIA provides 5 sub-sections:

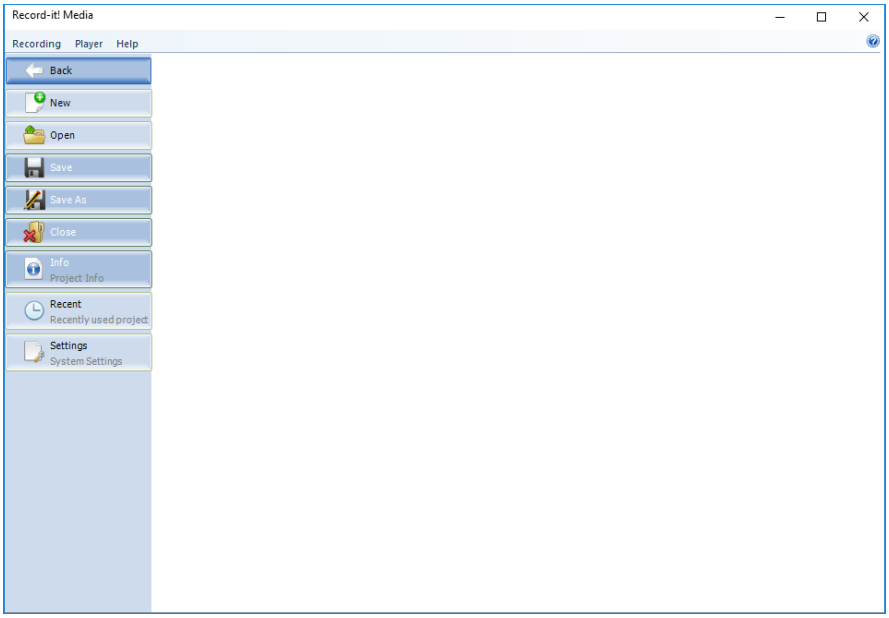
- Project
- Image Sources
- Storage
- Settings
- Recording

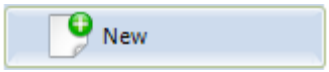
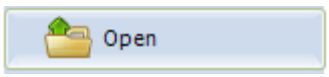
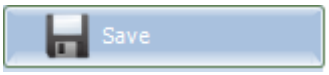
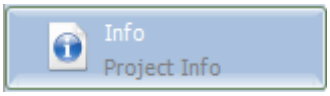
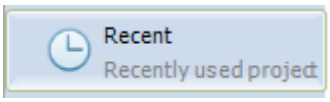
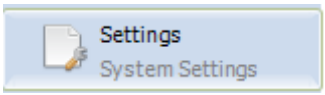
4.1. Project management

All the settings used for recording from one or more cameras are saved in a Record-it! Media project file.



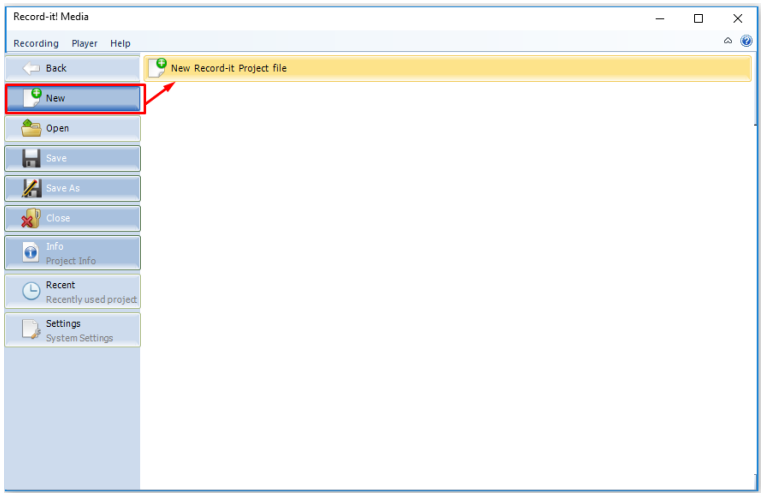
The Record-it! Media project files are managed through the File Menu.



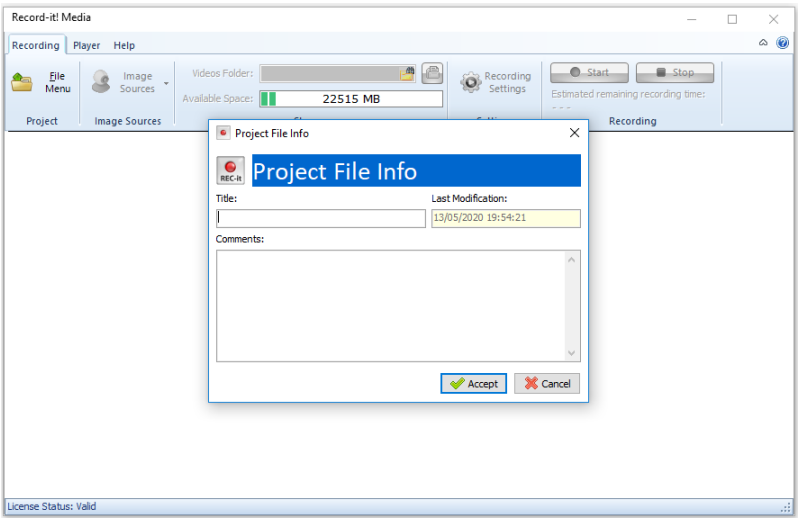
	Back to the recording main panel
	Create a new recording project file
	Open a recording project file
	Save the current recording project file
	Save the current recording project file with another name
	Add project file info
	Close the project file
	Show the list of the recently used recording projects
	Define the path to save the recording project files and the recorded videos

4.1.1. Create a new Record-it Project File

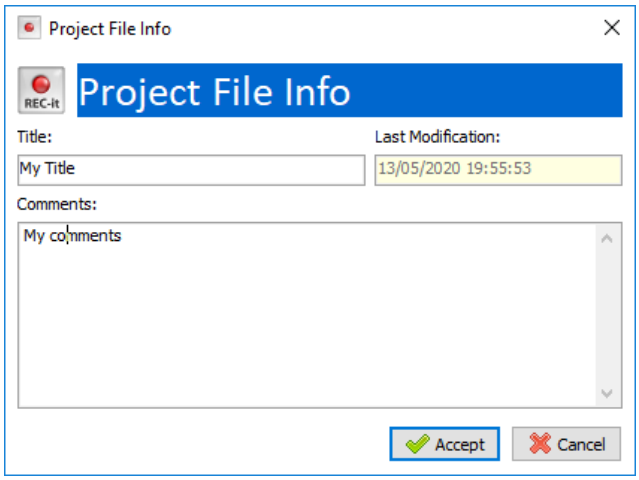
Click on the **New** button in the menu and then select the **New Record-it Project file** option.



Fill the **Project File Info** with the information of your preference.

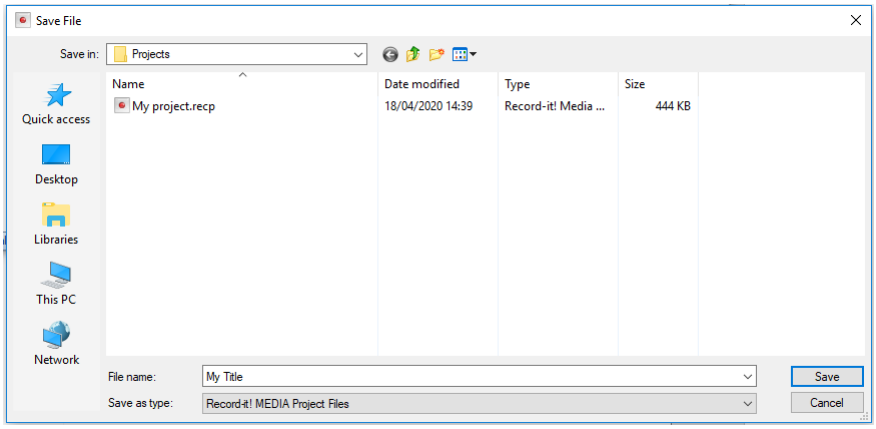


The **Project File Info panel** provides 2 freely editable sections: **Title** and **Comments**.

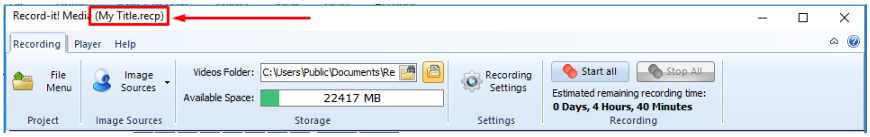


In this panel, RECORD-IT! MEDIA also shows the date/time of the **Last Modification** saved in the project file.

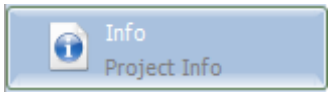
Click on the **Accept** button when done, then indicate the name and location where the file would be saved. By default, the path setting proposed is C:\Users\Public\Documents\Record-it! Video Recording\Projects\.



Then click on the Save button to save the project file. The name of the file will then be displayed on the top bar of the application.

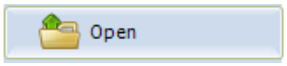


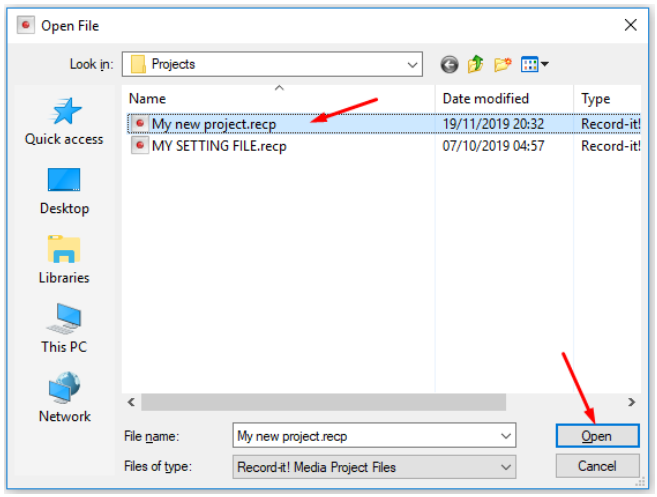
The project info can be changed and saved at any time through the **Info – Project Info** menu of the Main File Menu.



4.1.2. Open a RECORD-IT! MEDIA Project File

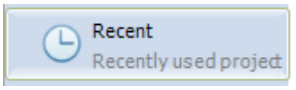
To open an already existing Record-IT! Project file, click on the Open button, select the file of interest from the **Open File** window and then click on the **Open** button.

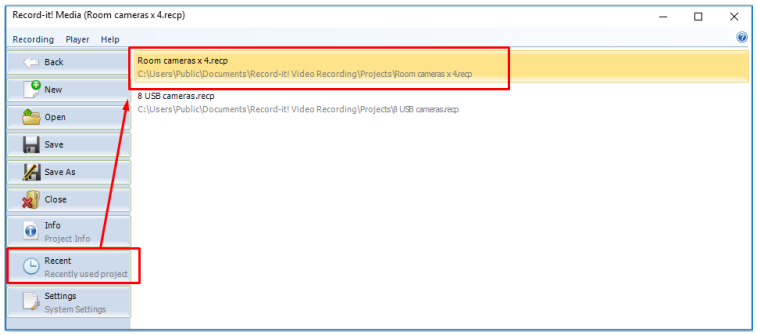




RECORD-IT! MEDIA will then load the camera and recording settings into the main panel.

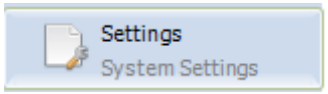
The user can also open a RECORD-IT! MEDIA Project file from the list of recent files displayed when selecting the Recent – Recently used project menu.

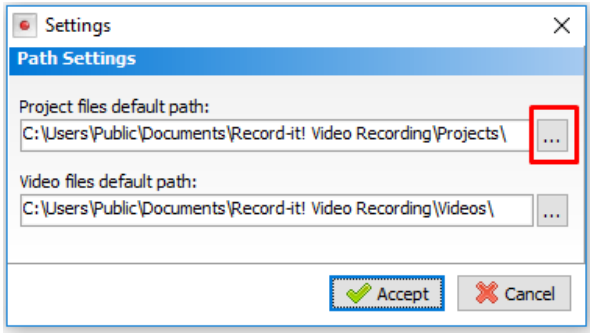


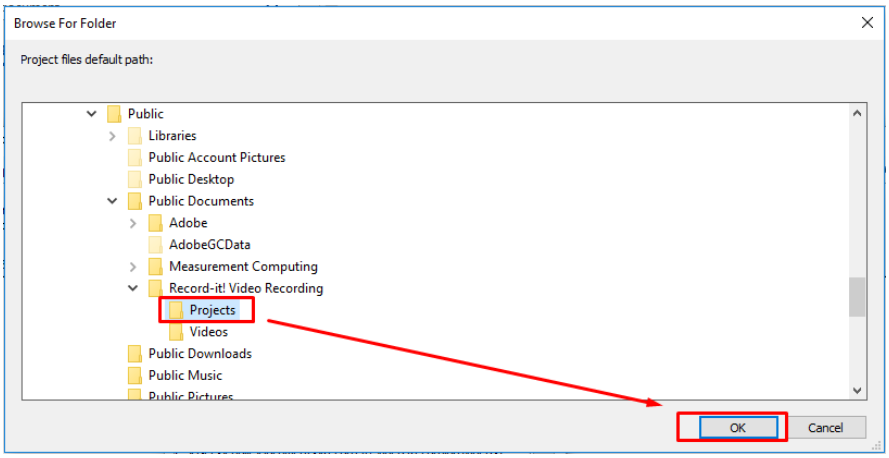


4.1.3. Change the project and video files path settings

To change the path settings for the RECORD-IT! MEDIA Project files and recorded videos, select the Settings – System Settings menu and choose another location for saving these files.

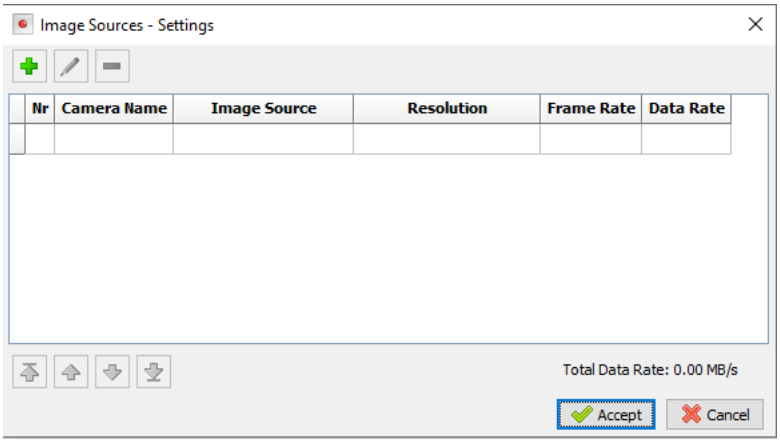




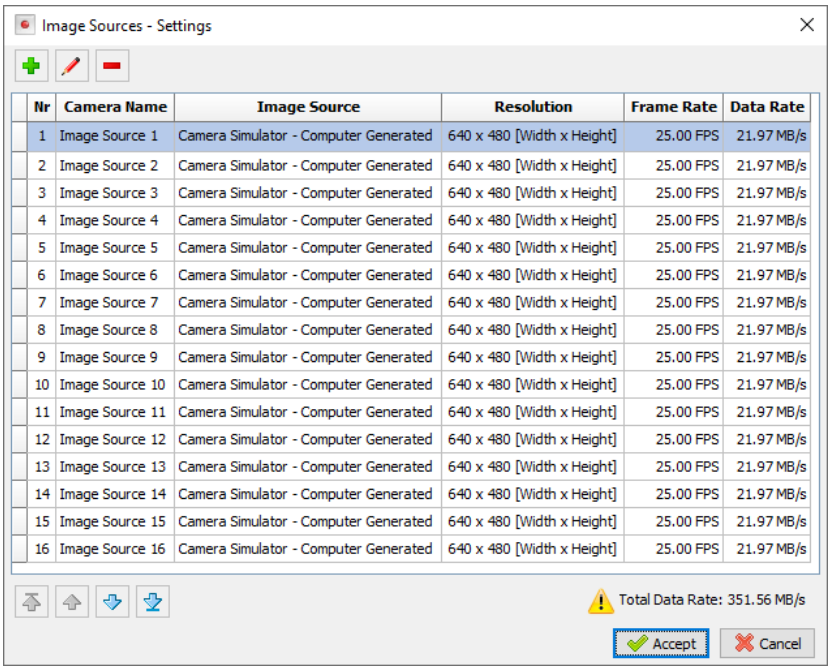


4.2. Image Sources

Click on the **Image Sources** main button to access the image source configuration table.



From the **Image Source - Setting** table, up to 16 cameras can be added. After adding one or several image sources, the following panel will resume the information about each of them:



The **Data Rate** column indicates the amount of data required by each camera. In the bottom right angle, the line Total Data Rate reports the sum of the data rates of all the image sources. It has been validated a correct functioning of the system when the Total Data Rate is below 120 MB/s. In case its value is higher, a warning sign is shown:

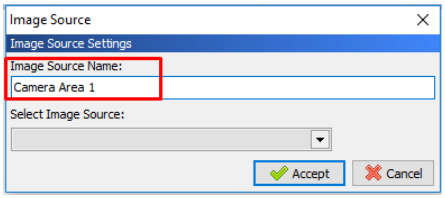
1. Click on **Accept** to open simultaneously all the image sources.
2. Start a recording (see chapter 4.6).
3. Open the Task Manager and check that the CPU usage is below 50%. If it is higher, consider reducing the number of FPS, the frame size or the number of image sources simultaneously working.

The following action buttons are available from the menu.

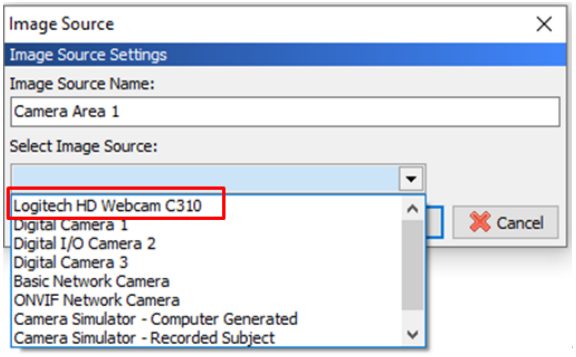
	Add a camera to the image source table
	Remove a camera from the image source table (an image source must be selected in the table before clicking on this button).
	Edit configuration of the selected image source (an image source must be selected in the table before clicking on this button).
	Move the selected camera to the top position (first position in the list)
	Move the selected camera to the last position in the list
	Move the selected camera one position up
	Move the selected camera one position down

4.2.1. Add a webcam image source

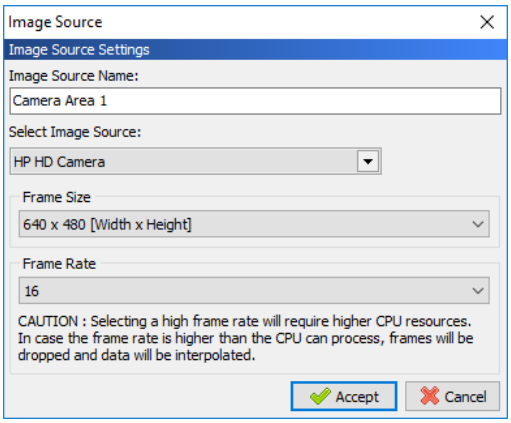
- Click on the  button to open the Image Source Setting panel.
- Edit the name of the camera in the **Image Source Name** text box (if needed)



- Select the webcam from the list of image sources displayed in the **Select Image Source** dropdown menu.



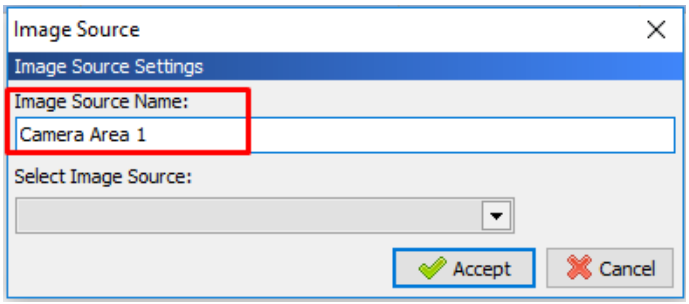
- Edit the available webcam parameters (here Frame Size and Frame Rate), if needed. Then click on the **Accept** button to exit.



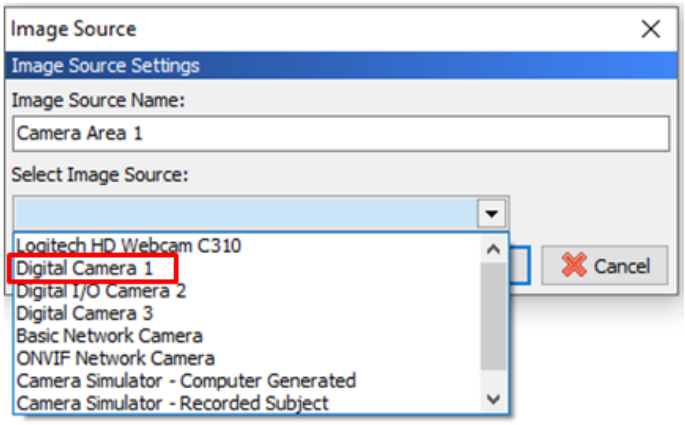
- The camera information is then displayed in the **Image Sources - Settings** table.

4.2.2. Add a USB digital camera image source

- Click on the  button to open the **Image Source** Setting panel.
- Edit the name of the camera in the **Image Source Name** text box (if needed).

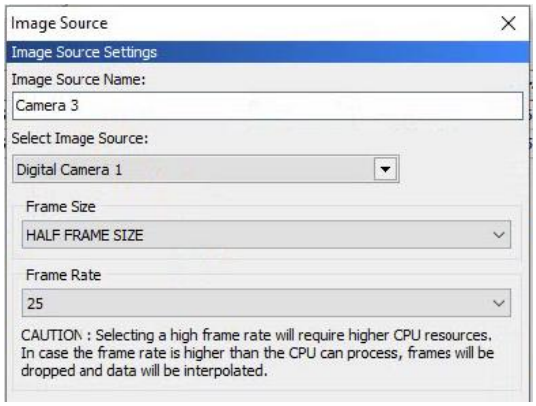


- Select the **Digital Camera** image source from the list of image sources displayed in the **Select Image Source** dropdown menu.



Note: For the Basler USB 3.0 digital camera, the name of the camera has a different structure. For example: "GigE Vision pu280-544(40308285)"

- Edit the available parameters (here Frame Size, Frame Rate, and other Parameters), if needed.



It is important to set a frame rate optimal for the video recording process based on present system performance. You **MUST** follow the steps described in chapter 2.5.3.2 to **set the camera ID** and calculate the **optimal frame rate** for each camera connected to the system. Refer to Tables 1 and 2 to adjust the optimal frame rate based on the number of cameras selected.

If the selected frame rate is greater than the calculated optimal value, problems may occur with the recorded video (performance issues, incoherent video file duration…).

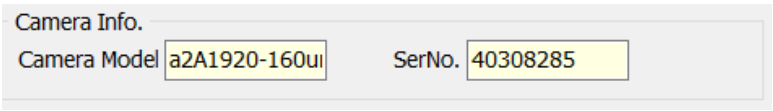
Please be advised that not all image sources provide the possibility to specify different frame sizes. In that case the panel will not show the frame size section.

In many image source devices choosing a bigger image size will result in a lower frame rate. Even if a higher frame rate is selected, the frame rate is always limited by the performance of the image source and the computer system in which it is running. This may cause the tracking and/or video recording to be performed with a lower frame rate than the one configured.

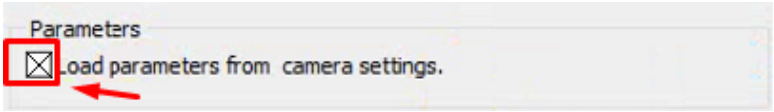
TIS Digital Cameras have the binning disabled. Thus, changing the resolution from 1280x960 to 640x480 will not reduce the frame size but will just reduce the region of interest.

- In case of a Digital USB 3.0 camera set with Pylon Viewer (Basler, see chapter 2.5.2.2) be sure to select the User Set defined in Pylon Viewer.

Also, in the bottom part of the panel, the info about the camera will be shown:



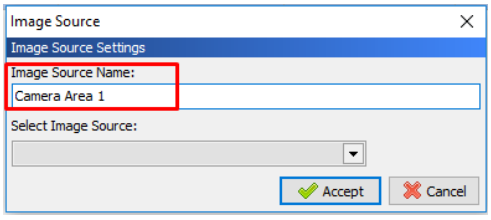
- In case of a Digital USB 2.0 camera set with IDS Camera Manager (see chapter 2.5.3.2) in the **Parameters** section, make sure that the **Load parameters from camera settings** option is checked.



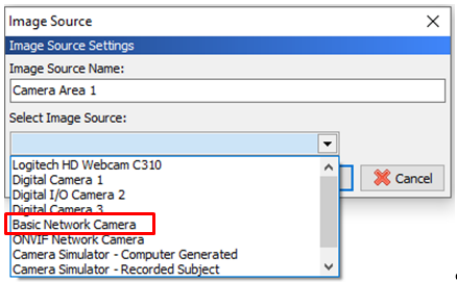
- Then click on the **Accept** button to exit.
- The camera information is then displayed on the **Image Source** table.

4.2.3. Add a Basic Network Camera image source (non-ONVIF)

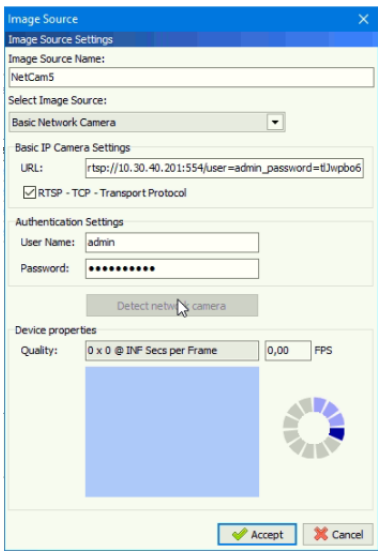
- Click on the  button to open the **Image Source** Setting panel.
- Edit the name of the camera in the **Image Source Name** text box (if needed).



- Select the **Basic Network Camera** option from the list of image sources displayed in the **Select Image Source** dropdown menu.



- Enter the **URL.**
  - Different types of cameras have different URL formats, so you will need to find the RTSP URL that is correct for your camera stream. Contact the camera supplier/manufacturer to get the correct RTSP URL address for your camera model.
  - Uncheck the "**RTSP – TCP – Transport Protocol**" option if the IP Camera does not allow RTSP-TCP-Transport.
  - Enter **User Name/Password** (if present) of the IP camera.



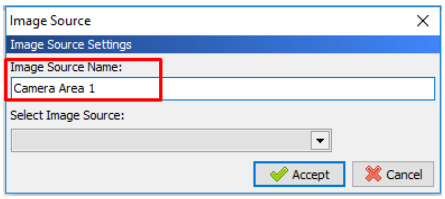
Click on the **Detect network camera** button to detect it.

Once detected, the **Quality** text box of the **Device properties** will be filled, and the image of the camera should be displayed in the preview panel.

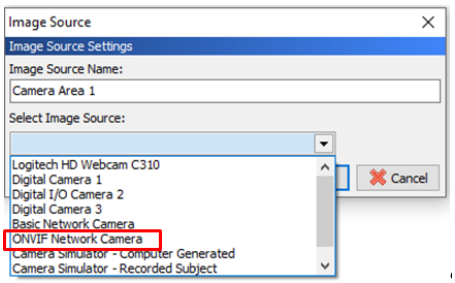
- The camera information is then displayed on the Image Source table.

4.2.4. Add an ONVIF Network Camera image source

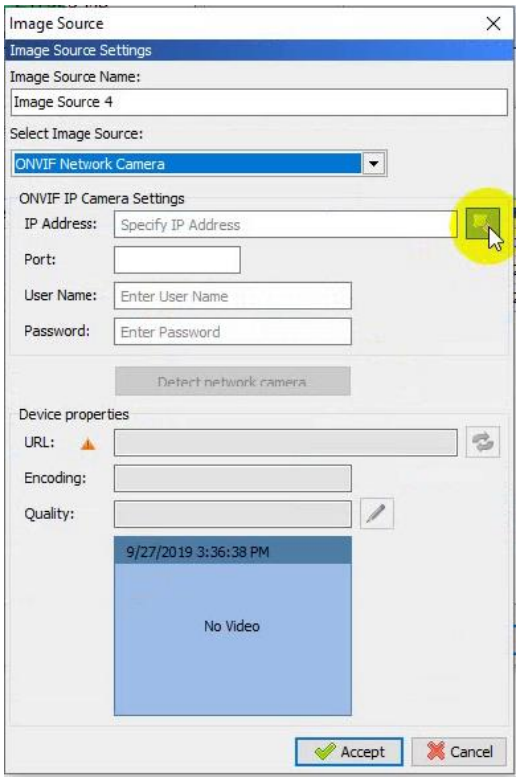
- Click on the  button to open the **Image Source** Setting panel.
- Edit the name of the camera in the **Image Source Name** text box (if needed).

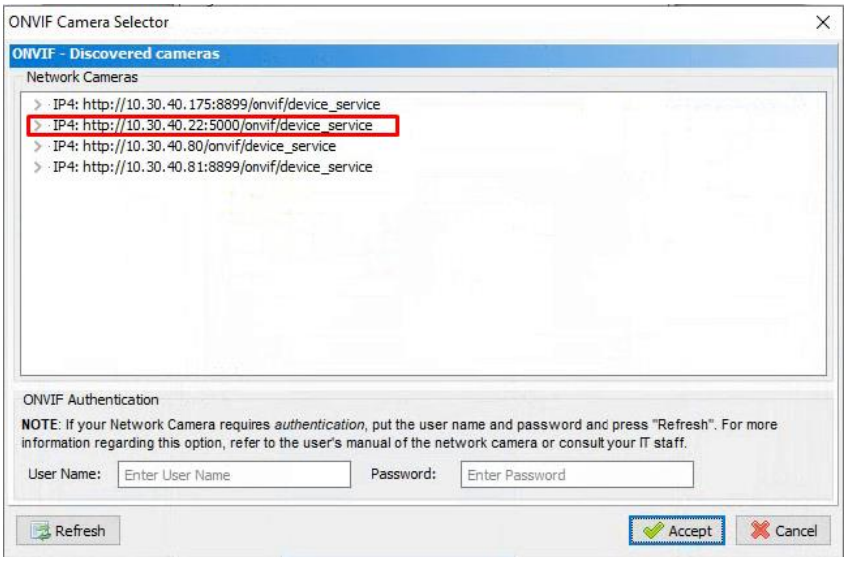


- Select the **ONVIF Network Camera** option from the list of image sources displayed in the **Select Image Source** dropdown menu.

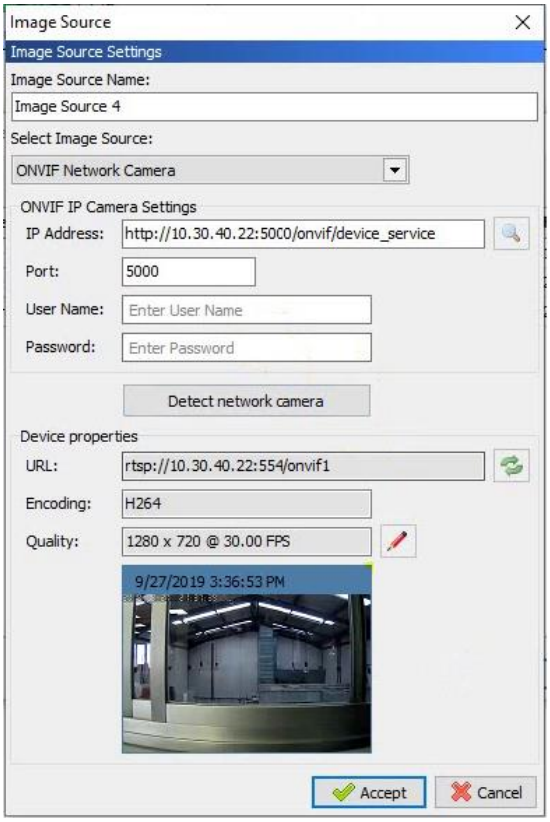


- Click on the **Search** button of the **IP address** to have access to the available list of installed ONVIF cameras, select one of the cameras and then click on the **Accept** button.





The corresponding **IP Address** and **Port** in the **Select Image Source** section as well as the devices properties will be filled with the corresponding information.

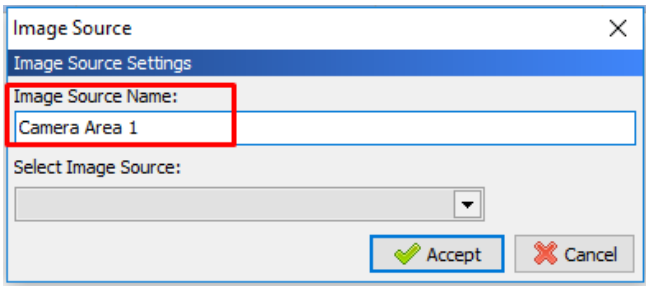


Click on the Edit Quality button  to select a different quality setting and then refresh the device properties by clicking on the **Refresh** button  . Refer to Table 3 to adjust the optimal frame rate based on the number of cameras selected.

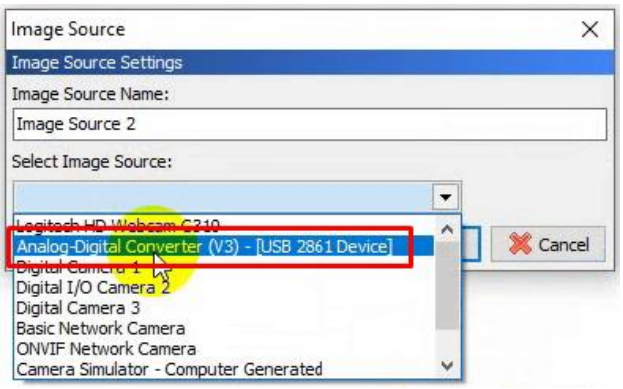
- Click on the **Accept** button to close the **Image Source Settings** panel.
- The camera information is then displayed on the Image Source table.

4.2.5. Add an analogic camera image source

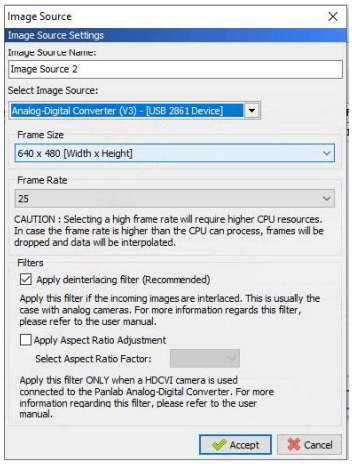
- Click on the  button to open the Image Source Setting panel.
- Edit the name of the camera in the **Image Source Name** text box (if needed).



- Select the corresponding **Analog-Digital Converter** option from the list of image sources displayed in the **Select Image Source** dropdown menu.



- Edit the available parameters (here Frame size, Frame Rate and Filters), if needed. Then click on the **Accept** button to exit.



Deinterlacing filter

The images provided by most analogic cameras are interlaced. Interlaced video is a technique to double the perceived frame rate of a video display without consuming extra bandwidth. The interlaced signal contains two fields of a video

frame captured at two different times. Although this enhances motion perception to the viewer, this technique produces images which are not optimal for video tracking, especially in case the subject is moving fast horizontally across the image. This means that interlaced images may greatly affect the outcome in global activity analysis.

The following is an example of a normal image compared to an interlaced image:

Normal image

Interlaced Image

Activating the deinterlacing filter, the interlaced images come back to normal images.

Aspect Ratio filter

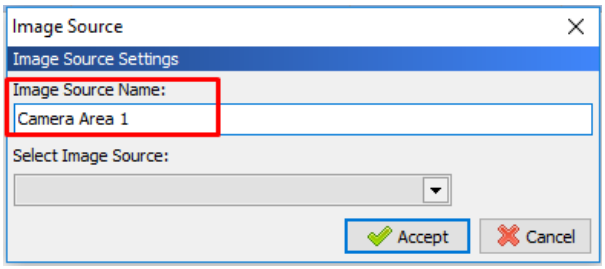
The Aspect Ratio Adjustment should be applied only when the CONVANAUSB is used to connect a HDCVI camera. With a HDCVI camera there is light distortion of the image, which stretches the image vertically. Review the document "User's Quick Guide_HDCVI Cameras" provided with the camera for additional information about this setting.

These filters require the installation of FFDSHOW codec. The FFDSHOW installer is automatically launched when RECORD-IT! MEDIA is installed, and no action is required by the user.

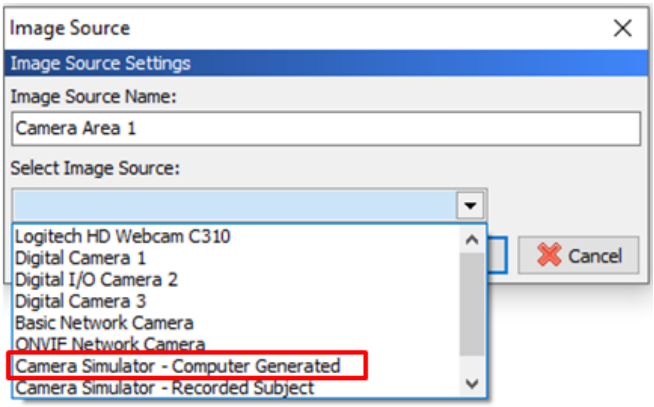
- The camera information is then displayed on the **Image Source** table.

4.2.6. Add a Camera Simulator – Computer Generated image source

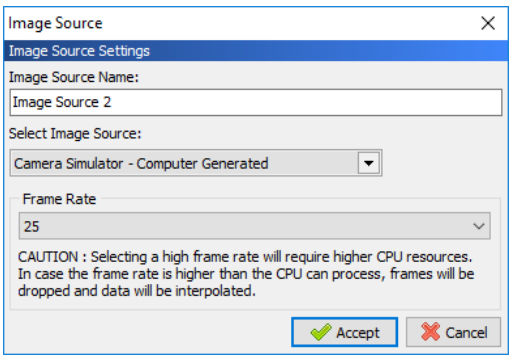
- Click on the  button to open the **Image Source** Setting panel.
- Edit the name of the camera in the **Image Source Name** text box (if needed).



- Select the **Camera Simulator – Computer Generated** option from the list of image sources displayed in the **Select Image Source** dropdown menu.



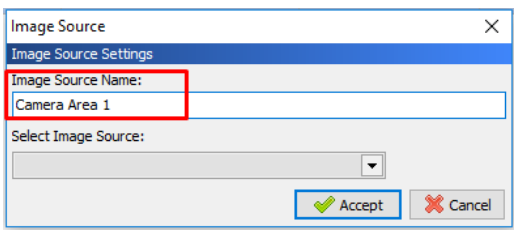
- Edit the available image source parameters (here Frame Rate), if needed. Then click on the **Accept** button to exit.



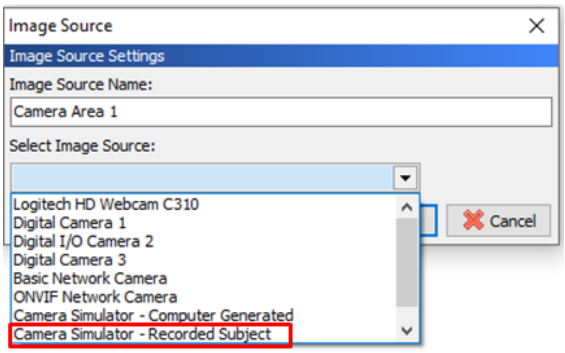
- The camera information is then displayed on the Image Source table.

4.2.7. Add a Camera Simulator – Recorded Subject image source

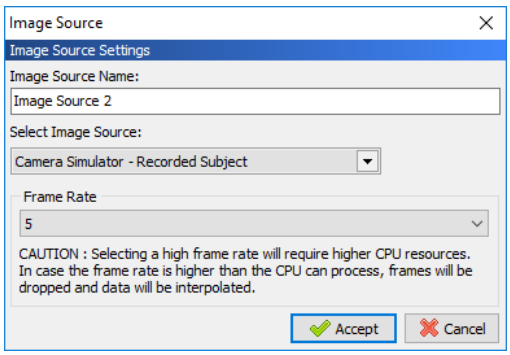
- Click on the  button to open the Image Source Setting panel.
- Edit the name of the camera in the **Image Source Name** text box (if needed).



- Select the **Camera Simulator – Recorded Subject** from the list of image sources displayed in the **Select Image Source** dropdown menu.



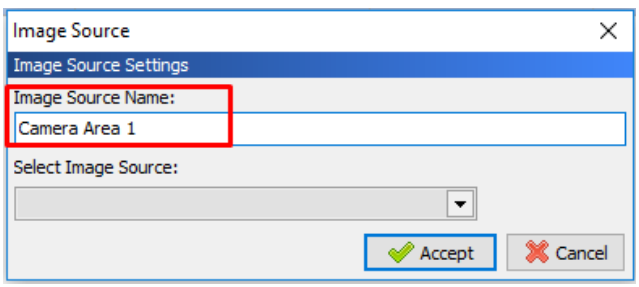
  - Edit the available image source parameters (here Frame Rate), if needed. Then click on the **Accept** button to exit.



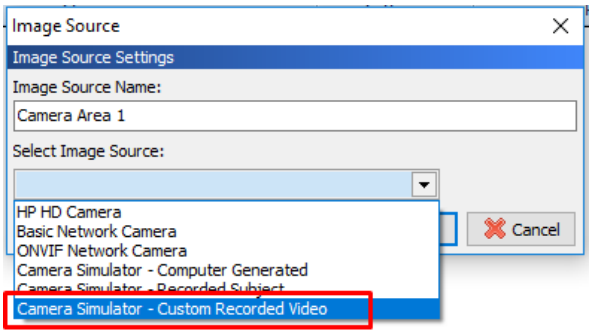
- The camera information is then displayed in the **Image Source** table

4.2.8. Add a Camera Simulator – Custom Recorded Video image source

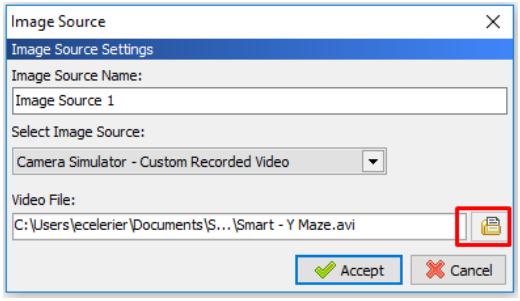
- Click on the  button to open the **Image Source** Setting panel.
- Edit the name of the camera in the **Image Source Name** text box (if needed).

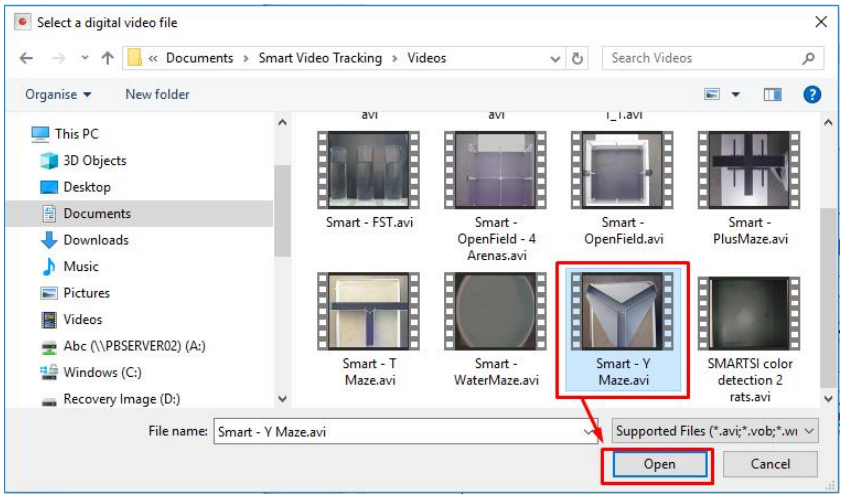


- Select the **Camera Simulator – Custom Recorded Video** from the list of image sources displayed in the **Select Image Source** dropdown menu.



- Select the **Video File** to be used as image source, **Open** it and then click on the **Accept** button.

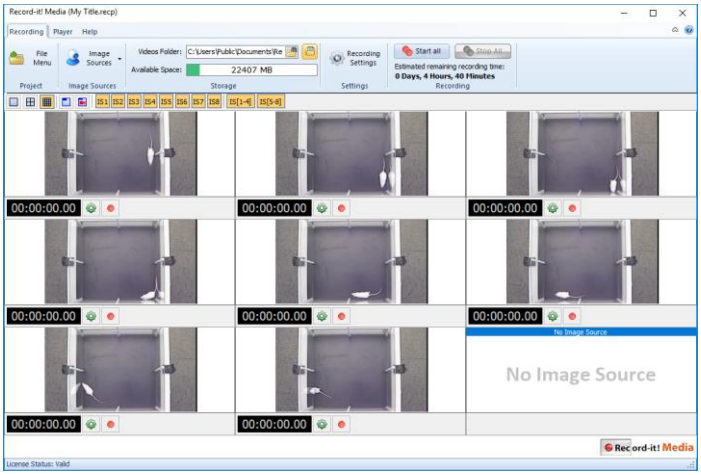




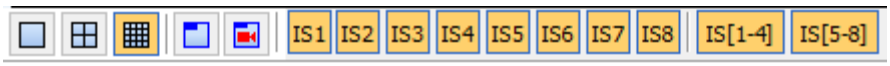
- The camera information is then displayed on the **Image Source** table.

4.3. Image Source display

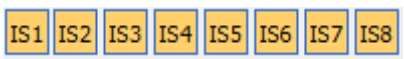
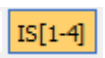
Once the Image Source – Settings panel is closed, the live view of all the cameras are displayed in the **Recording** main panel.



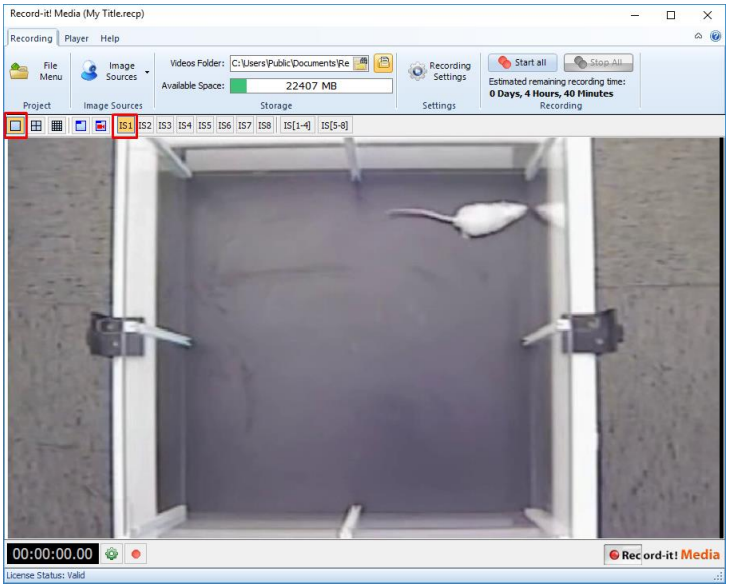
4.3.1. Image source view action bar



The camera view action bar allows the user to choose the way the images of the image source will be displayed in the **Recording** main panel.

	Single image source view
	Four image sources view
	All image sources view
	Show/Hide image source name
	Show/Hide image source status panel
	Camera selector for the single image source view
	Camera selector for viewing the image source 1 to 4
	Camera selector for viewing the image source 5 to 8

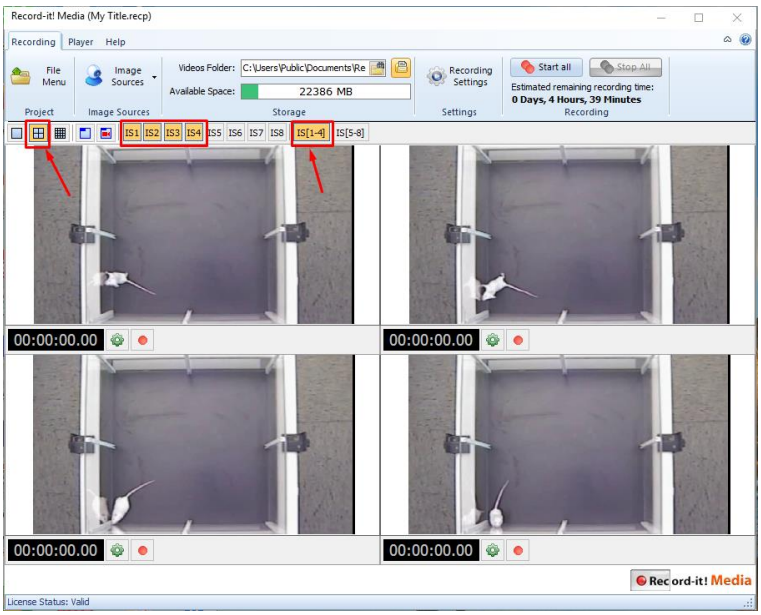
4.3.2. Single image source view

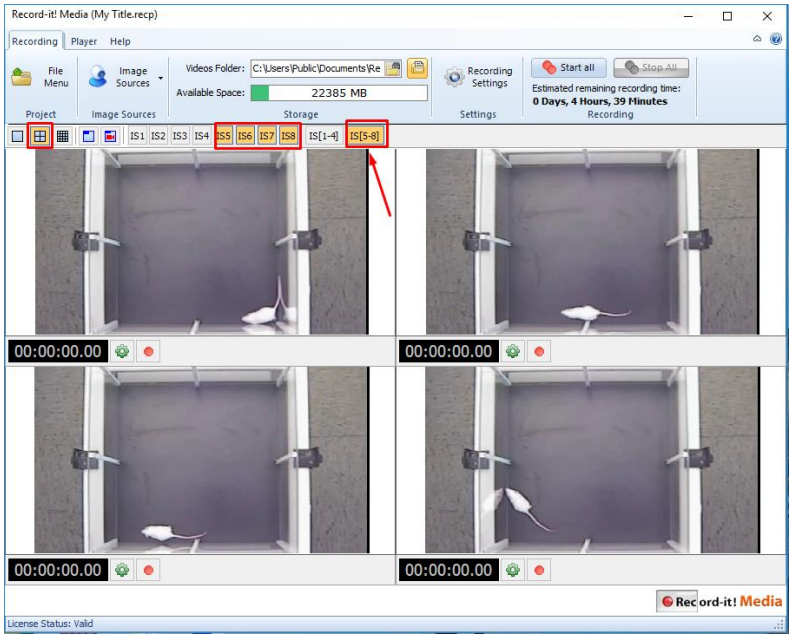


Click on the  button, then use the individual Image source selectors IS1 IS2 IS3 IS4 IS5 IS6 IS7 IS8 to switch from one image source to another one.

4.3.3. Four image sources view

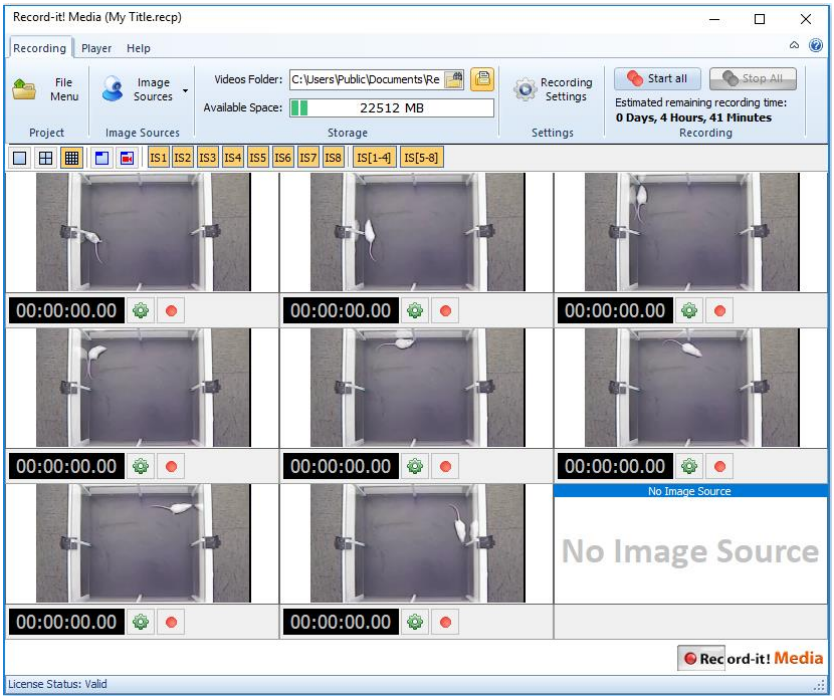
Click on the  button, then use the 2X2 Image source selectors IS[1-4] or IS[5-8] to switch from a set of 4 image sources to the other set of 4 image sources.





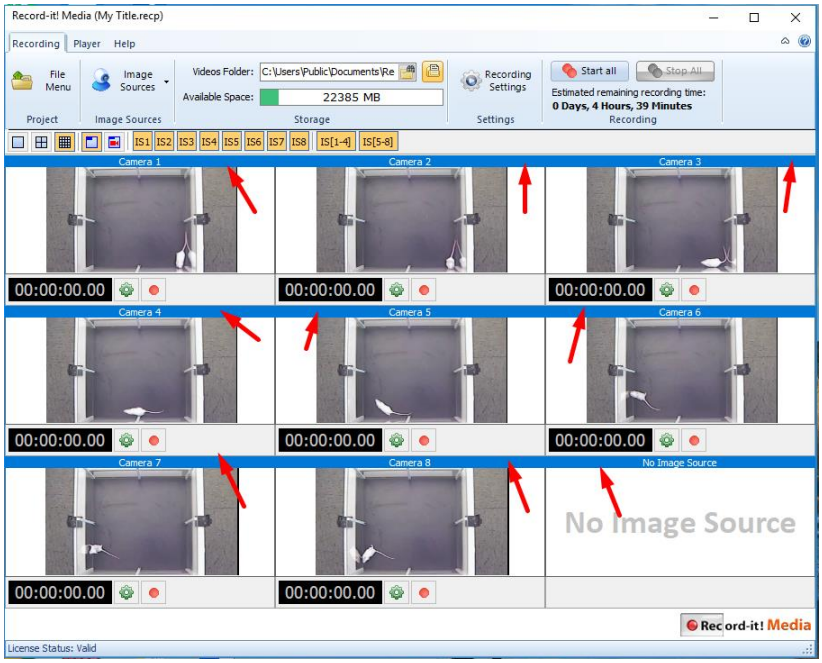
4.3.4. Eight image sources view

Click on the  button to diplay the view of all available cameras.



4.3.5. Show/Hide the Image source names

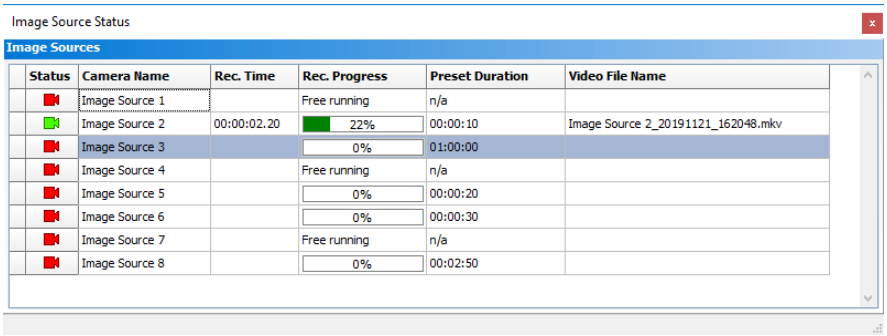
Click on the  button to show or hide the name of each image source.



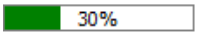
4.3.6. Show/Hide the Image Source Status panel

The Image Source Status panel provides a summary view of the recording status of all the available image sources/cameras.

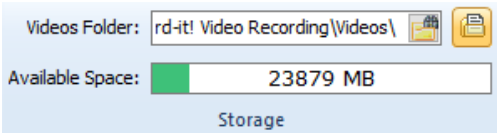
Click on the  button to show or hide the Status of each image source.



An Image Source Status table is displayed with the following content:

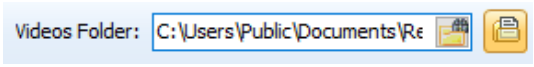
Status	Status of the image source:  Recording  Not recording
Camera name	Name of the camera defined in the Recording Settings
Rec. Time	Current recording time elapsed from the start of the recording process. Expressed in HH:MM:SS.oo.
Rec. Progress	Recording progress • Free running text is shown when the **Free running** option is set from the Recording Settings panel. •  time progression bar is shown when a **preset duration** is selected from the Recording Settings panel.
Preset Duration	Recording duration set from the Recording Settings panel. • n/a (does not apply) is shown when the **Free running** option is set from the Recording Settings panel. • The preset time is shown when a **preset duration** is set from the Recording Settings panel. Expressed in HH:MM:SS.
Video File Name	Name of the recorded digital video file.

4.4. Storage

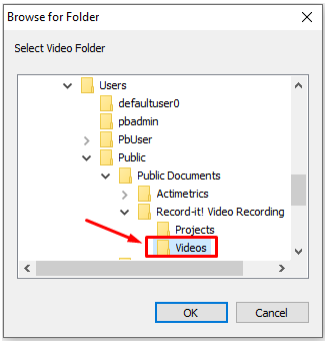


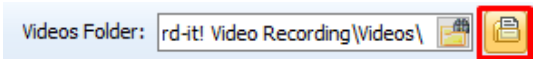
4.4.1. Videos Folder

The Videos Folder shows the Video file path set to save the recorded video file.

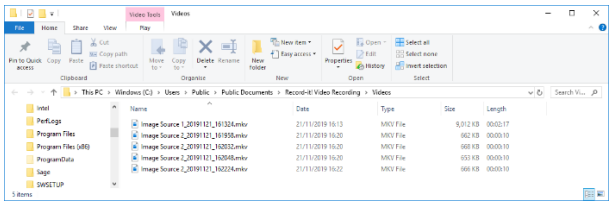


This path can be changed from the Recording main panel by clicking on the Browse Folder button and selecting the new folder selected for saving the recorded video files.



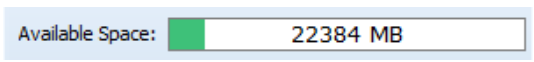


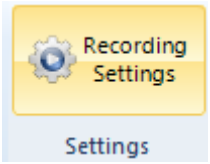
The **Open Videos Folder**  button can be used to open the videos folder and access the content.



4.4.2. Available Space

The Available Space section shows a bar indicating the *approximate* remaining hard drive space available for recording video files.



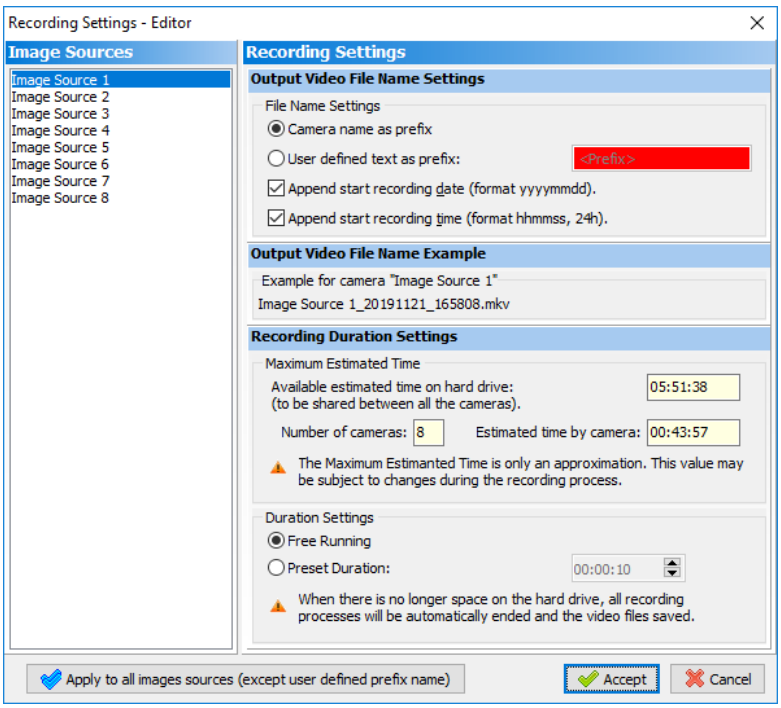


4.5. Recording Settings

The Recording Settings main button leads to the Recording Settings Editor.

In the Recording Settings Editor, the user can define:

- The output name of the recorded video digital files
- The duration of the recording process



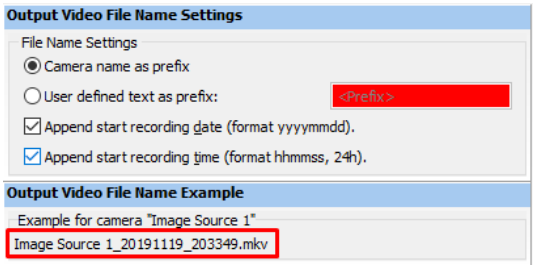
The settings applied in the **Recording Settings** section correspond to the image source selected in the left **Image Sources** panel. If the user selects another Image Source, the Recording Setting panel updates content accordingly.

4.5.1. Output Video File Name Settings

Define the name of the video file recorded from the selected image source in the **Output Video File Name Settings** section and then check the result in the **Output Video File Name Example** section.

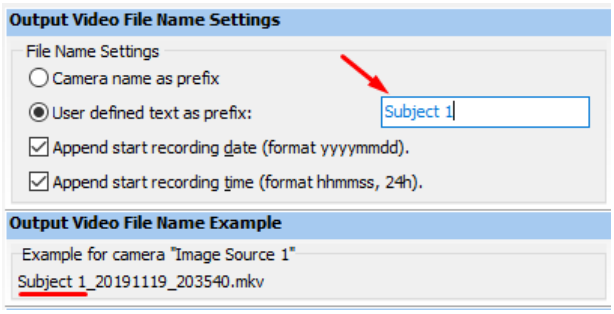
4.5.1.1. Use the Camera name as prefix

- Select the Camera name as prefix option.



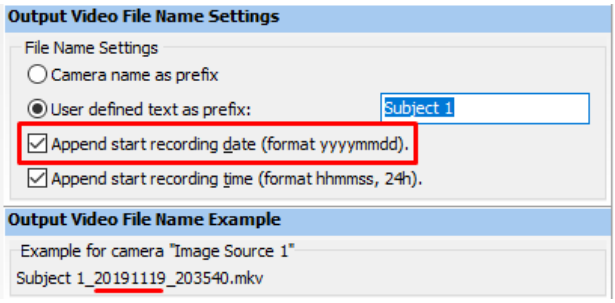
4.5.1.2. Enter user defined text as prefix

- Select the User defined text as prefix option.
- Enter the text to be used as prefix (“Subject 1” in the example below)



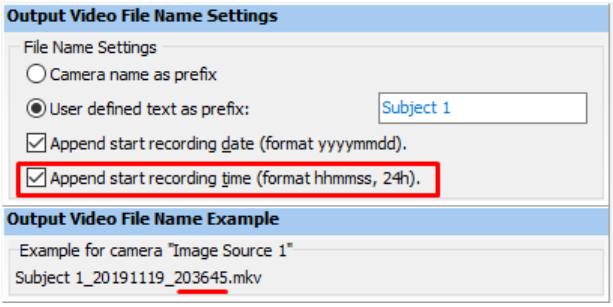
4.5.1.3. Add the date to the video file name

- Select the Append start recording date (format yyyymmdd) option.



4.5.1.4. Add the time to the video file name

- Select the Append start recording time (format hhmmss, 24h) option.



4.5.2. Recording Duration Settings

RECORD-IT! MEDIA provides a specific panel for managing the recording start/stop conditions and duration.

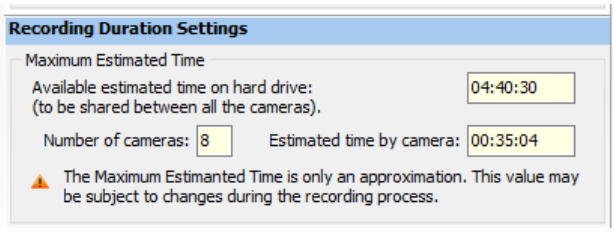
4.5.2.1. Maximum Estimated Time

RECORD-IT! MEDIA provides information about the maximum available recording space and time. These values depend on several factors, but the following are the most important:

- Number of cameras recording at the same time.
- Image quality (pixel & frame rate) of each recording camera.

- Free space of the hard disk where video files are stored.

The program will estimate the maximum recording duration based on the amount of available space detected on the hard drive. Estimates are provided for the total available recording time as well as for the time available to each individual camera feed. The latter is calculated by dividing the total available time by the number of cameras.



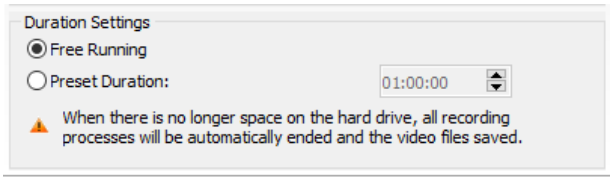
Note that the actual recording limit may be different than the value estimated. It may also vary suddenly if conditions change. Examples include changes in video activity (e.g. if the animal begins sleeping, causing a reduction of activity in the video image) or changes to computer resources due to concurrent use of other programs.

When the recording process reaches the maximum available space, RECORD-IT! MEDIA will automatically stop recording and save the video files from all cameras to prevent taking up all the hard disk space.

The estimated time available will be automatically recalculated if additional cameras start recording. **Please check the estimated time periodically to avoid losing the data.**

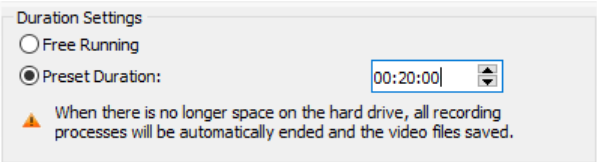
4.5.2.2. Free running

When the **Free Running** option is selected, the recording start and stop times are controlled manually by the user.



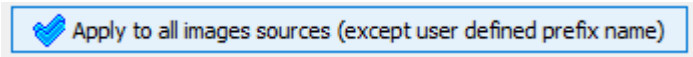
4.5.2.3. Preset Duration

When the **Preset Duration** option is selected, the user starts the recording process manually, and recording stops automatically when the preset duration time has elapsed.

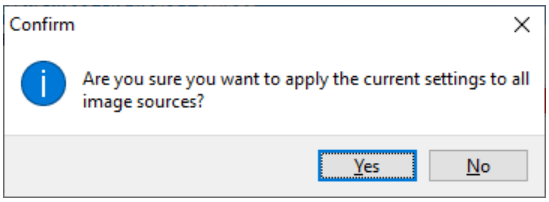


4.5.3. Apply All option

Click on the **Apply to all images sources** button to apply the same settings to all image sources. All settings but the camera name and user defined prefix will apply when selecting this option.



A message will appear for confirmation.



4.6. Recording Start/Stop

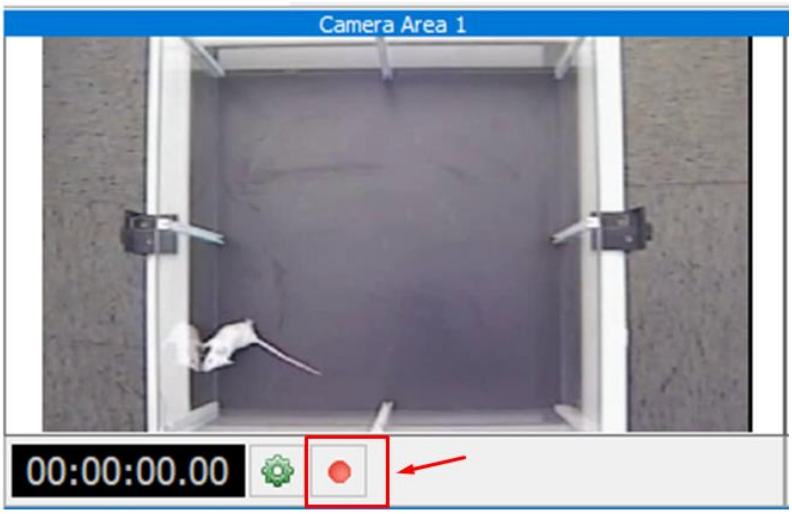
It is highly recommended that Windows Updates are disabled, otherwise this can cause serious problems to the ongoing recording sessions. To see if they are enabled, go to Control Panel->Windows Update.

The recording process can be started from two locations on the main Recording panel:

- Individually from each camera player.
- Simultaneously from the Recording section of the main menu.

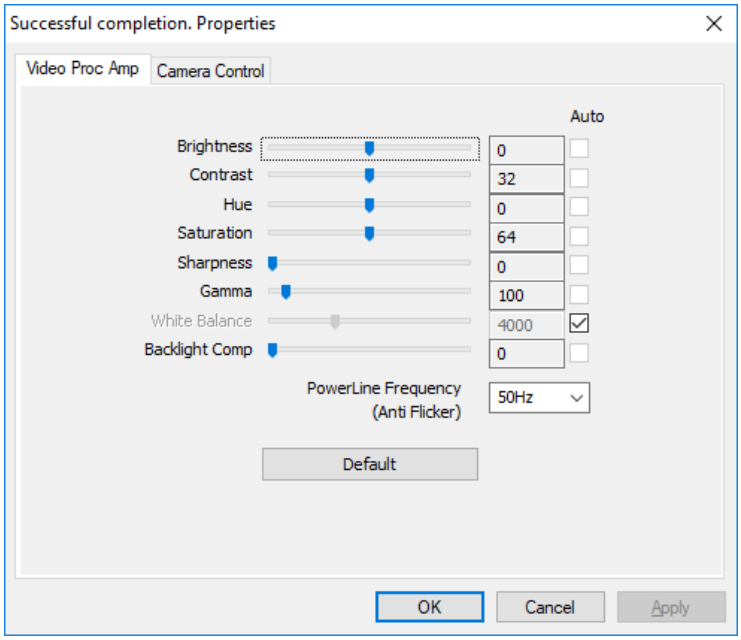
4.6.1. Individual start/stop

Click on the button to individually start recording from each image source.



- The time panel color will switch from grey 00:00:00.00 to red 00:00:02.40 and show the current recording time.
- The red RECORD button will switch to the green Stop button.

- A time progression bar with a cursor  will be displayed, showing the progress of the recording time.
- The Show Live Image button  is activated by default. Click on this button  to pause the on-screen image refresh process. The cursor may then be moved to visualize the images currently recorded.
- Click on the  button to access to the Image Source properties. Below are the properties available from a connected webcam:

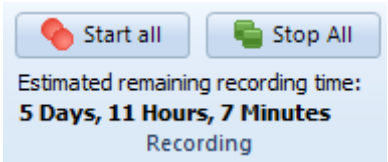


The settings of the camera may be changed, applied, and then saved in the project file.

When no properties are available, clicking on the Settings button has no effect.

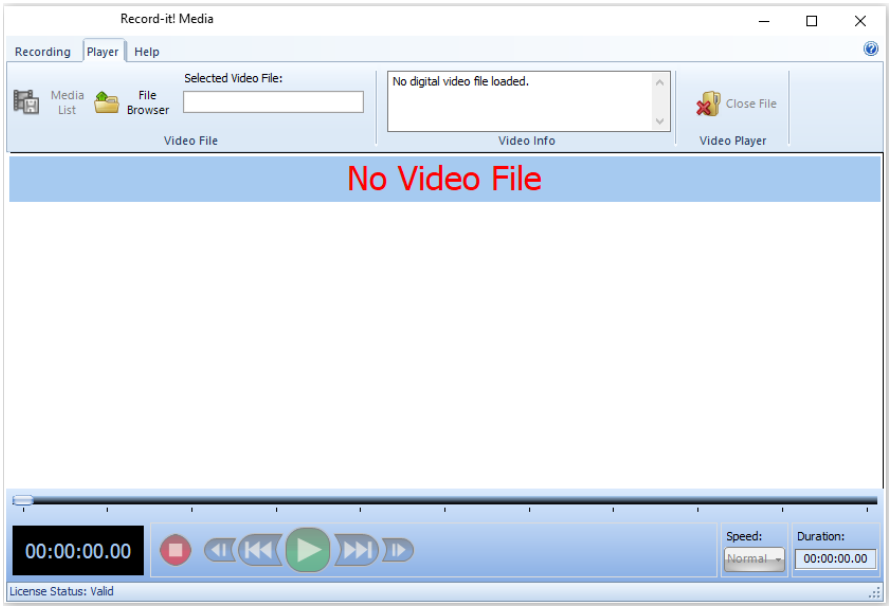
4.6.2. Simultaneous Start All/Stop All button

A Start All/Stop All button is available from the Recording section of the main menu.



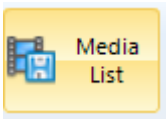
5. PLAYER

Select the **Player** main menu to access the Player section.



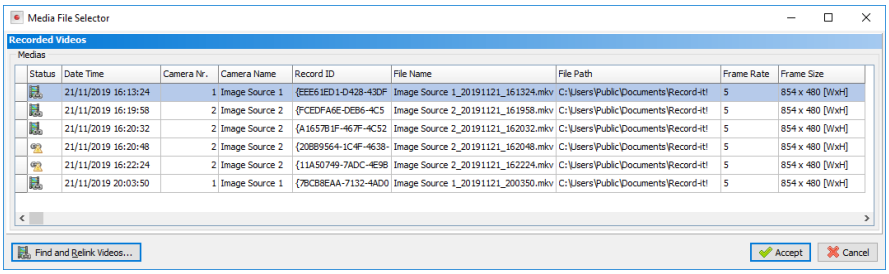
5.1. Open a video file

5.1.1. Open a video file through the Media List



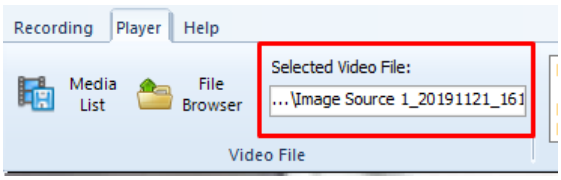
5.1.1.1. Media File Selector

Select the **Media List** menu to open the Media File Selector



Select a video and then click on the **Accept** button to open it into the RECORD-IT! MEDIA Player.

Once selected, the name of the video file will be shown in the Selected Video File text box.



The Media File Selector table provides the following information:

- Status:

The Status column indicates the link status of the video.

  -  : linked videos icon - RECORD-IT! MEDIA can find the video on the computer and open it through the Recorded Videos Media table.
  -  : unlinked videos icon - the linked video cannot be found (the file has been deleted in the computer or the file name has been changed).

- Date Time

Date/Time of the video file recording.

- Camera Nr.

Index number of the camera (Internal RECORD-IT! MEDIA index number from the 8 possibilities).

- Camera Name
- Name of the Image source defined in the Image Source Settings panel.

- Record ID

Internal ID code provided by RECORD-IT! MEDIA. This code is unique for each video file.

- File Name
- Name of the recorded video file defined in the Recording Settings panel.

- File Path

Path to the Recorded video recording folder.

- Frame Rate

Frame rate of the recorded video expressed in frame per seconds (fps).

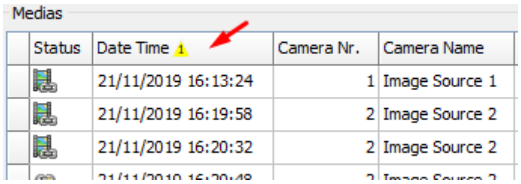
- Frame size

Frame size of the recorded video expressed in pixels.

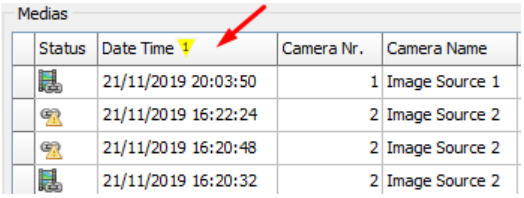
5.1.1.2. Rearrange the information in the Medias List table

The information in the Medias table can be sorted by columns to find a specific video more easily.

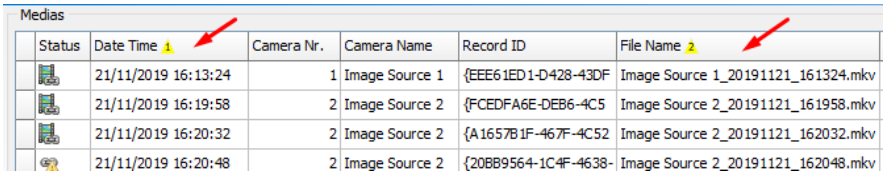
- Select the title of one column to sort the information of this column by alphabetical order. 1



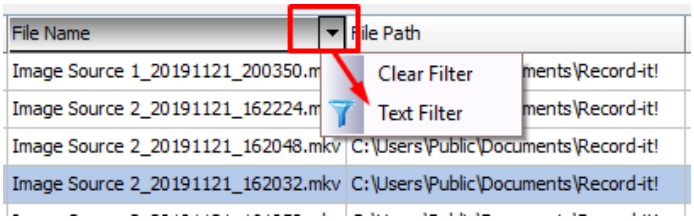
- Click again on the same column title to sort the information of this column in reverse alphabetical order. 1



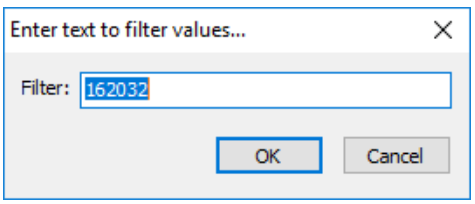
- While holding down **Shift** on the keyboard, click on the title of the second column to add a second level of rearrangement. 2 or 2 .

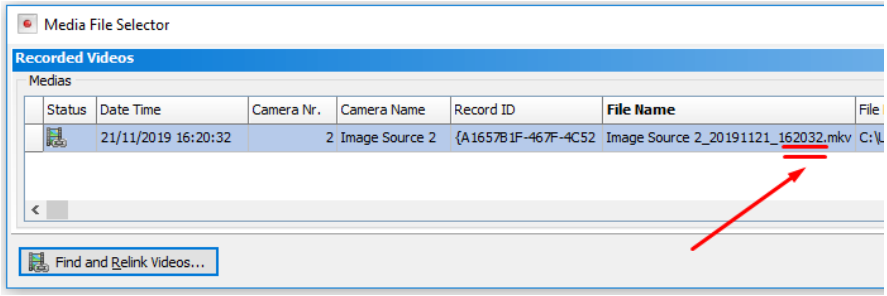


- The content can also be searched through a user-defined filter.
  - Click on title of one column, click on the right arrow to display the dropdown menu and select the **Text Filter** option.

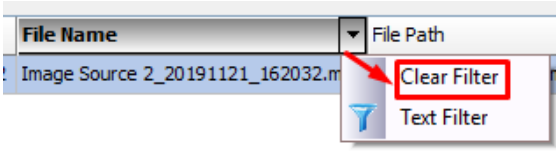


  - Enter the text used to filter the information and then click on the **OK** button.





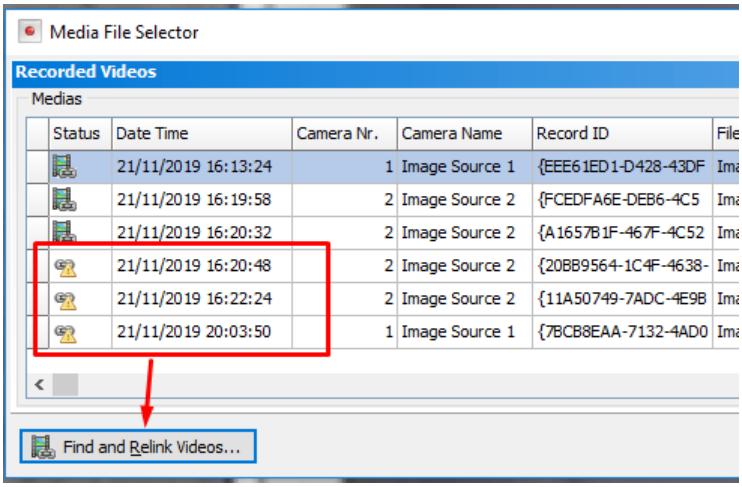
- Select the Clear Filter option to remove the filter and recover the full content of the table.



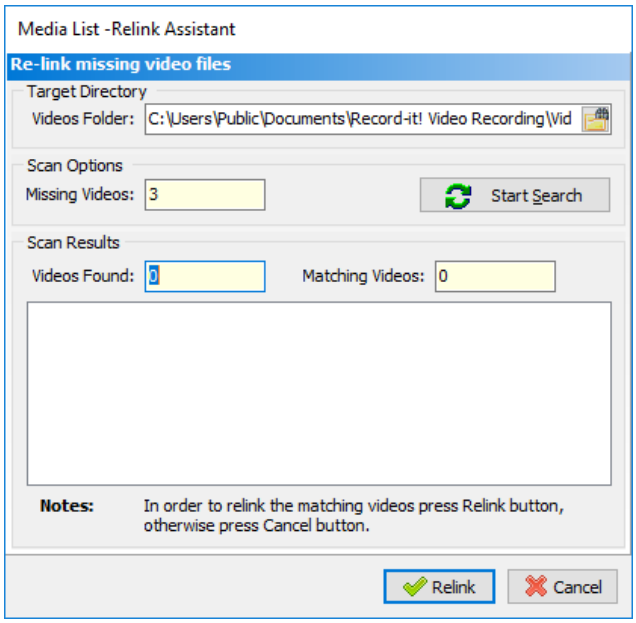
5.1.1.3. Find and Relink Videos

A video can be unlinked for 2 reasons: (1) the name of the file has been changed or (2) the video file has been deleted from the computer.

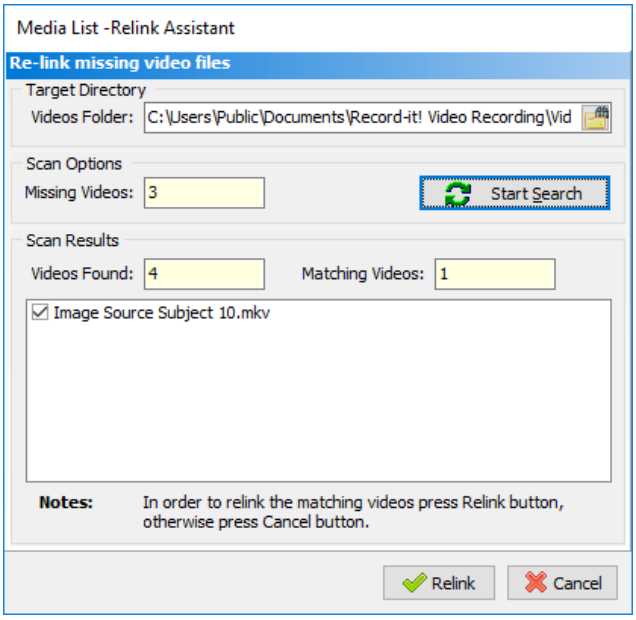
The unlinked videos can be relinked by using the **Find and Relink Videos…** button.



- Select a Folder in the **Target Directory** Video Folder section. The Scan Option section indicates the number of Missing Videos (here 3 videos are missing).

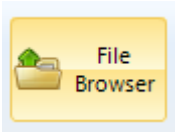


- Click on the Start Search button to scan the folder. The Scan Results section will indicate the number of Videos Found in the folder as well as the number of videos matching the missing videos (Matching Videos). In the following example, only 1 of the missing videos has been retrieved. The 2 other videos are still missing (they have been deleted or moved to another folder…).

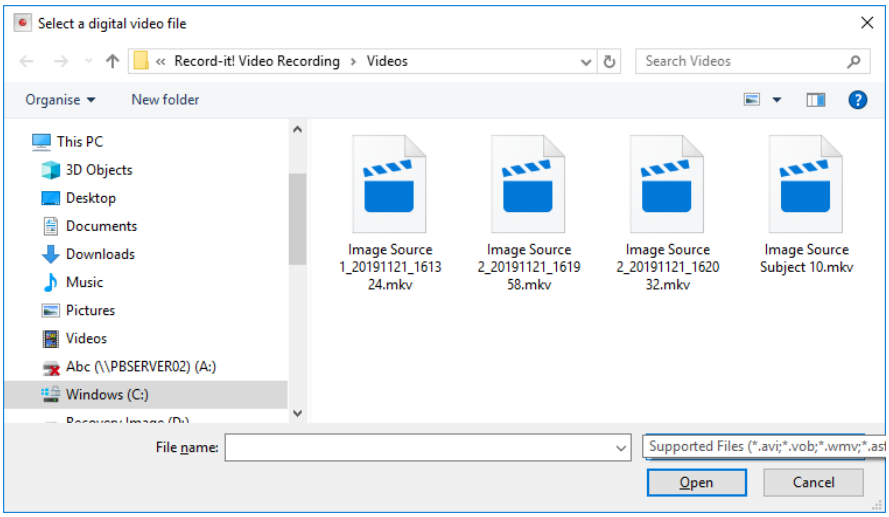


- Click on the Relink button to relink the video file.

5.1.2. Open a video file through the File Browser

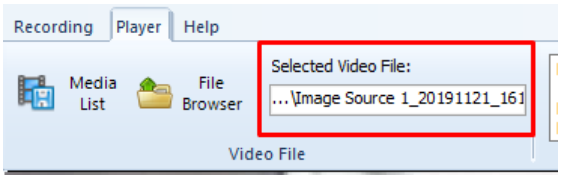


Select the **File Browser** menu to open the Select a digital video file window.



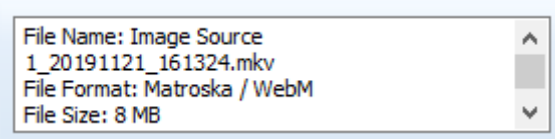
Select a video and then click on the **Open** button to open it into the RECORD-IT! MEDIA Player.

Once selected, the name of the video file will be shown in the Selected Video File text box.



5.2. Video file information

Information about the video file is displayed in the **Video Info** main menu section.



Use the right scroll down tool to view the complete video information. This information can be copied and pasted to another program, such as Word. See example of copied/pasted information below.

File Name: Image Source 1_20191121_161324.mkv

File Format: Matroska / WebM

File Size: 8 MB

File Date: 21/11/2019

Frame Size: 854 x 480

Frame Rate: 5.000 FPS

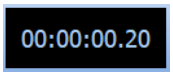
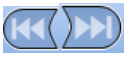
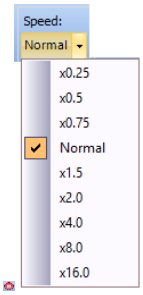
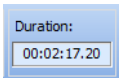
Video Bitrate: 0 bps

Video Codec: h264(H.264 / AVC / MPEG-4 AVC / MPEG-4 part 10)

Audio Info n/a

5.3. Player controls

RECORD-IT! MEDIA Player has onscreen controls like those found on standard video digital players.

	Timeline with play-head cursor
	Time (HH:MM.SS,00)
	Play/Pause buttons
	Fast-Rewind/Fast-Forward buttons (each 10 frames steps)
	Frame-by-frame Rewind/Forward buttons
	Player speed settings
	Total duration of the video file
	Stop button

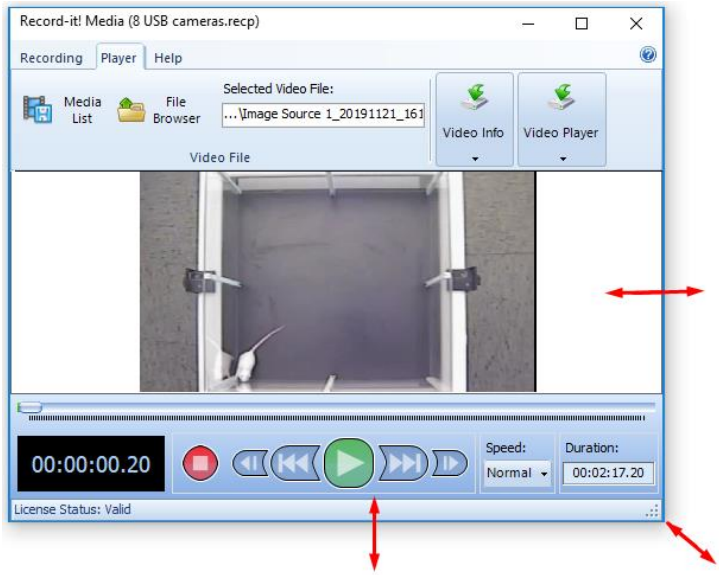
Use the controls to play, pause, rewind, fast-forward, jump to a specific frame/time, adjust the speed, or end.

To go to a specific point in the video file, drag the play-head (in the timeline).

To step through frame-by-frame, you may also first click the play-head and then click on the Right or Left Arrow keys on your keyboard.

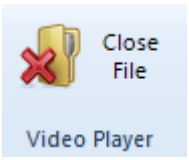
5.4. Resize the player

The Player can be resized by dragging the lower-right corner or the lateral sides of the window (a white arrow will appear when the cursor hovers over the resize white arrow tool).

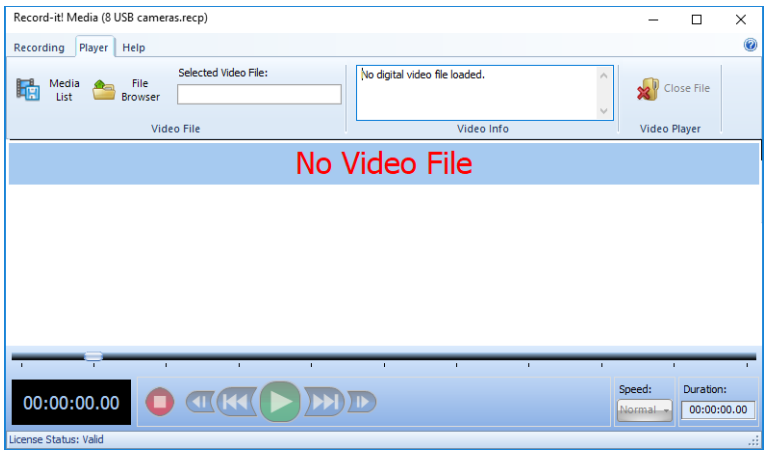


The proportions of the image of the video will not be affected by the resize operation.

5.5. Close a video file

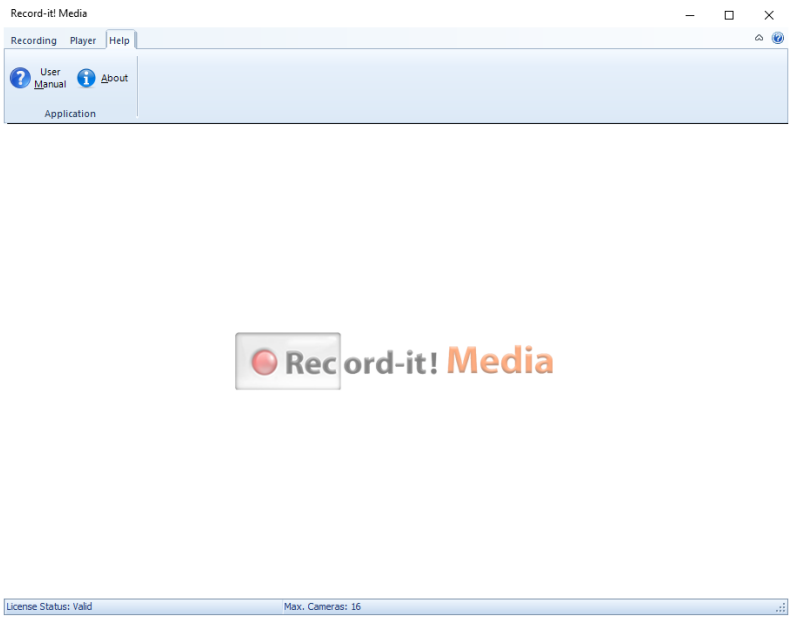


Use the Close File menu to close the video file and empty the RECORD-IT! MEDIA player.



6. HELP

Select the **Help** main menu to access the Help main panel.



- If you have questions about the application's usage, select the **User Manual** menu option or click on the **F1 key** to open this document.

- For further information, select the **About** menu option.

The first information panel provides important information for technical support purposes:

- Software Serial Number
- Operating system/computer information

- Click on the **More Info**. Button to view our contact information.

7. INTEGRATE RECORD-IT! MEDIA IN A 3RD PARTY APPLICATION

RECORD-IT! MEDIA can be used by another application (3rd party system) to provide video recording capacity and to facilitate data synchronization.

A communication protocol for RECORD-IT! MEDIA can be developed using an API (Application Programming Interface). The API allows for external programs to send commands to and receive responses from RECORD-IT! MEDIA.

Find below the list of commands available from RECORD-IT! MEDIA:

- Load a configuration project file,
- List configured cameras,
- Start recording using the camera "camera name",
- Stop recording from the camera "camera name",
- Play a video file indicating its "file path", starting at position “seconds” (time stamp).

In order to use RECORD-IT! MEDIA as a third-party application with your software, please refer to the technical specifications listed in the document present in the USB key license. Contact us for more information.

8. CONTACT INFORMATION

We are available to help you with your questions and concerns. Should you hit a roadblock or need some additional training, please feel free to visit the HBIO Behavioral Support Center at https://support.behavior.hbiosci.com to find articles and helpful information in our knowledge base or submit a ticket. We are happy to help!

PANLAB

Carrer de l'Energía 112

08940 – Cornellà de Llobregat

Barcelona - SPAIN

Technical Support

Email: support@panlab.com