

IVS - Registration and management of custom devices, cameras

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1. Introduction, important information

This guide provides details on managing and registering the devices listed below. For a complete overview of the system architecture and configuration, please refer to the *IVS Installation Manual* documentation.

- Intellio Orio, Visus camera
- Intellio ILC, ILN, ILE devices
- rtsp video/audio stream
- http/mjpeg video stream
- AXIS, Bosch devices
- Multicast UDP stream

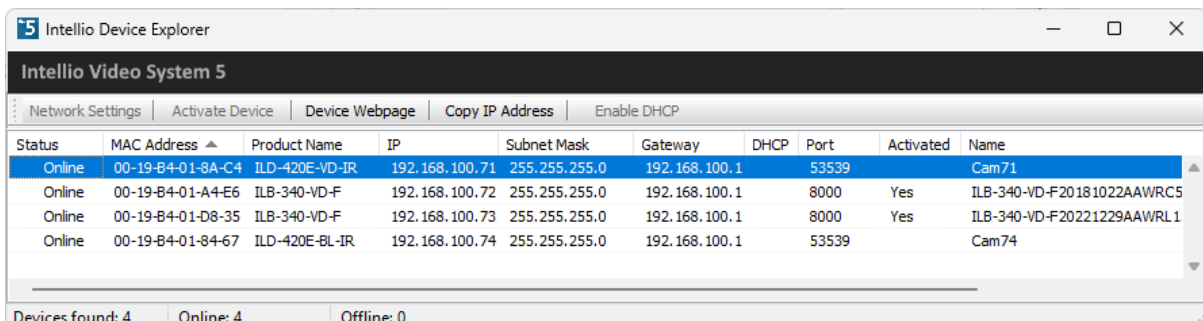
2. Search, add, register devices, cameras

2.1. Searching for cameras using the Intellio Device Explorer program

In the Intellio Video System server folder or in the Windows Start menu under the Intellio Video System group, you can find the **Intellio Device Explorer**, which allows you to search Intellio Orio and Visus (ILD) cameras.

After launching, the program continuously scans the network for cameras and displays the detected devices in an automatically updating list. Right-click on the camera you want to configure to open a pop-up menu with available functions for that specific camera model. Alternatively, left-click the desired camera and use the functions that become active in the program's header:

- Click the **Device Webpage** button to open the camera's web interface in Internet Explorer.
- **Copy IP Address**: copies the device's IP address to the clipboard. You can paste this address into a browser to open the camera's web interface, or use it in IVS when manually adding the camera.



2.2. IVS Search function

IVS can search for Intellio Orio/Visus (ILD) cameras on the subnets accessible by the server. Cameras discovered using **System Configuration / Devices / Search / Search for Intellio Orio/Visus (ILD-xxx) devices...** will appear under the **Unregistered** panel.

To register the Orio/Visus cameras found during the search, authentication is required, but the default username and password fields are automatically filled in. However, if you have changed the camera's default password, select the desired camera from the list and open the **Connection** tab.

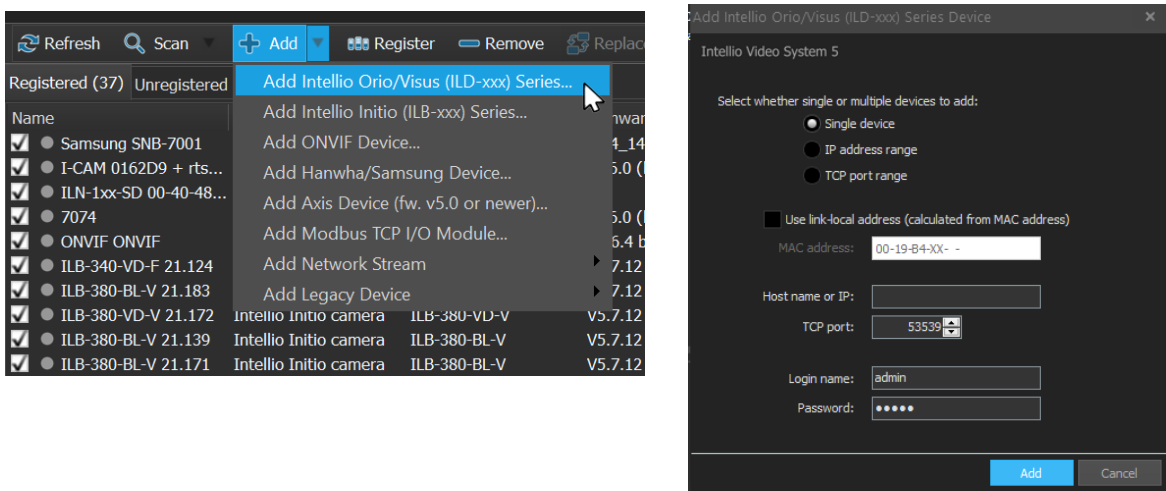
This tab shows the default username, the camera's IP address, and its port number. You can paste the IP address into a browser to access the camera's web interface and identify it. Then click the **Edit** button and enter the correct username and password for the camera. After that, click **Refresh** and proceed with registering the camera.

Sometimes not all cameras are found on the first search; in that case, run the search again. It's important to note that cameras can only be found if their IP address is within the range visible to the server. Although it may take longer, this is the easiest way to locate devices on the network.

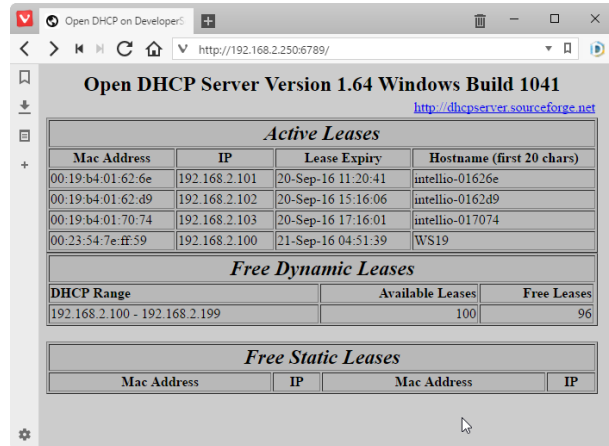
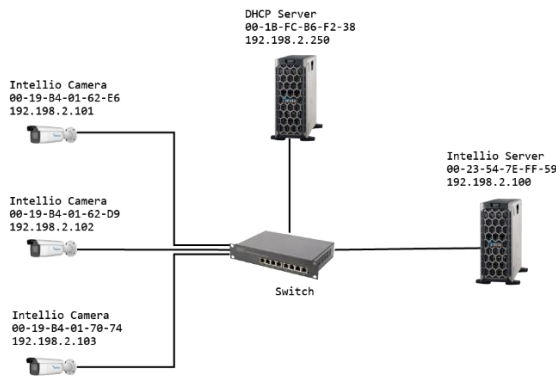
If the cameras still cannot be found, make sure the multicast protocol is not disabled on any active network components. If everything seems perfect, but certain cameras are still not found, you can add them manually.

2.3. Add Intellio Orio/Visus cameras manually

To manually add ILD series cameras, use the **Add / Add Intellio Orio/Visus (ILD xxx) series...** button.



By default, Intellio Orio/Visus cameras use IP addresses assigned by a DHCP server. In the example below, there is one Intellio server and three Intellio cameras on the same network. Using the built-in query interface of the DHCP server, you can view the connected devices and the IP addresses assigned to them by the DHCP server.

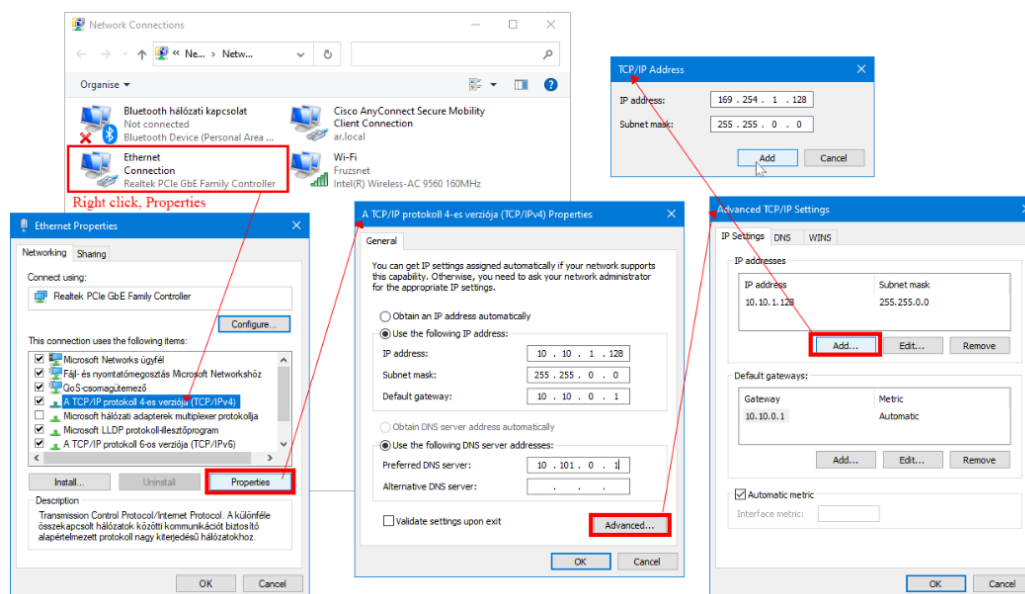


In some cases, there may be no DHCP server on the network, so Intellio Orio/Visus cameras will not receive an IP address automatically. In this situation, the cameras calculate their IP addresses based on their MAC addresses as follows: **169.254.(2nd byte of MAC address in decimal).(1st byte of MAC address in decimal)**. For example: If the camera's MAC address is **00-19-B4-00-42-1A**, then its IP address will be **169.254.66.26**. For convenience, instead of entering the IP address of the camera to be added, you can also enter the camera's MAC address. When you enter the MAC address, the corresponding IP address will appear in the window. You can also use the conversion table below as a reference.

How to use the table: Find the row that corresponds to the first character of the byte, and the column for the second character. The cell where they intersect contains the decimal equivalent of the hexadecimal byte. Eg.: **0x42 = 66**, **0x7B = 123**

		Second character															
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
First character	0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
	3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
	4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
	5	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
	6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
	7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
	8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
	9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
	A	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
	B	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
	C	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
	D	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
	E	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
	F	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Before adding ILD cameras into the server, a link-local address must be set to the server PC. To do this, follow these steps:

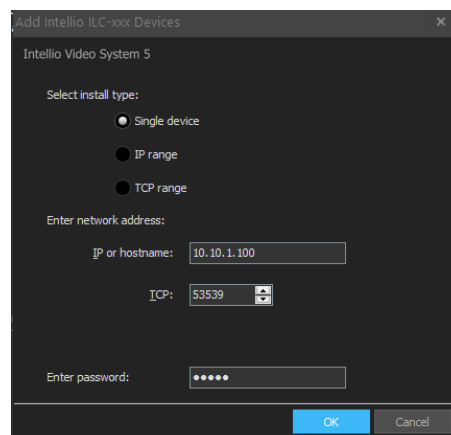


- Select **Start menu / Run...** menu (**Windows + R** keys).
- Type in the **ncpa.cpl** command, then click on **OK**.
- Click on the icon of the connection in use with the right mouse button and select the **Properties** menu item.
- Go to **Internet Protocol Version 4 (TCP / Ipv4) / Properties** window and select the **Use the following IP address:** radio button. Set the following:
 IP address: **169.254.x.x**
 Subnet mask: **255.255.0.0**
 Default gateway: **x.x.x.x**
- If there is already an IP address set here, click on **Advanced...** button then **Add...** Type the above listed settings here.
- After these settings are set use **Scan** or **Scan / Scan ILD devices** to find cameras on the network.

2.4. Add Intellio ILC cameras

To add a camera, follow these steps:

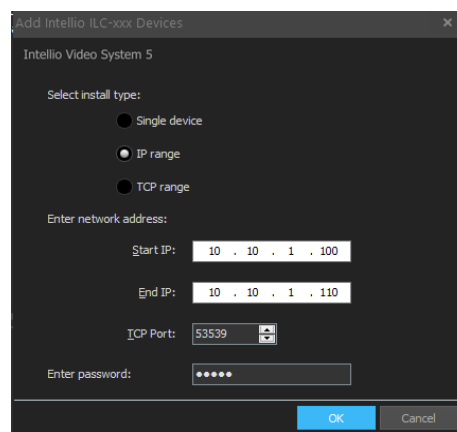
- Click on **Add / Add Legacy Device / Add Intellio ILC-xxx Series...** button.
- Select radio button **Single device**.
- Enter the **IP or hostname** of the camera.
- Click **OK** button



The screenshot shows a dialog box titled "Add Intellio ILC-xxx Devices" for "Intellio Video System 5". It has three radio buttons under "Select install type": "Single device" (selected), "IP range", and "TCP range". Below, there are input fields for "Enter network address:" with "IP or hostname:" set to "10.10.1.100" and "ICP:" set to "53539". A password field is also present. "OK" and "Cancel" buttons are at the bottom right.

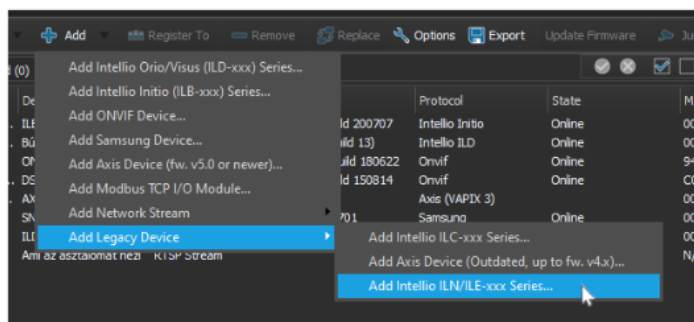
The ILC cameras can be added to the server in a group. To do this, the steps to be followed are:

- Click on **Add / Add Legacy Device / Add Intellio ILC-xxx Series...** button.
- Select radio button **IP range**.
- Enter the **Start IP** and the **End IP** of the selected range of the cameras.
- Click **OK** button.



The screenshot shows the same dialog box but with the "IP range" radio button selected. The "Enter network address:" section now has "Start IP:" set to "10 . 10 . 1 . 100" and "End IP:" set to "10 . 10 . 1 . 110". The "ICP Port:" is still "53539". "OK" and "Cancel" buttons are at the bottom right.

2.5. Add Intellio ILN/ILE cameras



The ILN series has to be added manually to the system in the Intellio Client interface.

- Go to **System Configuration / Devices / Add / Intellio ILN/ILE-xxx Series...**
- In the popup window enter the IP address of the camera: **Host: 192.0.0.64**. (The port number can be added after a colon. For example: **192.0.0.64:8000**)

The ILN series has a built-in web server, so it is possible to connect to it and configure it by using a web browser:

IP address by default: **192.0.0.64**

Username: **admin**

Password: **12345**

Port: **8000**

Note: *If there is an error message like: "Login failed", try to stop the Intellio Video System Service and restart the camera in its own web interface. After finishing the proper password setup, you can start the Intellio Video System Service.*

It is recommended to change the IP address because the next connected cameras' IP address will be the same (**192.0.0.64**).

2.6. Add an RTSP and other video stream

Using an RTSP or MJPEG stream, the video from any camera can be monitored if its RTSP or MJPEG URL is known. However, the monitoring options for such streams are very limited (unlike ONVIF, there is no built-in motion detection, PTZ control is typically unavailable, and the exact network URL must be known to register the device). Therefore, this method is only recommended if the camera cannot be connected to the system in any other way.

The Intellio system supports Dual-Stream handling, meaning it can use different video profiles for recording and monitoring.

For video streams, stream properties cannot be set through the client - they must be configured on the camera's own web interface. For RTSP and MJPEG streams, the same three profiles can be configured as with ONVIF cameras (see the **ONVIF devices** documentation).

The selectable stream URL must be one of those entered during device registration or later in the **Connection** tab of the registered device. If you change the URL, make sure to also check the device's **Profile Settings** (Live View, Live View – Low Resolution, Storage Profile).

For RTSP streams, audio channel handling can optionally be enabled alongside the video channel - this can also be configured here.

To add a stream, follow the steps below:

- Press the **System settings / Devices / Add** button, then click **Add network stream** and **Add RTSP-stream** or **Add MJPEG over HTTP Stream**.
- Assign a name and a description to the video stream, then the RTSP or MJPEG URLs belonging to the stream. The more URLs you assign, the more settings options you will have when assigning monitoring and storage settings (the URLs belonging to the device can be queried from the manufacturer).
- If necessary, assign a username and password to the camera.
- Select the required audio channel and provide the URL to be used by the server with the audio channel. The audio will always be streamed from this URL, so in case of Dual-Stream it is recommended to provide the URL to be used for storing video.
- **Use RTP over RTSP:** Determines whether image or audio is transmitted via the TCP or UDP channel. It is turned on by default, meaning the more reliable TCP connection. Only turn off in case the camera fails to transmit images, since it may be due to a lack of support for this transmission mode.

Add RTSP Stream Device

Intellio Video System 5

Name: RTSP video #1

Description: RTSP video+audio #1

Enter RTSP URL. Multiple URL addresses can be entered in separate lines.
You can select from them later to choose the appropriate streams for dual-streaming.
Example: rtsp://192.168.0.1/h264

rtsp://10.10.80.102:554/primary/h264
rtsp://10.10.80.102:554/secondary/h264

Enable audio

rtsp://10.10.80.102:554/primary/h264

Login name: admin

Password: •••••

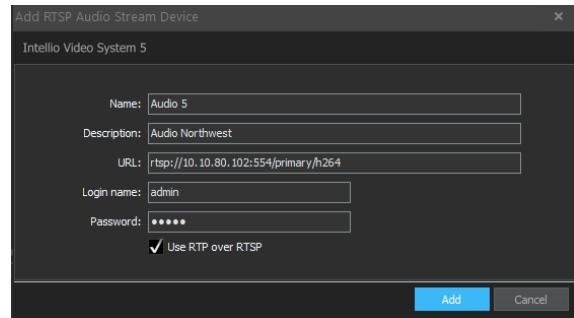
Use RTP over RTSP

Add Cancel

2.7. Add an RTSP audio device

It is also possible to add an RTSP stream that contains only audio, without video. To do this, go to the **Add Network Stream** menu and select **Add RTSP Audio Stream....**

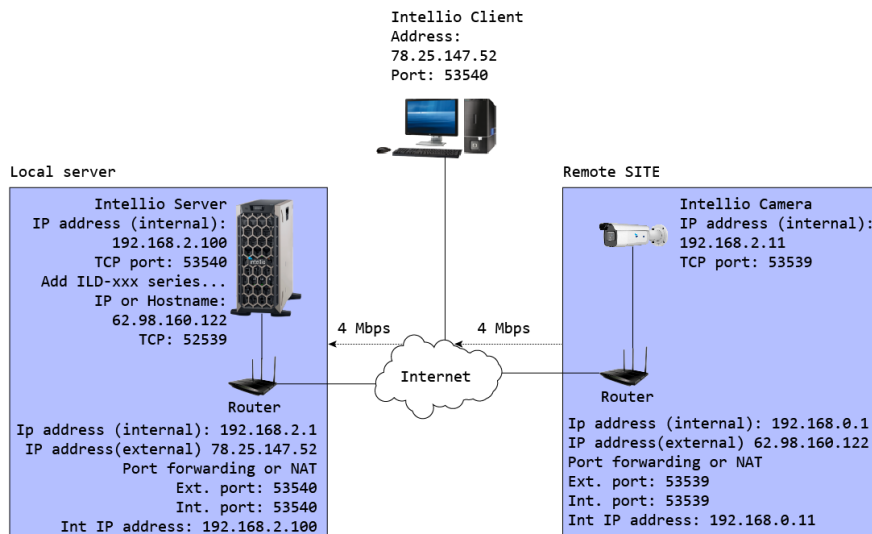
The configuration is the same as for an RTSP video stream, but here you only need to provide a single URL for the audio channel.



2.8. Add a camera with external IP address

2.8.1. Register Intellio camera into a remote Intellio Server over the Internet

This figure below demonstrates that an Intellio camera in a remote SITE is connected to one local server over the internet.



Note that a camera requires an average of 4-32Mbps of network bandwidth at maximum refresh rate and image quality.

If a camera is connected to the Intellio server via the Internet, the recommended minimum **upload** bandwidth is roughly 4Mbps per camera. If this is less, an Intellio Orio/Visus camera automatically reduces the image update frequency of the camera images sent to the server.

Note: A drop in frame rate or low image quality is not necessarily due to a camera malfunction - it may also be caused by low bandwidth between the camera and the server!

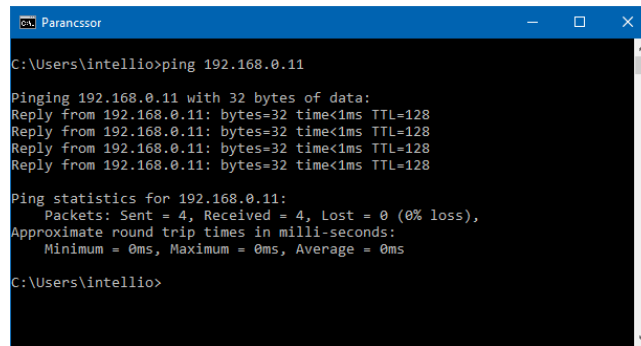
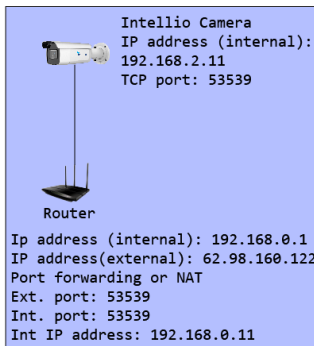
2.8.2. Assign a fix internal (local) IP address to the camera

In the Remote SITE where the camera will be installed a fix internal IP address have to be assigned for the Intellio camera. It is very important that the camera and the router have to be in the same IP range. In most of the cases the local IT can help you in this.

In our example the fix internal IP address of the camera is **192.168.0.11** (mask: **255.255.255.0**). The router has the **192.168.0.1** internal IP address (mask: **255.255.255.0**) which means the router and the camera can see each other. If you try to ping the camera on its address, you must get answer.

- Go to **Start** menu and click **Run...** button.
- Type in **cmd** and press Enter.
- Type **ping xxx.xxx.xxx.xxx** (ping camera IP) in the console and press Enter

Remote SITE



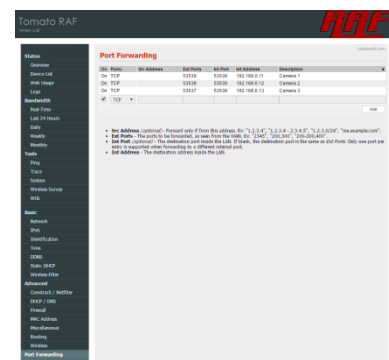
If you can see the replies, there is connection with the network device.

Megjegyzés: It is recommended to set the camera's fixed IP address before installation - in a comfortable office environment - rather than doing it on-site.

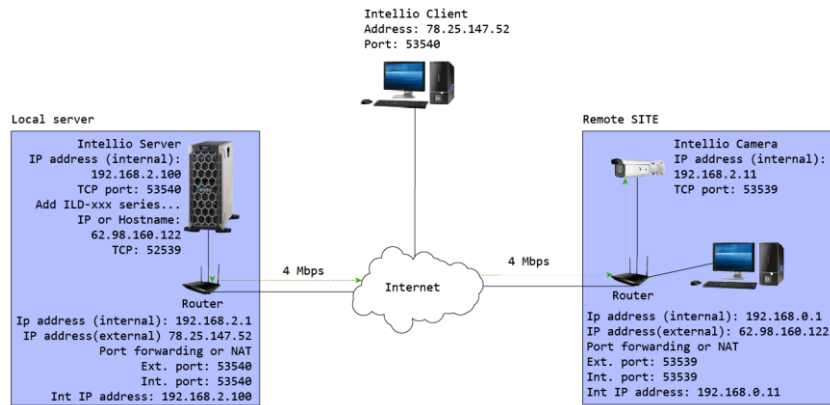
2.8.3. Setup the Port Forwarding or NAT in the Router

The main goal is to establish a connection from the Local server to the Intellio camera in the remote SITE. But in practice there are several different networks between them, so we have to set our network devices correctly to be able to connect to the camera.

We can easily get what the external address of the Remote SITE is. This address clearly identifies the Remote SITE where the camera is installed. The easiest way to get this address by opening a web browser on the server PC and type the <https://www.google.com/search?q=ip&hl=en> URL.



The external address is not enough to find the camera in the network because behind the router there are several other network devices which have different internal IP addresses. It has to be defined in the router that we are looking for our camera in the internal network (LAN) which has a fix IP address. In case the external IP address is dynamic (changing all the time), DNS can be used which will be translated to the current IP address.



At this phase the TCP Port of the camera will be used which will identify the camera in the internal network or LAN (Local Area Network) if the router is set up this way. The router has to be told that the request from the server is looking for a network device which has the **53539** TCP Port and **192.168.0.11** IP address.

Port Forwarding

On	Proto	Src Address	Ext Ports	Int Port	Int Address	Description
On	TCP		53539	53539	192.168.0.11	Camera 1
On	TCP		53538	53539	192.168.0.12	Camera 2
On	TCP		53537	53539	192.168.0.13	Camera 3

TCP

- **Src Address (optional)** - Forward only if from this address. Ex: "1.2.3.4", "1.2.3.4 - 2.3.4.5", "1.2.3.0/24", "me.example.com".
- **Ext Ports** - The ports to be forwarded, as seen from the WAN. Ex: "2345", "200,300", "200-300,400".
- **Int Port (optional)** - The destination port inside the LAN. If blank, the destination port is the same as **Ext Ports**. Only one port per entry is supported when forwarding to a different internal port.
- **Int Address** - The destination address inside the LAN.

This information can be set in the web interface of the router. In the example below the router has been set to send the request to the internal address and port of the camera. The External Port is a request (to make setup easier the same port as the internal port of the camera had been set).

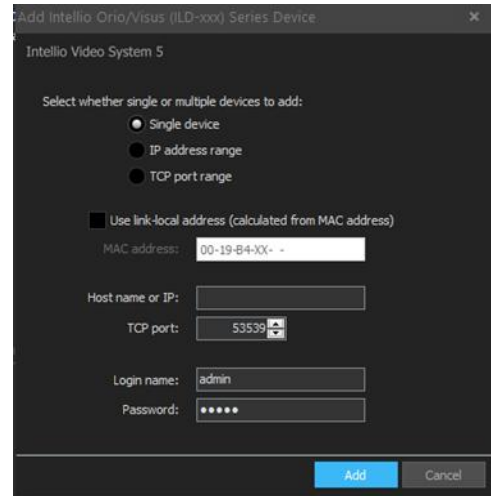
The connection request which is sent from the server to the router will be **62.98.160.122:53539** (External address of the SITE and External Port) which will be forwarded to the **192.168.0.11:53539** network device; so, to the camera.

In case of several cameras the port forwarding has to be done in the same way just set a different External port number of the request. This means the **62.98.160.122:53538** request will be forwarded to the **192.168.0.12:53539** camera. The **62.98.160.122:53537** request will be forwarded to the **192.168.0.13:53539** camera.

2.8.4. Add the camera to the server

After completing all necessary settings, all that remains is to add the camera to the server. Connect to the server using the client, then go to **System Configuration / Devices**, click the **Add** button, and select the appropriate Intellio camera type.

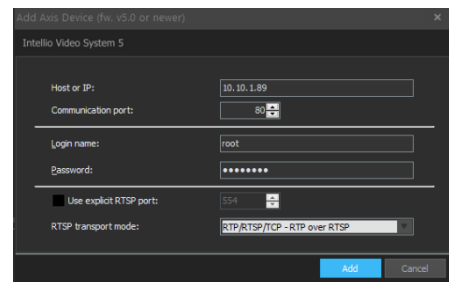
The camera will then appear under the **Unregistered** tab. Pressing the **Refresh** button will update their information.



2.9. Add Axis and Bosch Devices

To add Axis or Bosch devices to the system, follow these steps:

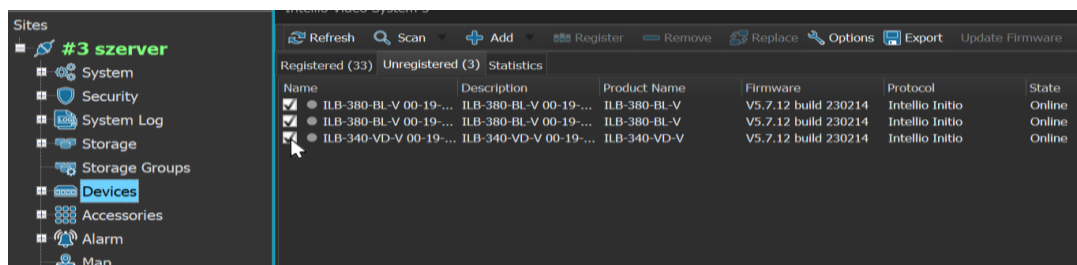
- Select **System Configuration / Devices / Add** button, and select **Add Bosch Device...** or **Add Axis Device...**
- Enter the **IP address** manually into the Host field and enter the **Login name** and **Password** of the device.



Note: It is advisable to use this type of connection if the given Axis or Bosch camera is so old that it has not yet supported the ONVIF protocol.

3. Register cameras

All devices must be registered to a SITE, and a primary server must be assigned. The primary server handles the storage of video and data from its associated cameras and devices.



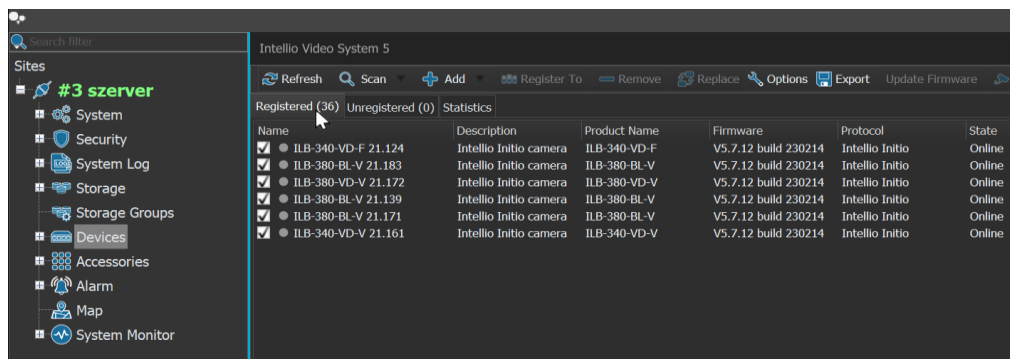
Cameras that have been added to the system but not yet registered appear under the **Unregistered** tab in **System Configuration / Devices**. These cameras maintain partial data communication with the system, meaning the displayed information is always kept up to date.

To register a camera, select the desired devices and click the **Register** button. In the pop-up window, assign the camera's primary server.

For certain cameras, a username and password must be entered before registration. Enter these credentials under the **Connection** tab of the selected camera, then click **Refresh**. After entering the required information, confirm the registration.

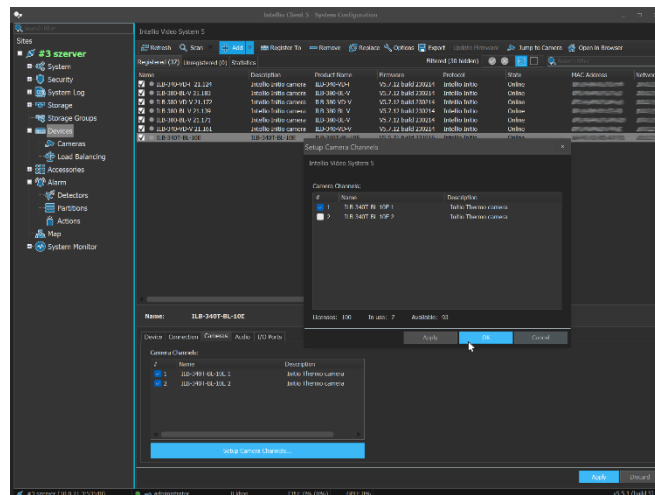
Once registered, the cameras will establish a video connection with the server and begin streaming video.

Registered cameras will appear under the **Registered** tab.



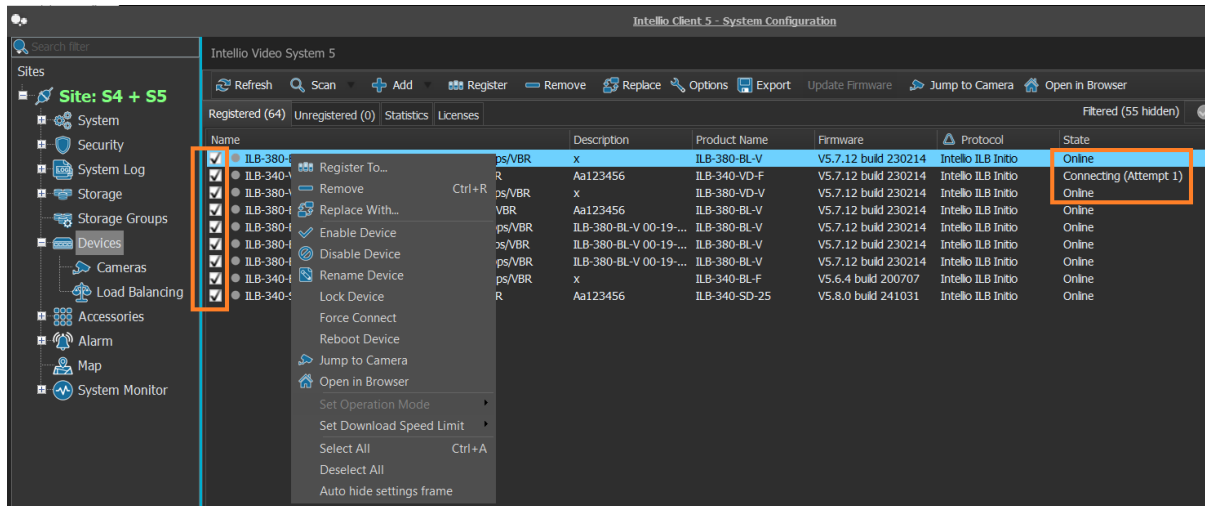
3.1. Multichannel devices

For devices with multiple video inputs, unused inputs can be disabled. Disabled inputs do not consume camera licenses.



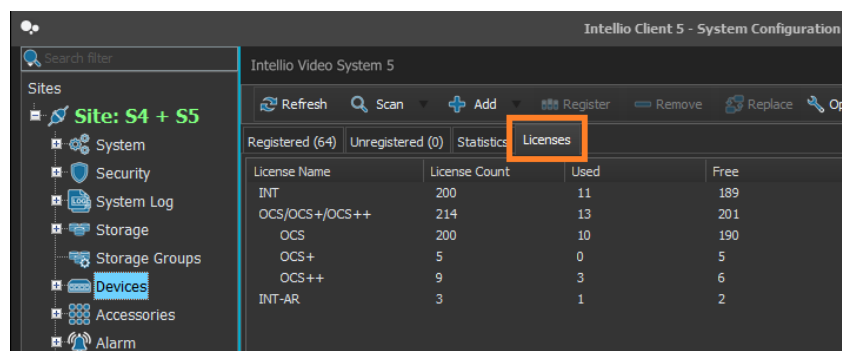
4. Manage devices, cameras

The checkmark next to a device name in the **System Configuration / Devices** menu indicates that the device is enabled, and the server is either maintaining or attempting to maintain a connection with it. If the connection is successful, the Status column will display Online. If the connection is unsuccessful, the Status column will show an ongoing connection attempt.



You can click the checkmark with the left mouse button to toggle the device between enabled and disabled states. Alternatively, you can right-click the device and select **Enable Device** or **Disable Device** from the pop-up menu.

If a device is disabled, the server does not maintain a connection with it, live footage cannot be displayed from the device, and no images are stored. However, previously recorded footage from the device can still be played back. In the disabled state, the device does not consume camera licenses, the quantity of which can be checked under the Devices menu / **Licenses** tab.



If the server continuously fails to connect to a device, the number of attempts will gradually decrease over time. If necessary, an immediate attempt can be forced using the **Force Connect** option in the pop-up menu.

The selected device can be replaced with another device registered with the same protocol using the **Replace With...** option in the pop-up menu or the **Replace** button in the top button bar. Before selecting this function, add the device you want to replace the selected device with to the **Unregistered Devices** list.

During device replacement, the device-side detectors are not transferred and will become inaccessible afterward, potentially displaying error messages if activated. This is because the

device-side detectors were assigned to the replaced device. Server-side detectors will continue to function without issues after the replacement.

5. Set audio inputs

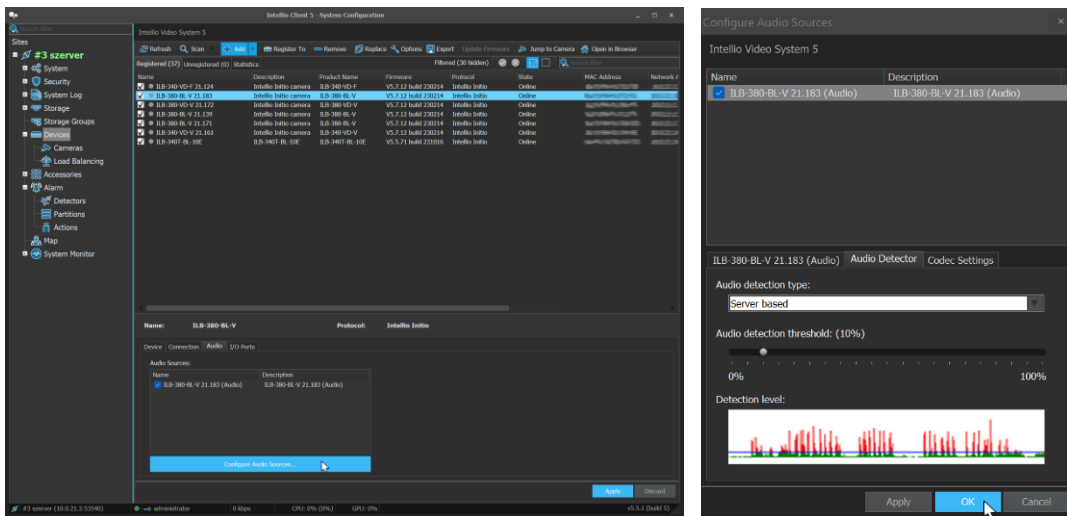
Audio inputs can be managed for both RTSP streams and RTSP audio devices. The supported audio formats are:

- G.711 PCM u-Law/A-Law (8000 Hz)
- G.726 ADPCM-16/24/32/40 Kbps (8000 Hz)
- AAC

The main audio input settings are found under the device's configuration: go to **System Configuration / Devices**, select the device, and click the **Audio** tab in the lower device settings panel. Here you will see the names and status of the audio inputs. To modify settings, click the **Configure Audio Inputs** button..

- The **Enabled** checkbox allows you to enable or disable the audio input. If an audio input is not in use, it is recommended to disable it so the system does not process it.
- **Name** and **Description**: assign a name and a more detailed description to the audio input.
- **Select Assigned Cameras...**: configure which cameras you want to associate with the audio channel for live view and playback. Multiple cameras can be selected, but by default, the audio is linked to its own camera. If no camera is selected, the audio channel will appear separately in the Audio Channels toolbar, where it can be toggled on/off and its volume adjusted.
- **Audio Detection** tab: Defines the type of audio detection used for recording.
 - **Disabled**: Audio is not recorded, but it can still be monitored in live view.
 - **Continuous**: Audio recording is continuous.
 - **Server Side**: Allows setting a detection threshold in percentage. The lower section of the window displays the currently detected audio level and the configured threshold value in real time.

- **Audio URL (RTSP stream only):** Select the RTSP URL used for the audio channel. In dual-streaming setups, it is recommended to use the same URL as the one used for video storage.



Audio is stored together with the video based on the settings defined in the **Storage Groups**.

User access to audio inputs can be controlled in the **Security** section, and just like with cameras, access can be configured individually for each audio input.

6. Open camera web interface

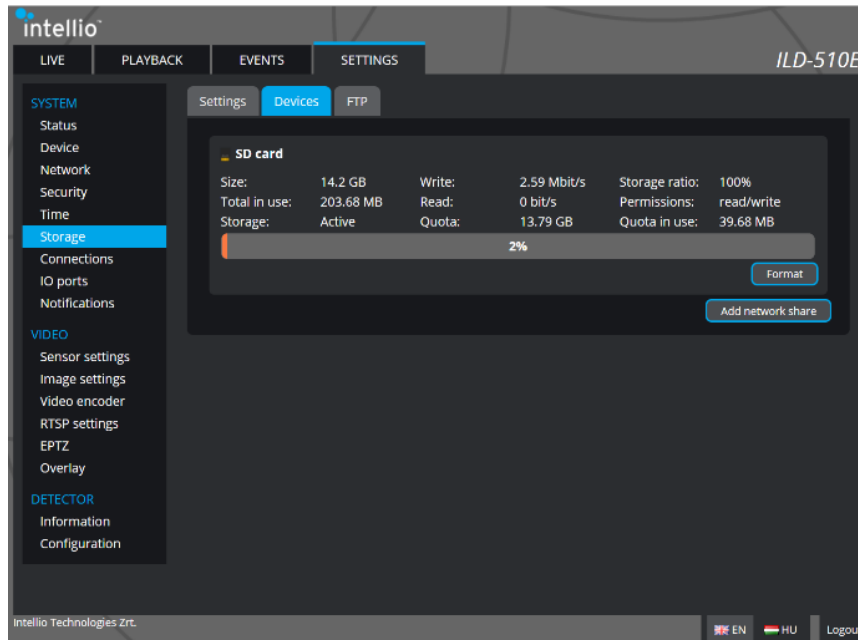
Most cameras have their own web-based configuration interface. This interface can be accessed directly from the IVS by pressing the **Open in Browser** button in the **System Configuration / Devices** menu. This button opens the camera's web interface in the default browser with a single click.

The camera's web interface is accessible only if the camera is reachable from the computer running the client program. It must be accessible from the client program running on the server, but it can be accessed from any location only if the appropriate network settings are in place.

7. Store footage on a memory card

In the Intellio Orio/Visus (ILD-xxx) camera families, the models equipped with a microSD card slot support local storage. Each such camera requires a microSD memory card (the larger, the better, but a minimum size of 8 GB is recommended), onto which data will also be stored locally. These recordings are always stored based on motion detection to save storage space.

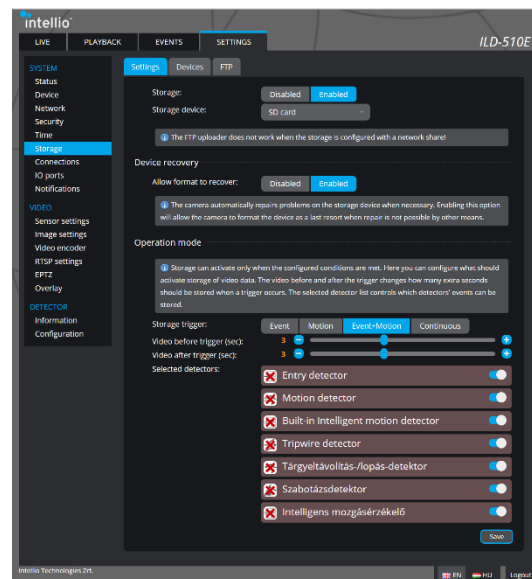
It is recommended to format the SD cards (local storage will work with factory-formatted SD cards as well, but data storage may be less reliable). To format the card, enter the IP address of the connected camera into a web browser, then go to the **Storage / Devices** tab and format the memory card from there.

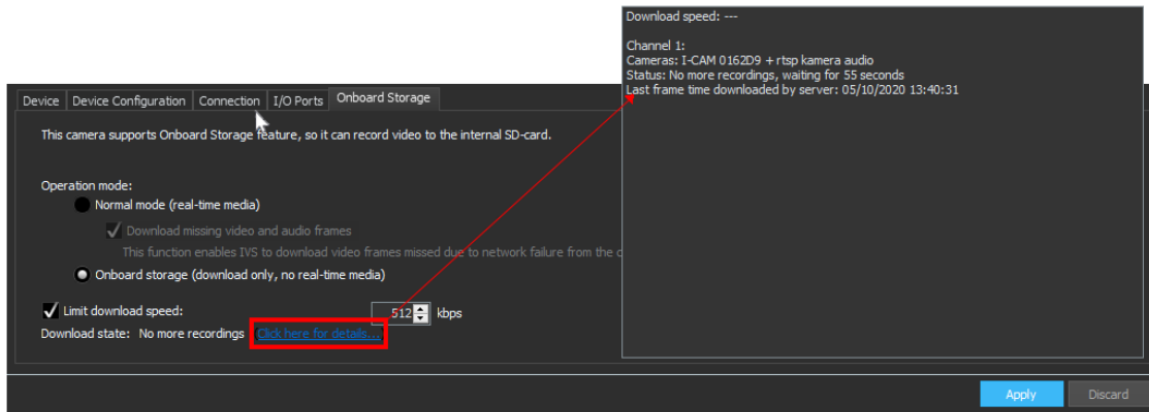


Enable storage on the **Storage** tab by selecting **SD card** from the dropdown menu, then click the **Apply changes** button and wait for the operation to complete.

After that, open the client software and go to **System Configuration / Devices**, then select the **Onboard Storage** tab of the enabled camera. The program will detect that the feature is enabled.

Download can be enabled from the client side, and you can also set the speed for downloading missed recordings afterward. This is useful if the network is heavily loaded and increased traffic could interfere with the system's normal operation.

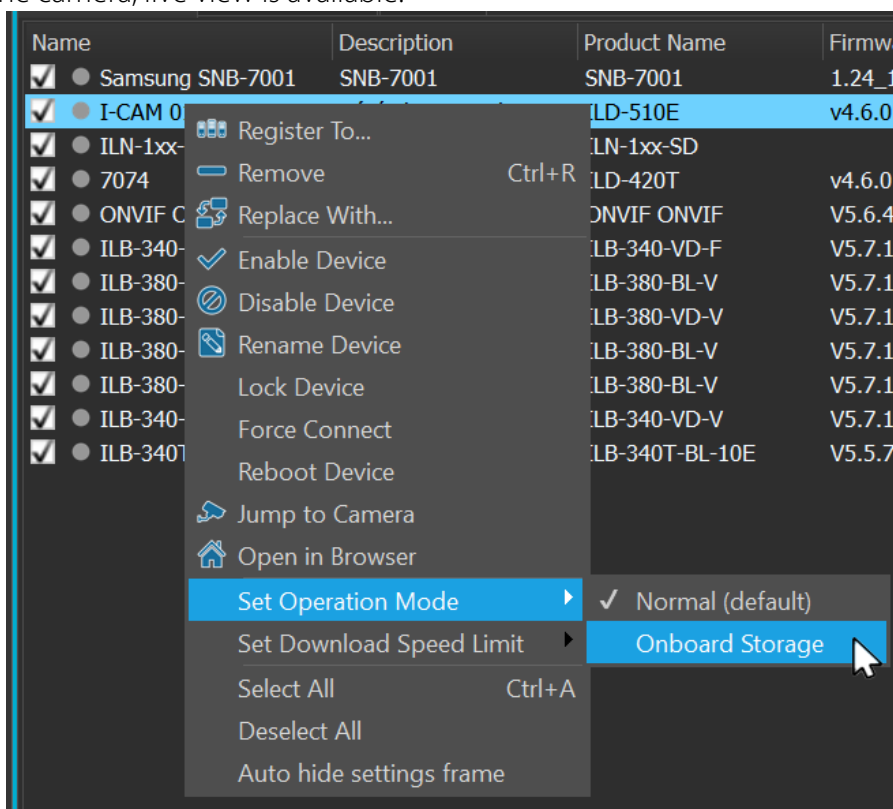




To change the storage mode, right-click on the desired device under **System Configuration / Devices**, then in the pop-up menu, go to the **Set operation mode** submenu and select the desired mode..

If the camera is not continuously accessible due to installation conditions (e.g., mounted on a vehicle), it is recommended to set it to **Onboard Storage** operating mode. For cameras set to local storage mode, live view is not available; recording is done solely on the camera’s SD card. Recorded footage is automatically downloaded once the camera’s connection is restored.

In **Normal** mode, downloading of missed recordings is limited only to footage after the server has started (any server restart may cause recording loss), but if a connection exists between the server and the camera, live view is available.



8. Intellio Orio/Visus camera firmware update

The firmware is the software running on Intellio cameras that ensures their operation. Occasionally, it may be necessary to update the camera firmware for new features or bug fixes. Firmware updates for Intellio Orio/Visus cameras can be performed directly from the IVS client application (recommended) or via the camera's own web interface.

Download the latest camera firmware from the intellio.eu website..

After downloading the firmware, follow these simple steps:

- Launch the Intellio Client program and connect to the SITE of the camera(s) to be updated.
- In System **Configuration / Devices**, select the cameras to be updated. The device status must be online and registered. To select multiple cameras, hold down the **Shift** or **Ctrl** keys (Shift allows selecting all devices between the first and last selected cameras automatically).
- Press the **Firmware Update** button, then locate and select the firmware file to upload.
- Verify that the selected cameras are among the supported devices for this firmware. If so, confirm the update. The firmware update usually takes 1–2 minutes per camera but can take up to half an hour in rare cases (some ORIO firmware versions).
- After a successful update, the camera will reboot and notify the success with a dialog window.

***Note:** If the camera fails to update firmware the first time, check that it is truly online, then repeat the steps above. Firmware updates can also be performed through the camera's web interface.*

9. Image settings

Outstanding image quality is essential in video surveillance. To achieve this quality, it is necessary to adjust the image settings to the requirement of the environment. The video adjustment can be reached by go to **System Configuration / Devices / Cameras**, select a camera then under **Video Adjustment** tab, click the button. These settings can be also reached from the live image, with the **Video Adjustment** button of the camera menu.

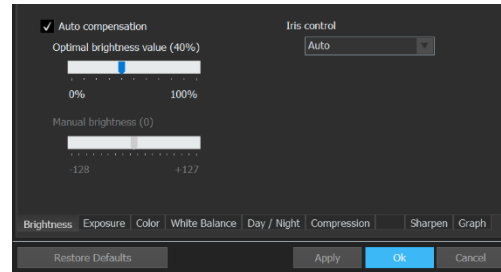
Since the layout of the ILD and the other kind of cameras is quite different from this version, we talk about them separately, although lots of the functions are basically the same in both types.

9.1. ILC and ILN series

9.1.1. Brightness

Auto Compensation: By default, this brightness option is enabled. The camera automatically calibrates the **Optimal brightness value** level.

Optimal brightness value: The system set default value can be altered if the image of the camera is insufficient.



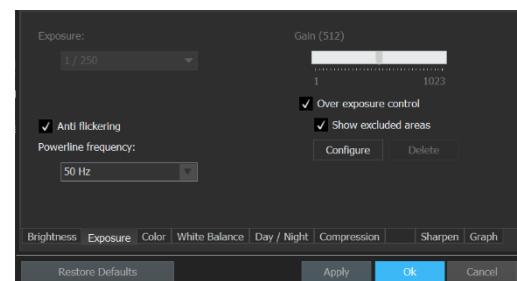
Manual brightness: To set the brightness level manually, disable the checkbox of **Auto compensation** and set it in the scale.

Iris Control: In **Auto** mode the iris is controlled automatically by the camera. In **Open**, or **Always Open** mode the iris is opened manually. Use this function when you are calibrating the sharpness of the camera.

*Note: If **Auto compensation** is enabled it is not allowed to set exposure or gain values manually (**Exposure** tab).*

9.1.2. Exposure

Anti-flickering: This function can be useful in an artificially illuminated environment, where the frequency of the light can be sensed through the cameras. By enabling it, this problem will be ceased to exist. Set the drop-down list to the proper voltage standard (can be find on the internet).



Over exposure control: If this option is enabled, the software will try to optimize the lighting conditions excluding the laid-out areas (**Show excluded areas** /**Configure**, use mouse to set the border of the excluded part of the image).

Gain: With the help of this slide bar the brightness of the image can be altered. Mind during the settings that although the high value can brighten the image considerably, the noisier it will become. If the **Auto compensation** is enabled, this option is unavailable.

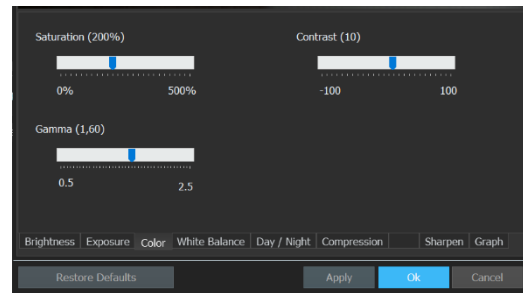
Exposure: It sets the amount of light the sensor gets. The defined possible values are the shutter speed times. The faster the exposure is, the darker the image gets, but the moving objects became more defined. These settings accessible only if the **Auto compensation** is disabled.

9.1.3. Colour

Saturation: It allows the changing of the colour richness.

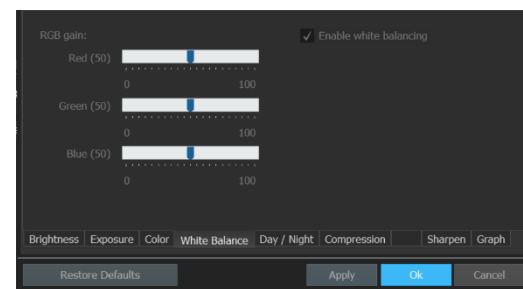
Gamma: Accentuates details in low contrast areas without affecting shadows or highlights.

Contrast: Increase or decrease the contrast of colours. At high values the contrast will be sharper, but the image gets darker.



9.1.4. White Balance

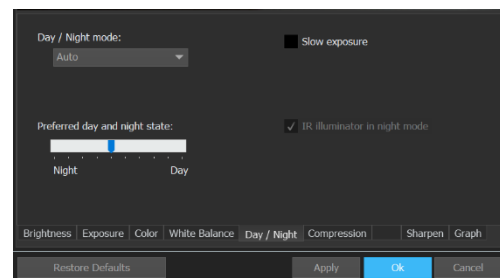
This function can be found exclusively in the ILC devices. It adjusts white balance to get the colours of your images as accurate as possible. If the **Auto compensation** is set, the white balance cannot be set. To use manual white balancing, disable **Enable white balancing**.



9.1.5. Day / Night

Day/Night mode: It sets the basic attribute of the camera (only camera series ending with a 10 has a physical IR filter e.g. ILC-110, ILC-210).

- By selecting **Day** mode, the IR filter is in front of the image sensor.
- By selecting **Night** mode, the IR filter will be removed from the image sensor engaging higher sensitivity within low light circumstances and the capability to see within the range of infra light.
- By selecting **Auto** mode, the camera will automatically adapt to the light conditions by controlling the IR filter automatically.



Day/Night threshold: The lower this value, the lower is the threshold when the camera switches to night mode, which means the camera switches to night mode even if the lighting condition is less dark.

Slow exposure: By enabling this checkbox the camera is allowed to set the exposure to 1/6 automatically if the lighting conditions are too low.

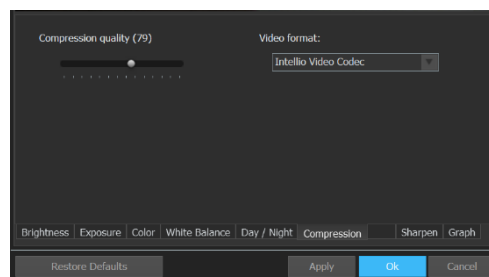
IR illuminator in night mode: It set whether the infra illuminator will switch on at night, or not.

9.1.6. Compression

Video format: Intellio is using two kinds of compression methods for image transmitting:

- **Intellio MJPEG:** This compression method produces JPEG-quality images. Each frame is compressed individually, meaning frames can be discarded if not needed. Intellio MJPEG offers additional features such as multi-layer support and low-resolution decompression.
- **Intellio Video:** This compression method is specifically designed for fixed cameras, as it compresses only the changes in image content. It efficiently uses available bandwidth and storage capacity. The required bandwidth is similar to that of H.264 compression, but its key advantage is that significantly less processing power is needed to decompress the images..

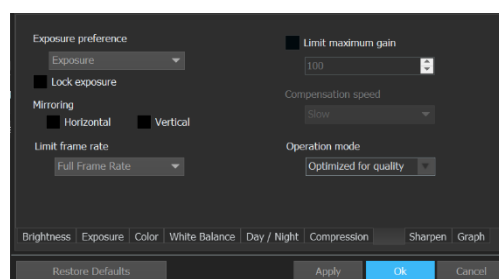
Compression quality: Sets the level of image compression. Higher compression quality results in better image quality, but also larger file sizes.



9.1.7. Advanced

Exposure preference: Noisy or blurred images operating under low light conditions have always been an issue in video surveillance. Now you have the option to choose the image to be less noisy against blurred or less blurred against noisy.

- Selecting **Gain** the moving objects in the video will not be blurred.
- Selecting **Exposure**, the quality of video will be less noisy, but could be blurred.



Lock exposure: By enabling it, the exposure will be set to a predefined value. This value is different for each option of the **Exposure preference**. Depending on these settings the exposure will be 1/100 in **Exposure** mode or 1/400 in **Gain** mode.

Limit maximum gain: An upper limit can be set to the gain.

Compensation speed: This function available only if the iris is manually controlled. If the iris is set to **Auto (Brightness/Iris control)**, the compensation speed is slow by default.

Intelligent functions' reliability is better if the video content analysing can run in constant light conditions because the background doesn't change all the time. The **Compensation speed** function is able to automatically adjust the video adjustments thus the background changes without disturbing the real time video analytics. It can be said that the fast compensation speed will react to fast, temporary changes on the lighting condition, such as car reflectors at night.

- By selecting **Slow** the background changes as slowly as it doesn't affect to real time analytics.
- By selecting **Fast**, the camera adapts to the lighting conditions the fastest way. This option is useful only if there is no intelligence used in these cameras.

Operation mode (ILC-1xx cameras)

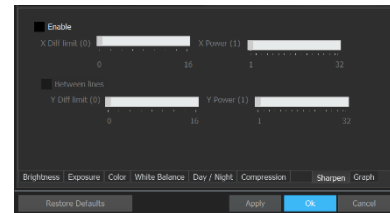
- By selecting **Optimized for quality** the camera will send better quality images but fewer frames.
- By selecting **Optimized for speed** the camera will send more frames but worse quality images.

Limit frame rate: Set an upper limit on how many images will be sent to the server.

9.1.8. Sharpen

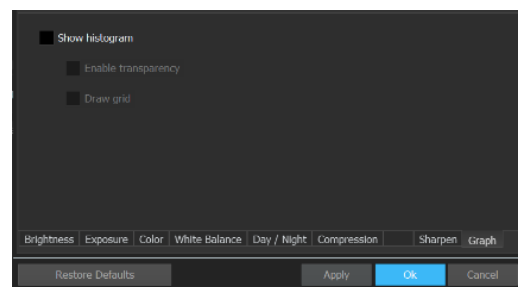
Sharpening only affects the image displayed by the client; it does not impact the recorded footage.

- **Power:** It sets how strong the sharpness of the edges is displayed.
- **Threshold:** Basically this is the noise filter, it filters out the non-edge contour lines (*and the edges too, if set too high*).



9.1.9. Graph

If enabled, a histogram will show up on the upper left side of the image, displaying the day/night mode, the exposure and the gain values, and on the histogram shows the brightness of the pixels.



9.2. ILD-series

9.2.1. Day and Night Profile

The Day and the Night profile basically the same. The difference is that the camera can use different settings during night mode, than during the day. To enable this, check the Night profile tab, and make sure to enable the night profile (**Enable night profile** checkbox). The rules of the day and the night mode can be found in the **Day / Night Profile** tab of the **General** page.

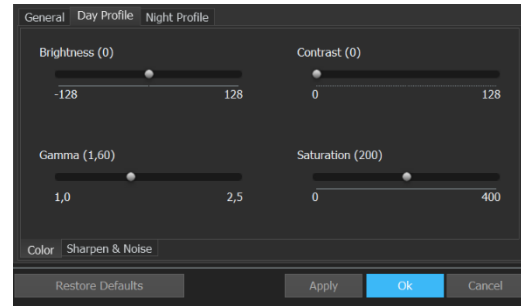
9.2.1.1. Colour

Brightness: Increase or decrease the overall brightness of the image.

Contrast: Increase or decrease the contrast of colours. At high values the contrast will be sharper, but the image gets darker.

Gamma: Accentuates details in low contrast areas without affecting shadows or highlights.

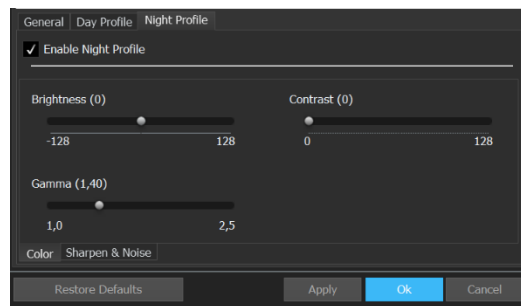
Saturation: It allows the changing of the richness of colours (only for **Day Profile**).



9.2.1.2. Sharpen & Noise

Sharpness: It sets the sharpness of the displayed image.

Noise filter: Sets the strength of the filter, which means the higher this value is, the image will be less noisy, but more blurred.



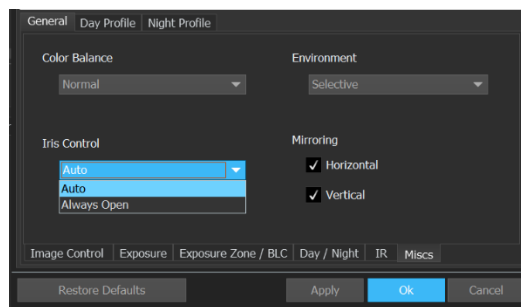
9.2.2. General

9.2.2.1. Iris

Iris Control: There are two possible modes—either automatic adjustment or fully open.

When adjusting the camera's focus, always use the open iris setting.

For ORIO cameras, iris control has its own separate tab.

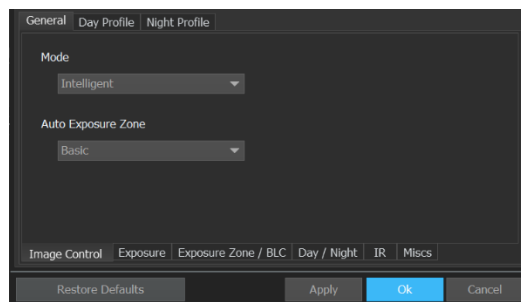


9.2.2.2. Image control

The settings are available only for VISUS cameras.

Mode: Standard or Intelligent mode. In Intelligent mode, the camera will use the tracker information to control the image properties.

Auto Exposure Zone: Basic and Tracker options are available. When the Tracker option is selected, the camera will use the tracker information to continuously change the exposure zone.



9.2.2.3. Exposure

Max Exposure: Defines the maximum shutter speed, so it cannot be slower than the set value. Although if the shutter time is set low, the images will be brighter, but the fast movements will not be seen clearly in any images.

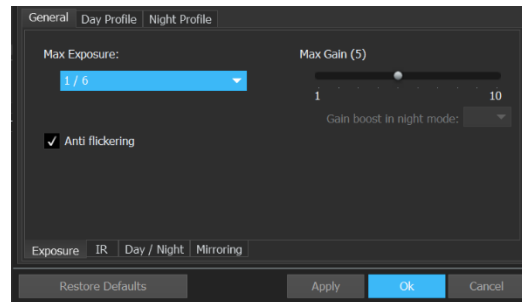
Max Gain: Sets the maximum of the gain value. If the gain is high, the image will be brighter, although noisy.

The following section outlines the key differences between the ORIO and the VISUS models.

ORIO

Gain boost in night mode: Gain can be boosted in nighttime mode, although this will also cause the images to be noisier.

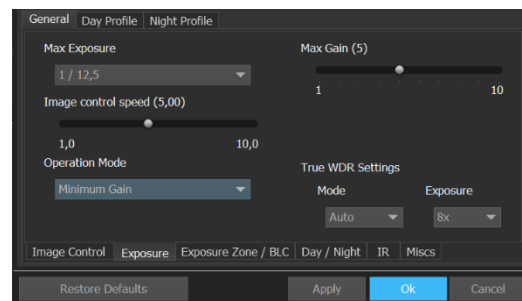
Anti flickering: This function can be useful in an artificially illuminated environment, where the frequency of the light can be sensed through the cameras. By enabling it, this problem will be ceased to exist. Set the drop-down list to the appropriate voltage standard (can be find in the internet, for example here: https://en.wikipedia.org/wiki/Mains_electricity_by_country).



VISUS

Operation Mode: This option allows for specifying the mode of operation of the camera, which will be used automatically later on (minimum exposure, minimum gain and anti-flickering).

Software WDR Settings: Adjusts the "wide dynamic range" function. With the WDR on, the camera makes two images with differing exposure times (a short and a long one) and finally merges the two. The resulting image will be of optimum exposure in every part of the image. The multiplier next to the exposure value refers to the value by which the shorter exposure time will be multiplied to yield the longer exposure time.

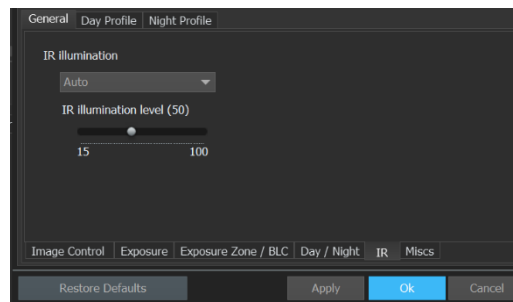


In automatic mode the camera will employ the same multiplier. In anti-flickering mode the camera will set the exposure to a value of integer multiples of the frequency value.

9.2.2.4. IR

IR Illumination: Sets whether the camera turns the IR LEDs on or off. When **Enabled**, the IR LEDs remain on continuously. When **Disabled**, they stay off - even at night.

In **Automatic** mode, the IR LEDs operate according to the **Day/Night mode settings**: they turn on in night mode and off in day mode.



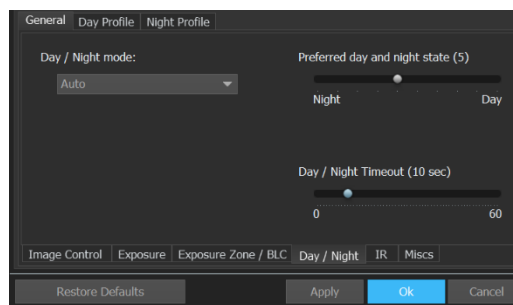
The strength of the IR illumination can also be adjusted using the slider below.

This setting is only available for cameras equipped with IR LEDs.

9.2.2.5. Day / Night

ay/Night mode: It sets the basic attribute of the camera.

- By selecting **Day** mode, the IR filter is in front of the image sensor.
- By selecting **Night** mode, the IR filter will be removed from the image sensor engaging higher sensitivity within low light circumstances and the capability to see within the range of infra light.
- By selecting **Auto** mode, the camera will automatically adapt to the light conditions by controlling the IR filter automatically.



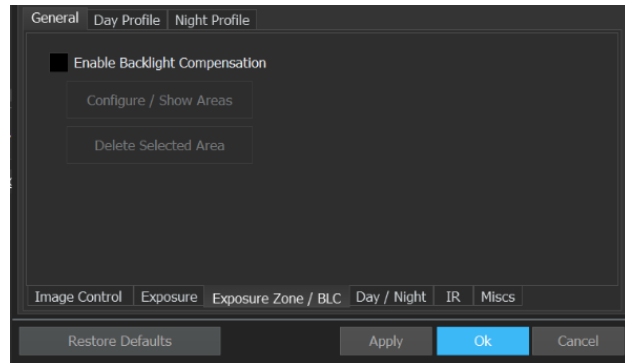
Preferred day and night state: Determines under what lighting conditions the camera switches between day and night mode. The lower the value, the sooner the camera switches to night mode - even if lighting conditions don't necessarily require it.

Day/Night Timeout: The amount of time the camera waits before switching modes. This delay helps prevent rapid switching caused by minor fluctuations in lighting conditions.

9.2.2.6. Backlight Compensation or BLC (for older cameras OEC)

This feature allows you to optimize lighting conditions in specific areas of the image. It is ideal when part of the scene viewed by the camera is bright and another part is dark.

For ORIO cameras, the configured area is ignored during lighting optimization. For VISUS cameras, when the feature is enabled, lighting optimization is performed only based on the image content within the selected areas.



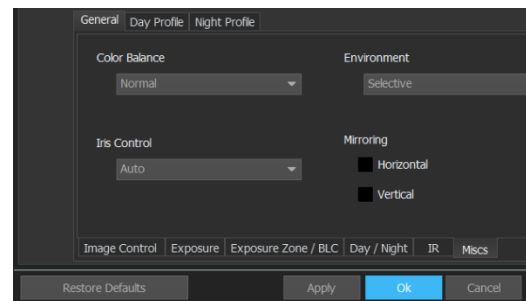
9.2.2.7. Misc

Balance: There are seven settings options with various colour modes to select from here. These settings are not client sided and affect the recorded images as well.

Environment: **Indoor** / **Outdoor** options are available.

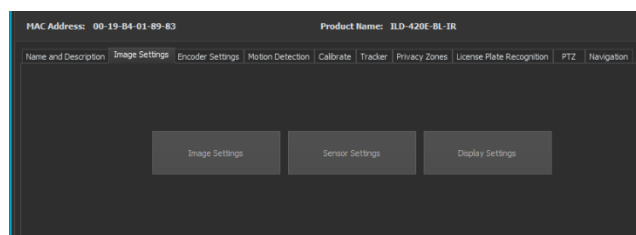
Iris Control: In **Auto** mode the iris is controlled automatically by the camera. In **Always open** mode the iris is fully opened. Use this function when you are calibrating the sharpness of the camera.

Mirroring: The displayed image can be mirrored horizontally and vertically. To set the mirroring axis, check in the proper checkbox next to the mirroring direction.



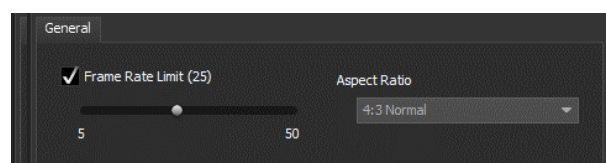
10. Sensor settings

These settings are only available with the VISUS camera series. Similarly, to the video settings, the settings interface can be accessed from the **Image Settings** tab.



After clicking the button, these values can be set on the popup window:

- **Frame Rate Limit:** The highest frame rate that the camera supports; it will not be exceeded even if the camera is capable of higher frame rates. Switched off by default.
- **Aspect Ratio:** The ratio of images transmitted by the camera.



11. Display Settings

This feature allows for the rotation of images produced by ORIO and VISUS cameras. When using this feature, the only detector running will be the onboard motion detector. Hence, you will either have to do without the other detectors or modify the camera position.

12. Encoder settings

This chapter discusses the modification of the resolution of the images transmitted by the camera, the compression of the images, the custom settings of the various compression methods and the framerate settings.

12.1. ORIO cameras

The ORIO cameras' many configuring options are located in the **System Configuration / Devices / Cameras** menu. Just select an ORIO camera and the **Encoder Settings** tab will appear. The **Encoder Settings** window can also be reached through the camera menu, in the **Live** function. This is an extremely important part of the camera configuration, considering that several related functions are placed here.

12.1.1. General

- **Codec:** The used codec type can be selected (H264, Intellio Video Codec or MJPEG). Depending on the codec the bandwidth limit, the quality of the images, the I frame distance and other things can be modified.
- **Resolution:** Every ORIO camera, except the 100 series support three different kind of resolution. The smaller resolution means better fps, but worse image quality.
- Other settings peculiar to the compression method chosen.

12.1.2. Frame Rate Control

- **Reduced frame rate control:** Here can be set the trigger event of the reduced frame rate. The camera will turn on the high frame rate only if the selected event happens.
- **Target frame rate on event or motion:** If the defined event in the **Reduced frame rate control** happens, this is the frame rate the camera sends the images on.
 - **Basis of the reduced frame rate:** This can be an **alarm**, a **motion** or **both**. If it is set to motion, the camera will only increase the framerate if it senses movement. If it is set to alarm, the framerate will only change is there is an alarm event.
 - **Target frame rate if no event:** There may be cases where you want to record or monitor even when there is no motion. From the dropdown menu, you can select a desired time interval to define how often the system should send images for storage and monitorings.

12.1.3. Pre- / post alarm

This feature is only supported with the Intellio Video Codec. When enabled, the camera stores a few seconds of footage in its internal memory. In the event of an alarm trigger, these pre-event images are sent to the server for storage, allowing you to view the few seconds before the event - even when using motion-based recording. The post-alarm function sends a specified number of frames after the event ends.

This feature is independent of the similarly named function found in the camera's assigned storage group (see *Storage settings* documentation).

12.2. VISUS cameras

12.2.1. General

- **Codec:** H.264 is the exclusive compression method of the camera.
- **I frame distance:** The distance between key frames. The smaller this value, the smoother the frame rate lowering settings work, but increases the network demand.
- **Resolution:** The resolution of the image with the given compression method
- **Target Bitrate:** The approximate compression value of the video transmitted by the camera. The higher the value, the higher the image quality, but also the larger the network demand.

12.2.2. Frame Rate Control

The enabling and disabling of the functions on the tab can be done using a single check box. If the frame rate control functions are disabled, the highest possible frame rate will be provided by the camera.

- **Reduced frame rate control:** The type of events can be set here that trigger the higher frame rate mode.
- **Target frame rate on event or motion:** If one of the conditions set under **Reduced frame rate control** is met, the images will be transmitted at the frame rate set here.
- **Target frame rate if no event:** If there is no predefined control state (such as alarm and/or motion), the camera operates at this frame rate.

12.2.3. Pre- és post-alarm

In VISUS, this feature also works with the H.264 codec. See the **Pre- - Post alarm** section under previous-generation ORIO cameras for more details.

12.2.4. Secondary Encoder Settings

It shares all the settings of the Primary encoder settings. The only difference is that the secondary encoder settings is set to low resolution as a factory default.

13. Grouped camera settings

For Intellio ORIO, VISUS cameras, there is an option to configure video image and encoder parameters in groups. By using the group setting, you can adjust the parameters of multiple cameras of the same type in one step, saving significant time and ensuring that the settings are consistent.

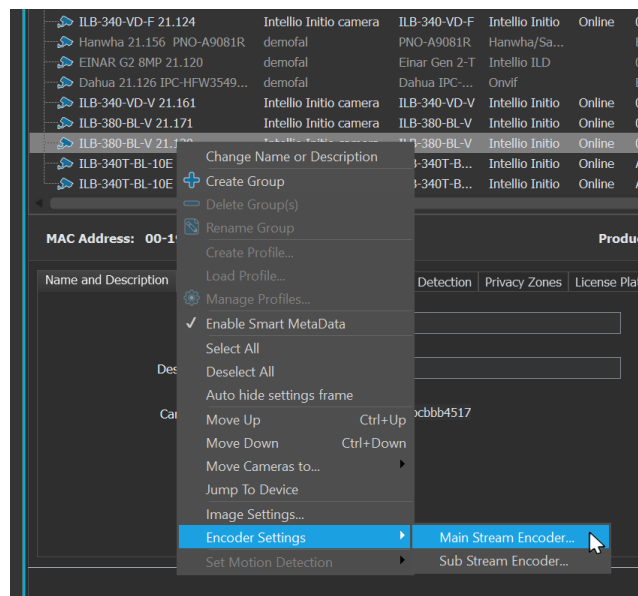
To use group settings, select the cameras you wish to configure from the **System Configuration / Devices / Cameras** page. To select multiple cameras, use the **Ctrl** or **Shift** keys while selecting. Holding the **Ctrl** key allows you to select individual cameras one by one, while holding the **Shift** key will select all cameras between the selected ones.

Right-click on the list of selected cameras, and in the menu that appears, choose the function you wish to modify.

Group settings can be applied to the following parameters:

- **Image settings...**
- **Encoder settings**
 - **Main stream encoder**
 - **Sub stream encoder**

When modifying, the familiar setting windows for the respective parameters will appear. The modified data will be displayed in highlighted text, allowing changes to be tracked. When the changes are accepted, only the modified data will be validated for each camera.



14. Motion sensor

14.1. ILD motion sensor

The built-in motion detectors in the camera control the transmission of images to the server. The camera includes two separate motion detectors—one for monitoring and one for recording.

If a monitoring motion detector detects motion, the images are displayed on the client's live view interface but are not stored.

If a recording motion detector detects motion, the transmitted images are stored, but do not appear on the live view.

If both types of motion detectors detect motion, then the incoming images will be both displayed on the live view and stored.

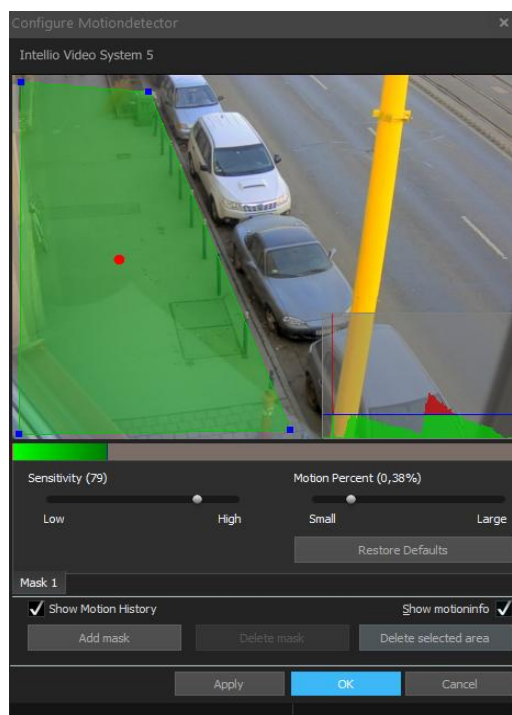
14.1.1. Calibrate motion sensor

Configuring the motion sensors can be done from **System Configuration / Devices / Cameras** menu. Choose a camera, then select the **Motion Detection** tab with two buttons inside. Select either the **Configure Motion Detector for Monitoring** or **Configure Motion Detector for Recording** buttons. One of them forwards the images for live viewing, the other oversee the images sent for recording. These functions can be accessed from the live view through the camera menu from the **Motion Detector / Monitoring**, or **Motion detector / Recording** menupoints.

In the appearing window set the area in which the sensors will be operating. Several polygons can be created in one mask; also, there can be more than one mask with different settings.

- The **Sensitivity** defines how low the threshold limit of small changes is in the background the value. On small values, a man walking in a similar shade as a wall could be undetected. On high values this never happens, but signals on small light changes.
- The **Motion Percent** defines a percent of the selected area, where if there is a change between the image, it is considered alerted. On small values, little moving objects and even small light changes could be detected as motion. On high values, too small objects might get filtered out.

Create as many masks as necessary. By creating several masks, different sensitivity and size values can be set.



14.2. Motion sensor settings for RTSP and MJPEG videostreaming

The following settings are available:

- **For I-frames only (fast but less reliable):** Server-side motion detection runs only on I-frames (key frames), which requires significantly less processing power.

Important: *Intelligent Motion Detection and Event Browser will not work with this setting!*

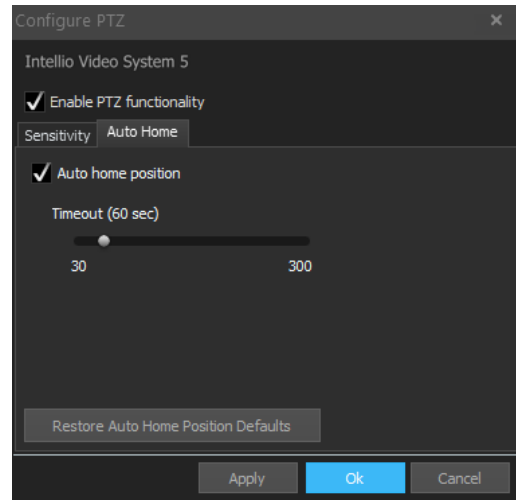
- **For all frames (reliable but slower):** Motion detection analyzes every frame, regardless of whether it's a key frame.

Important: *This method is the most CPU-intensive, but all client features are fully supported!*

- **Continuous motion:** The system treats the camera as if motion is constantly present—so with motion-based recording, every frame is stored.
- **Disabled:** The system will never detect motion from the camera. In motion-based recording mode, no images will be stored, only live view will be available..

15. EPTZ and PTZ

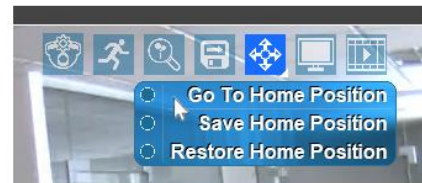
In the **System Configuration / Devices / Cameras** menu, in the **PTZ** tab of a camera there is a **Configure PTZ** button. The help of the opening window the EPTZ function and its **Auto home position** time can be authorized or forbidden. The EPTZ will log out of the function automatically after the timeout limit is reached, if the auto home position is authorized. If the EPTZ function is in use and not just authorized, the detectors will cease operation for that period, and the displaying of masks is suspended for the duration of this function.



On the VISUS cameras the Home Position can be set, which means its default state. If this is an EPTZ position, the camera will always revert to this position.

The movement speed of the EPTZ can be adjusted on the **Sensitivity** tab.

In case of cameras that are able to use motorized Zoom and Focus, these functions can be adjusted from the PTZ panel of the live view. The focus and zoom settings can be adjusted provided that the PTZ function is switched on and the camera is displayed on the active panel.



16. Privacy zones

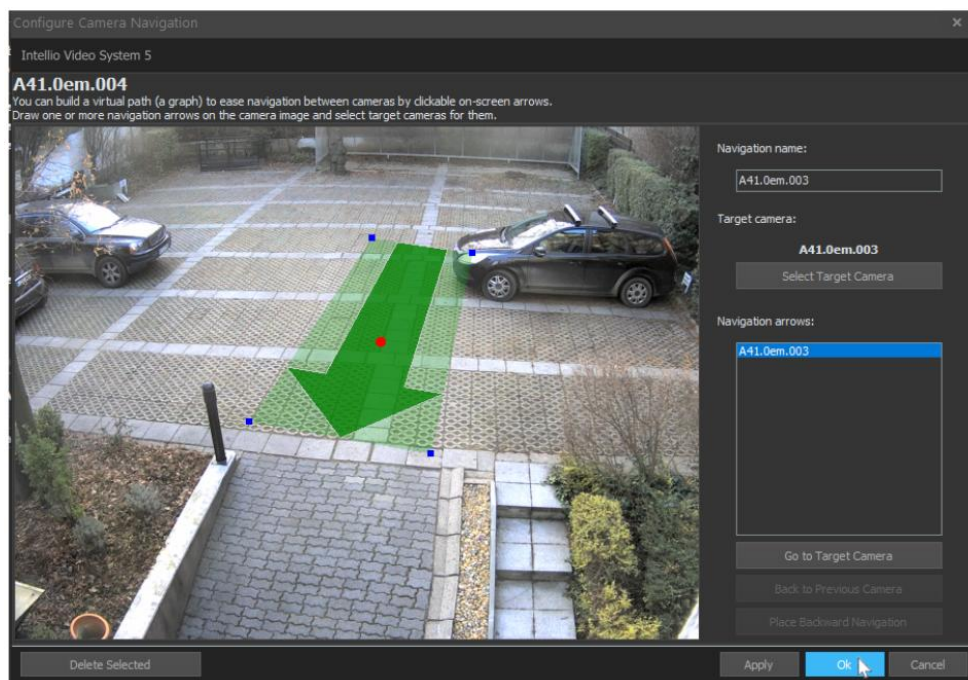
By using privacy mask, a part of the image can be hiding from some users. Those users who have specified rights can see behind the privacy zones. To create privacy zones, do the following: **System Configuration / Devices / Cameras / Privacy Zones** tab **Configure Privacy Zones** button. Start draw masks then click **Apply**.



When properly restricted - for example, when logged in as an **Operator** user - by default, activity behind the masks is not visible..

17. Camera navigation

With this feature you can set up clickable on-screen arrows with the help of which it is possible to efficiently navigate between the cameras. The camera navigation is camera independent, so it can be used with any kind of camera. To set the camera navigation, select the desired camera on the **System Configuration / Devices / Cameras** page, then select the **Navigation** tab, and press the **Configure Navigation** button.



The live view of the selected camera will be displayed in the **Configure Camera Navigation** window. The arrows which have already been configured will also be displayed. The camera title will be visible in the upper portion of the window. On the right side, you will find the controls which can be used to configure navigation.

Edit navigation arrows

To select an arrow, simply click with the left mouse button on the arrow or select it from the **Navigation arrows** list. The arrow that is selected will have a red dot in the middle.

To draw a new arrow, move the mouse to the point where you would like the arrow to begin and press the left mouse button. Next, move the mouse in the desired direction while holding down the left mouse button. When you reach the desired end point, release the left mouse button. The newly created arrow will be automatically selected.

The size of the selected arrow can be modified. To do so, simply drag an edge or a corner of the bounding area of the arrow with left mouse button. To change the whole position of the arrow, drag the bounding area with the left mouse button and move it to the new position.

Navigation name

The caption of the navigation can be changed in the **Navigation name** field. This caption will be displayed in the live view if the mouse hovers over the arrow (this can be enabled and disabled from the camera menu). If you leave this field empty, the default name will be the name of the target camera.

Target camera

The target camera is the camera which will be displayed when you click on an arrow. To change the selected camera, click on the **Select Target Camera** button and select the desired camera in the **Select Camera Dialog** window and press **Ok**.

Navigation arrows

To ease identification and selection, all arrows placed on the camera image are visible in the **Navigation arrows** list.

Go to Target Camera

By clicking on the **Go to Target Camera** button, you can jump directly to the target camera of the selected arrow. This feature is useful if you would like to build a path from the selected camera.

Back to Previous Camera

If the visible camera image is displayed as a result of the **Go to Target Camera** navigation, by clicking on the **Back to Previous Camera** button, you can jump back to the previous camera.

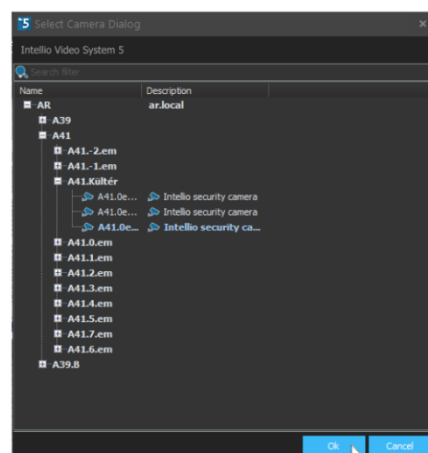
Place Backward Navigation

If the visible camera image is displayed as a result of the **Go to Target Camera** navigation, by clicking on the **Place Backward Navigation** button, you can create a new arrow to the camera from where the navigation has happened. The name and the target camera of this kind of arrow will be set automatically, but they can be changed later. The button is disabled, if an arrow already exists to the previous camera, or if there is no previous camera.

Delete Selected

To delete a selected navigation arrow, use the **Delete Selected** button.

Note: the PTZ camera control takes precedence over the camera navigation. If the arrows are placed in the PTZ control circle, they will not work. If you would like to place a navigation arrow on a PTZ camera, put it outside of the PTZ control circle.



18. Camera groups

The cameras can be organized into groups based on certain characteristics, greatly facilitating their overview; for example, cameras located on different levels can be placed in separate groups. To create a group, press the **Create Group** button in the **System Configuration / Devices / Cameras** menu, then enter the name of the new group.

Cameras within the groups can be freely moved by right-clicking on the selected camera, selecting the **Move Cameras to...** option from the pop up panel, and then choosing the target group where you want to move the camera. To change the order of cameras within a group, use the two options above the **Move Cameras to...** button (**Move Up, Move Down**).

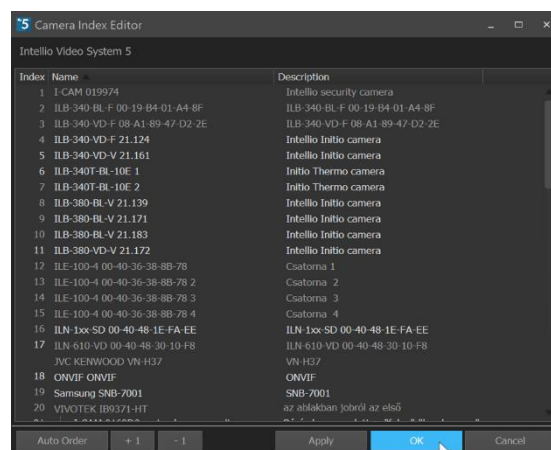
The groups themselves can also be sorted. Right-click on the group name, then use the options in the menu that appears to rearrange the order of the groups, or even create subgroups that can be sorted separately. It is also possible to grab the group with the mouse and drag it to the desired location.

To delete a group, first move all the cameras within it to another group, then select the group name, right-click, and choose the appropriate option from the menu.

19. Edit camera index list

In the **Camera Index Editor** window, you can assign a number to each camera. During live display, entering the index number allows you to view the camera's video stream. This method is faster than dragging the camera with the mouse from the left panel. More information about using index numbers can be found in the *User Guide*.

The Camera Index Editor can be opened by pressing the **Edit Index List** button in the **System Configuration / Devices / Cameras** menu.



The easiest way to assign index values is to use the **Auto Order** button. This automatically assigns a number to each camera in increasing order, overriding previous settings. The order can be changed by clicking on the camera's index, then editing it to the desired number. You can also use the **+1** and **-1** buttons to increase or decrease the index value by one. The client program prevents two cameras from having the same index value. If this happens, the names of the problematic cameras will be highlighted.

20. Camera-side, intelligent device detectors

This section covers the onboard detector settings for Intellio Orio, Visus (ILD) cameras only. To gain a comprehensive understanding of the entire IVS alarm system, refer to the ***System detectors and the IVS alarm system*** documentation.

Camera-side detectors described in the following sections must be created **through the IVS system**. Based on the settings, when a detector triggers an event, the event is logged in the Event Log, the Client software can play an alert sound, display camera feeds, etc., according to the parameters set in the Detector configuration window shown in this section.

If additional actions are required (e.g., moving to a PTZ preset, sending an email), you must not only add the detector but also configure the **entire alarm system** by creating Partitions and Actions (see ***System detectors and the IVS alarm system*** documentation)

The following detectors are available in Intellio Orio and Visus (ILD) cameras:

Standard onboard detectors:

- [Motion](#)
- [Sabotage](#)
- [Object removal / Theft](#)
- [Covering](#)
- [Rotation](#)
- [IO input](#)
- [Built-in ANPR detector](#)

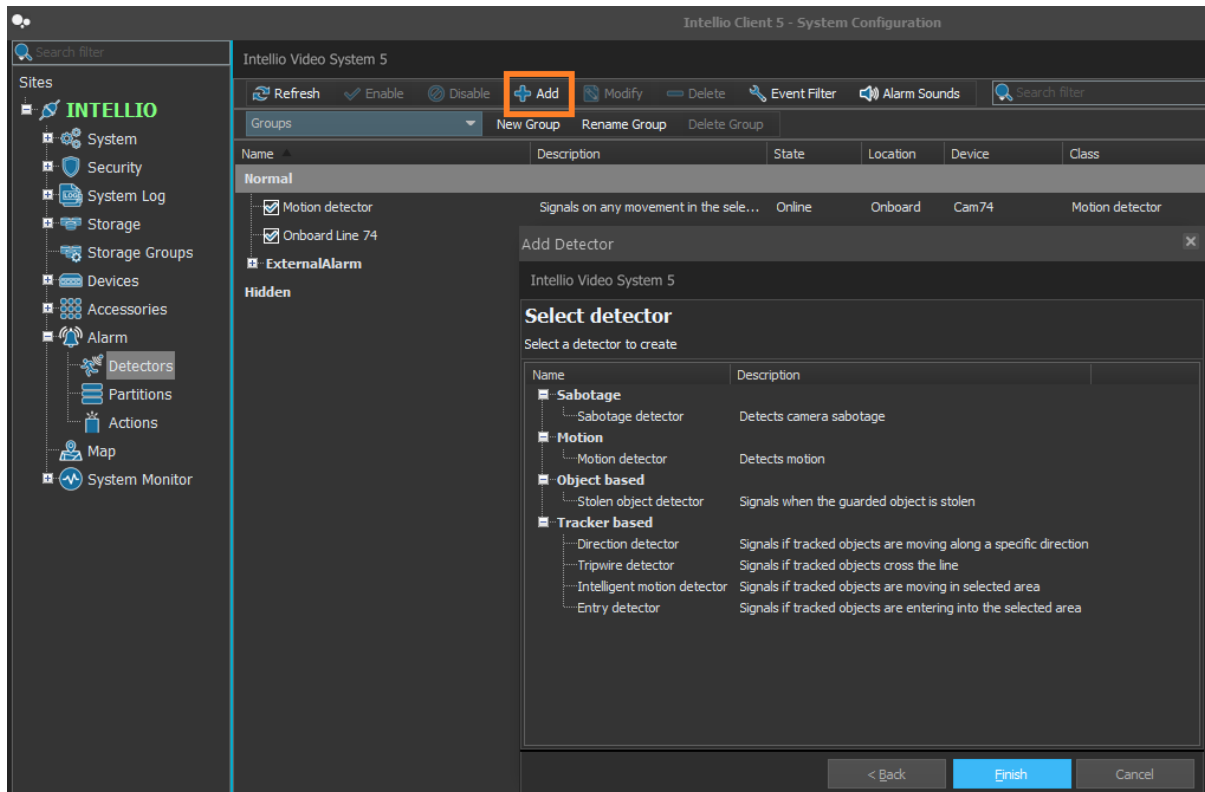
Tracker-based onboard detectors:

- [Entry](#)
- [Tripwire](#)
- [Direction](#)
- [Intelligent motion detector](#)
- [Hidden, built-in motion detector](#)

20.1. Add a detector

Detector settings can be accessed through the Client software. The process for modifying and adding detectors is the same after selecting the appropriate detector-camera pair.

- Click the **Add** button in **System Configuration / Alarm / Detectors** and select the **Onboard detector** type.
- Choose the camera where you want to configure the detector, then select the detector type from the list.



20.2. Common features of detectors

The detectors are highly similar because the main function of each detector is to alert for a specific pre-defined event. Therefore, many steps during setup are the same. The steps are listed below to provide a better understanding and overview of the detectors.

20.2.1. General structure of a detector

Each detector includes configuration settings across the following five tabs:

20.2.1.1. General

The detector's **name** and **description** are general by default, so it's recommended to change them for easier identification later (including the associated camera in the name or description can be helpful). Below the name and description, you can **enable** the detector and specify whether the **Intelligent Live View** function should consider it.

Priority controls how events from the detector appear in Spot panels in Live View; higher-priority events will override lower-priority ones.

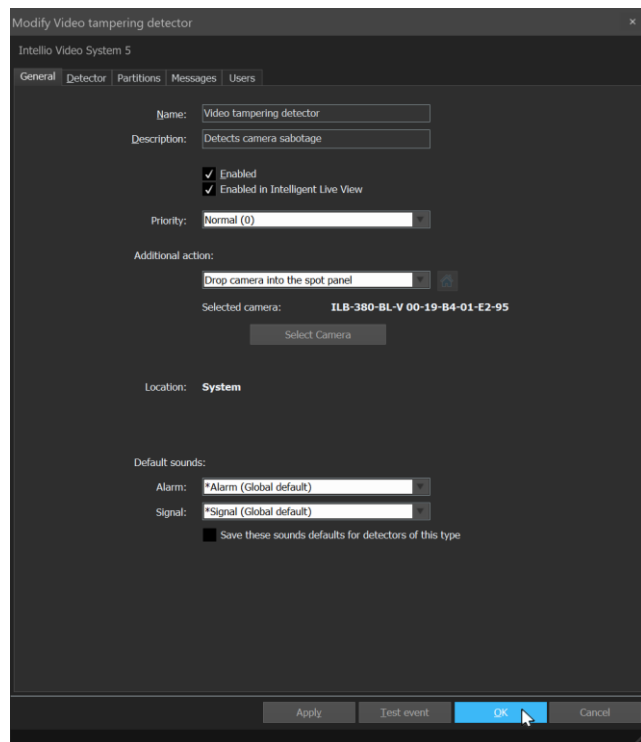
Additional action allow you to display even a different camera's feed instead of the default one when an event is triggered. This is useful if a sensor is connected to a camera's I/O input, but monitors a different camera's field of view. You can also configure complete view changes, displaying multiple cameras simultaneously when the detector triggers an event.

You can assign a custom sound to the detector's events.

If it is not necessary for each event to have a separate sound, you can simply set the **Default Sounds** for the detector. These will be the default sounds for detector events: **Alarm** for alarm events, and **Signal** for signal events.

If you want these default sounds to apply to all detectors of this type, check the **Save these sounds defaults for detectors of this type** checkbox. You can also provide your own custom sound file by selecting **Add...** from the dropdown menu at the bottom. The selected sound file will be uploaded by the client to the SITE servers, from where other clients will download it upon their first login (see the **Media Library** section in the *System detectors and the IVS alarm system*).

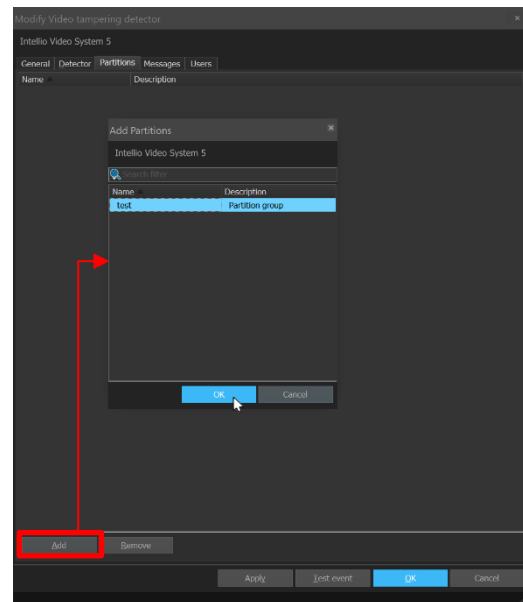
If you want each event to have a different sound, you can set the sounds for each event on the [Messages](#) tab.



20.2.1.2. Partitions

The list of partitions to be activated by the detector alarm can be specified here. The partitions only respond to normal events, ignoring technical events.

Important: *if all the partitions associated with a detector are inactive, the detector will not transmit events and alarms! If the detector must always be active, it is recommended to add an always-active partition without any actions to the list of partitions associated with the detector.*



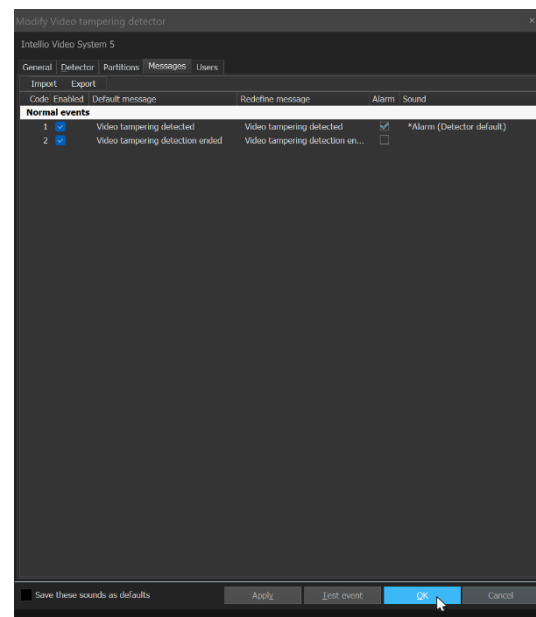
20.2.1.3. Messages

It is possible to set which events of a given detector are allowed and whether they appear as alarms or simple signals.

If an event type is checked in the **Alarm** column, an alarm will be triggered when the corresponding event occurs (e.g., the alarm will appear with a red background in the Events panel at the bottom of the Live View).

If only the left-side Enabled box is checked, then only a **Signal** will occur (e.g., the signal will appear in yellow in the Events panel).

You can override the default sounds with custom event sounds. In the **Sound** column, you can open the dropdown menu and select any sound that will play when the event occurs. You can also select your own sound file by clicking the **Add** option at the bottom of the list.



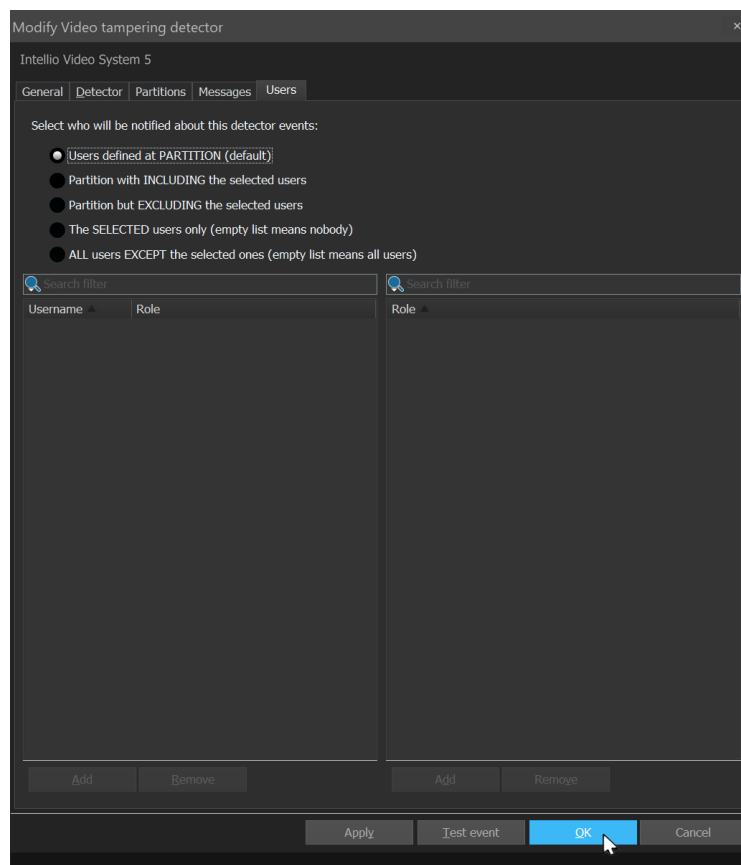
These settings can also be saved to the detector type by checking the **Save these sound as defaults** checkbox at the bottom.

The settings in the Messages tab can be exported and imported, allowing the same message settings to be imported into multiple cameras with the same type of detector.

20.2.1.4. Users

On this tab, you can specify which users or roles should receive notifications about detector events:

- **Users defined at PARTITION (default):** In this case, only the users and roles specified for the partitions assigned to the detector will receive detector events.
- **Partition with INCLUDING the selected users:** Users and roles specified for the partitions assigned to the detector will receive events, supplemented by those listed here.
- **Partition but EXCLUDING the selected users:** Only the users and roles specified for the partitions assigned to the detector will receive events; those listed here will be excluded.
- **The SELECTED users only (empty list means nobody):** In this case, users and roles specified for the partitions assigned to the detector will not be considered; only those listed here will receive notifications. An empty list means nobody will be notified.
- **ALL users EXCEPT the selected ones (empty list means all users):** In this scenario, everyone will receive events except those listed here. An empty list means everyone will receive notifications.



20.2.1.5. Detector

You can configure the settings for the detectors here. A more detailed description of the built-in detectors for the cameras can be found in the following chapters.

20.2.2. Create masks

The mask is created on the camera's preview image, and it is located on the second tab of the detector settings window, called **Detector**.

There are three types of masking modes: one creates polygons, the second creates lines, and the third creates a complex line divided into multiple segments..

20.2.2.1. Polygons

About half the detectors have this masking mode.

To select a polygon, click on the selected corner with the mouse and move around the object by clicking on the neighbouring corner. The corners of the polygon can be moved later, but removing or adding corners is not possible. To do that, erase the polygon and redraw it. Steps of the drawing:

- Click with the **left mouse button** in the starting point.
- Move to the next corner of the polygon, then click again with the **left mouse button**.
- Repeat this process until all of the corners have been selected, then click on the **right mouse button**.



You can drag the whole polygon by clicking on the green area anywhere.

You can create several polygons. The detector will function according to its definition within the selected area.

The Motion detector and the two-monitoring sensor (Monitoring, Recording) can handle several masks. In this case, each mask can contain polygons with each mask applying different rules.



20.2.2.2. Straight lines

In the other masking mode, lines can be easily created using the **left mouse button** by simply selecting the two endpoints of the line. This masking mode allows multiple lines to be defined.

20.2.2.3. Complex line

Setting up this type of mask is similar to the polygon type, with the difference that here you need to mark the **breakpoints** using the **left mouse button**. You can **close** the complex line using the **right mouse button**. A special feature of the complex line is that the lines can intersect, although this is rarely needed in practice.



To modify an already created mask type, click on the selected area or line. The corner points of the area or line will turn blue, indicating that they can be edited. For polygon-type masks, a red dot appears in the middle of the selected area.

You can make the necessary changes by dragging the corners, breakpoints, or endpoints with the left mouse button. The edges can also be moved, not just the corners. To do this, click and hold the left mouse button and drag the selected edge.

It is important to note that corners or edges cannot be removed from a mask. In such cases, you must delete the selected area or line and then create the desired mask again.

To delete an area or line, select it and press the **Delete Selected Area** or **Delete Line** button.

20.2.3. Calibrate the camera

Calibration is essential for an Intellio Visus camera to be able to calculate the real spatial distances and hence the dimensions of the displayed objects. Based on this information the camera can decide in the whole perspective whether the object is a vehicle, human, small object, or something it cannot identify or insert into these categories.

The calibration is done one by one, every camera has to be calibrated separately (considering that two cameras rarely have the same field of view from the same perspective, this method seems unambiguous). The steps are the following:

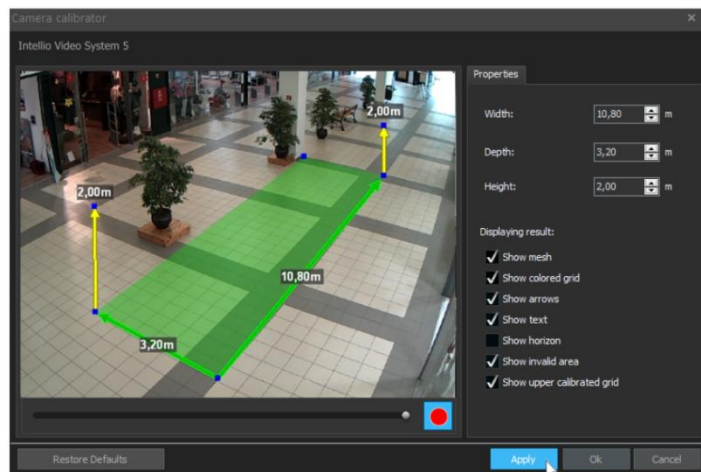
- Select **System Configuration / Devices / Cameras**.
- Select the camera which will be calibrated.
- Click on the **Calibrate** tab and push the **Calibrate Camera** button.

On the preview image, you need to set the coordinates (direction, length) and the real-world size represented by the arrows. This setup requires attention, so try to perform it as accurately as possible. More precise calibration results in more effective detector performance. Calibration tips and notes:

- You can **move the coordinate** endpoints by holding down the **left mouse button**.
- Make sure that the adjustment arrows do not go outside the visible area (calibration will still work if the coordinates extend beyond the visible range, but the length and position of the axis cannot be adjusted if you cannot grab the end of the arrow).

- During calibration, try to use known properties of available objects or people (such as meters, right angles, etc.); although these are not always available, using them can greatly improve accuracy.
- Use the largest possible distances; this helps reduce errors caused by inaccurate calibration (a ten-centimeter difference is not the same over one meter as it is over ten meters).
- Always set the directions to match the real-world directions; what appears to be a right angle on the camera preview image may not be one in reality. If you're unsure about the angles, place a box in the field of view and use it as a guide.
- The set coordinates must always form a right angle with each other in the real world.

When calibration is complete, press the **Apply** button. After that, by enabling the settings under **Displayed Results**, the effects of the calibration will appear (the more accurate the calibration, the smaller the invalid area and the better the top grid aligns with the ends of the arrows). If the result is satisfactory, confirm the calibration.



20.2.4. Configure the tracker

Configuring the tracker means setting up rules concerning the moving objects. These rules help to track object movements, identify objects according to their size, set up filters to disregard movements that are the result of shadows or moving leaves in the breeze, or defining whether two objects are the same or not. These settings are quite important, and each camera has to be configured differently according to the placement and the field of view.

The next three parameters define the term of the tracking. All of them have to come true for a moving object to become tracked:

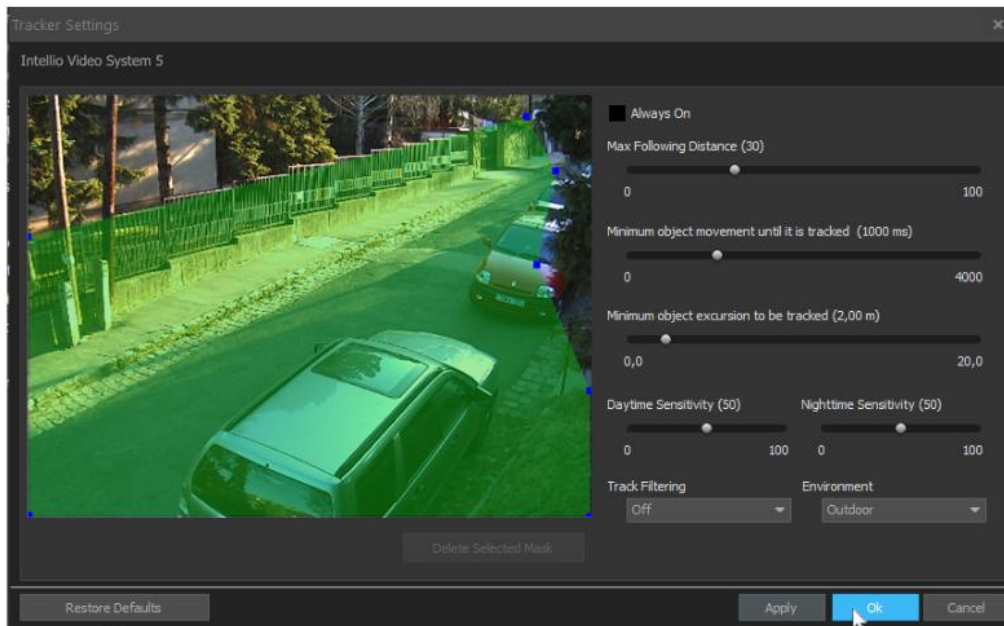
- The movement time of the object before it become tracked.
- The excursion of the object before it become tracked.
- Max following distance.

If any one of these requirements is not met, the object will not be tracked, and the detectors will not react to them. It is important to set these parameters according to not lose any important event.

To configure the tracker of a camera, follow these steps:

- Select **System Configuration / Devices / Cameras**.
- Select the camera which will be configured.
- Click on the **Tracker** tab and push the **Configure Tracker** button.

In the case of ILD VISUS cameras, only the mask has to be set (if the tracker is not needed within the whole field of view), whereas in the case of ILD ORIO cameras the following parameters can be used to set the tracker:



- **Always On:** By enabling this checkbox the tracker will work all the time, not just if it is necessary for the working of a detector.
- **Max Following Distance:** The maximum distance from the object. If in two following image the excursion of the object is within this range, it will be tracked as the same object. If the object is outside of this range, it will be considered a new object, and get a new identification.
- **Minimum object movement until it is tracked:** The minimum amount of time before the object becomes tracked.
- **Minimum object excursion to be tracked:** The minimum required excursion of the object to be become tracked.
- **Daytime Sensitivity:** With this can be set the daytime sensitivity of the trackers. At low sensitivity there is low probability of the false alarm events, but it can cause missing alarms too. At the other side of the scale, it will be highly sensitive, but will generate quite a lot of false alarm. This sensitivity works only during the time the camera is on day mode.
- **Night-time Sensitivity:** Same as Daytime Sensitivity but works in night mode.
- **Track Filtering:** This drop-down list set the strength of the filtering, which means that with **Strict** settings the camera will compare the movement directions to a lot of statistical data to decide whether the movement is a real moving object, or just a tracking error. We suggest to not turn on the filtering because although it filters out the false alarms, can result in filtering out real events too.
- **Environment:** This drop-down list takes over the job of most of the setting options placed in the ILC cameras, using the predefined environmental settings on the selected locations.

20.3. Standard onboard detectors

20.3.1. Sabotage detector

The sabotage detector detects the turning and covering of the camera, or the blurring of the image.

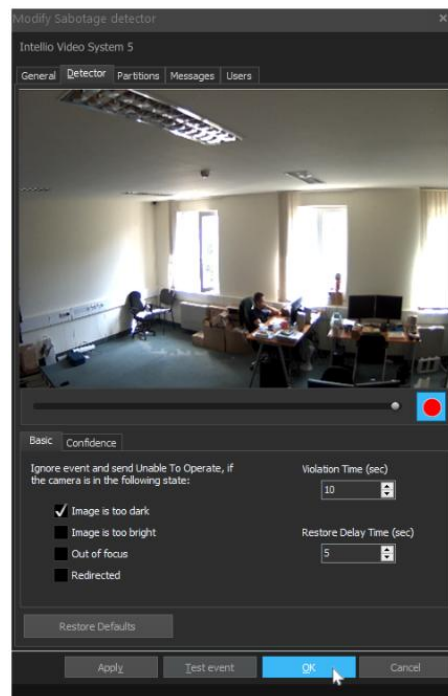
Note: This detector can only be added to cameras in the **VISUS** series.

Onboard; Mask type: none

The detector can detect any circumstances affecting the image quality, while it only sends an alarm in predefined cases. The detector is capable of ignoring the following circumstances:

- **Image is too dark:** The detector does not send an alarm if the image is too dark.
- **Image is too bright:** The detector does not send an alarm if the image is too bright.
- **Out of focus:** The detector ignores blurry, unfocused images.
- **Redirected:** The detector does not send an alarm if the area under surveillance drastically alters.

The detector only sends an alarm after the **Violation Time** is over, in order to avoid sending false alarms. The alarm will be over as soon as the **Restore Delay Time** is up.



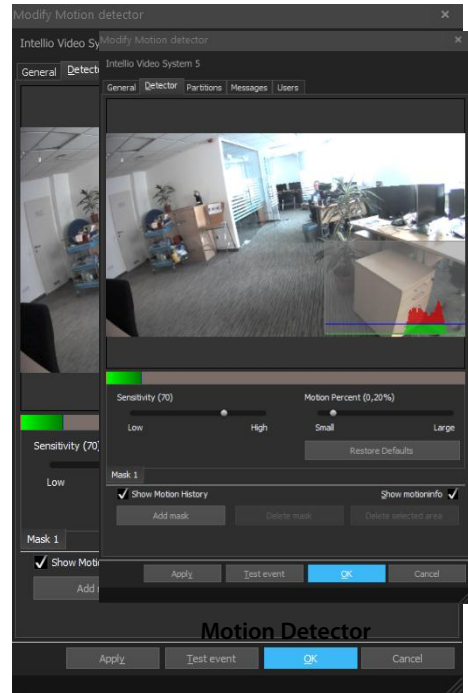
20.3.2. Motion detector

Motion detector alerts if there is motion sensed in the masked area.

Onboard; Mask type: polygons

Multiple masks can be added to this detector, and each mask can have different settings. Two parameters can be adjusted during setup:

- The **Sensitivity** value determines how much difference in light or shade is considered. With a low value, it is possible that a person walking in a jacket with a similar shade may blend into a wall of the same color without being detected by the sensor. With a high value, this won't happen, but the motion detector may also trigger from small lighting changes.
- **Motion Percent** compares the number of moving pixels to the total number of masked pixels. With a low setting, the motion detector may detect even small moving objects or slight lighting changes as motion. However, if the setting is too high, the system may filter out distant moving objects because they appear too small.



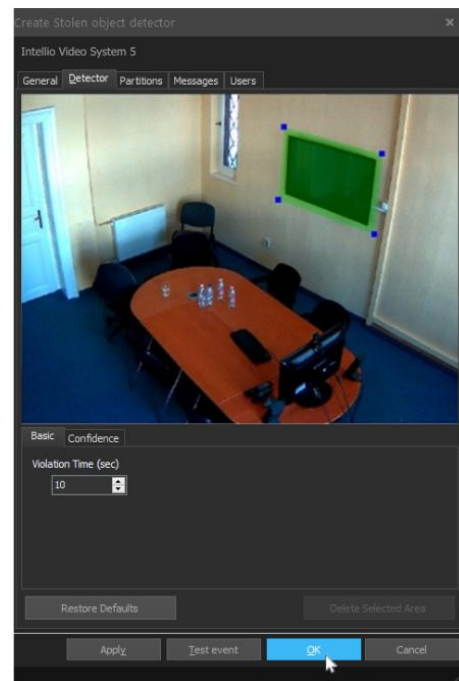
20.3.3. Object removal / Theft

Theft Detection is useful to protect objects. It is able to send alarm if protected objects are removed or stolen from their original place.

Onboard; Mask type: polygons

Make sure when setting the detector that the mask covers not only the protected object but some of its surroundings, too, which should contrast to some level with the object itself for easier detection (in an ideal case, a dark object in a white background). It largely enhances the efficiency of the detector.

- **Sensitivity:** The higher the sensitivity, the smaller change will cause an alarm event. It also means that too high sensitivity will be more likely to cause false alarms. Too low sensitivity, on the other hand, will not alert even if the protected object is stolen.
- **Violation Time:** The delay period between the alarm event and the point in time when the protected object disappeared. If during this time the object is restored, the alarm event will not happen.



20.3.4. Covering detector

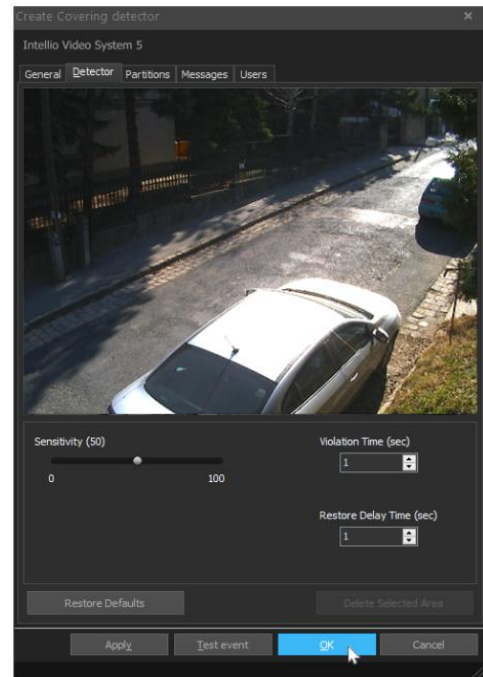
The Covering detector is a sabotage detector: it alerts if the camera's field of view becomes limited.

Note: This detector can only be added to cameras in the **ORIO** series.

Onboard; Mask type: polygons

The Covering detector watches the masked area (or the whole FOV, if there is no mask created), and alerts if there is something obscuring it (box in front of the camera, baseball cap ...etc.).

Since the detector works in the principle of contrast monitoring, if it becomes too dark for the camera, it will shut down with a message called "Unable to operate in low light". This could also happen if the lens of the camera is painted over, so this message can indicate serious problems.



- **Sensitivity:** It sets how sensitive the detector is to the changes of the masked area. With higher value it is easier to set an alarm off.
- **Violation Time:** The time between the alarm event and the point when the covering happened. If during this time the FOV restored, the alarm event will not happen.
- **Restore Delay Time:** The time before the detector sends the restored event message in case the restoration is only temporary. With this it can be stopped the repeated alarm event.

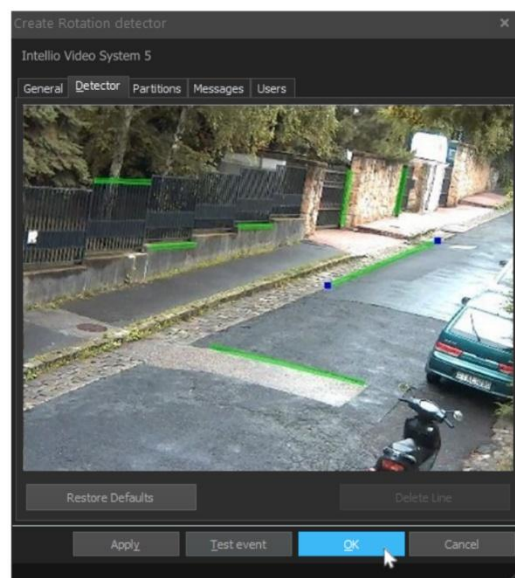
20.3.5. Rotation

Rotation detector is a sabotage detector. It alerts if the camera is turned or removed from its original fixed position.

Note: This detector can only be added to cameras in the **ORIO** series.

Onboard; Mask type: single lines

During the setting of the lines make sure that the lines, or edges have contrast in every time of the day. The bigger the contrast, the better this detector will work. The control lines supposed to be seen all the time, and the more lines we can set, the better. After the lines are set, click on **Apply**, then wait for the lines to turn from red to green. If this doesn't happen in a few seconds, then that particular line is quite possibly wrong, because it can't find an edge. Since these lines will define the stationary area to which the camera will compare, do not set them along possibly moving objects, such as cars, crates, etc.



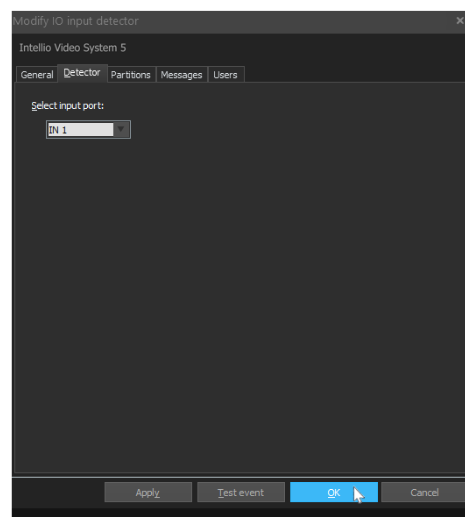
20.3.6. IO Input detector

The I/O Input Detector generates an alert if a signal arrives on the Intellio camera's input port or if the incoming data stream ceases.

The camera input can be configured in the **System Configuration / Devices** page on the **I/O ports** tab.

Onboard

The only thing that has to be configured in this detector is the port that it watches. Because you do not need to analyse the images, there is no need for a mask.



20.3.7. Built-in ANPR Detector

Onboard; Mask type: polygons

The license plate detector built into the ILD-42xN camera is designed to recognize single-line Hungarian license plates, mainly for access control purposes (e.g., barrier control). The detector must recognize the same license plate twice in a row before sending it to the server as an event. We recommend enabling the OSD display on the camera to help with accurate configuration.

- **Plate size (in pixels):** Minimum and Maximum values. Number plates are not recognized if lower than minimum and higher than maximum size.
- **Direction filter:** With the help of this feature the license plates of unwanted cars entering or leaving can be filtered. However, if there are not any cars like this, the feature can be disabled.

- **Mask:** One polygon mask can be configured, which can be used to limit the license plate searching in the covered area.

The built-in license plate detector does not recognize colours and also removes the hyphen from the license plate; therefore, the detector will not correctly assign license plates with colours and/or hyphens to a group. License plates used with the built-in license plate detector must be entered into the database without colours and hyphens, so the operations performed by the detector will run correctly.

20.4. Tracker-based onboard detectors

The tracking-based detectors that work in Intellio Visus cameras are intrusion detectors, direction detectors, line crossing detectors and intelligent motion detectors. Tracker-based detectors identify detected objects by size and colour and monitor their trajectory.

To set these detectors first you have to calibrate the camera and configure the tracker.

Note: Tracker-based detectors give an indication when all 4 corner points of the detected, tracked object pass through the drawn lines or area boundaries. You can help tune the detectors by turning on the OSD.

20.4.1. Entry detector

The Entry detector alerts if a tracked object enters into the protected area. It does not alert for objects moving inside the protected area or for objects moving outside the protected area. It also does not alert for objects leaving it.

Tracker based, Onboard; Mask type: polygons

- **Violation Time:** If the tracked object leaves the protected area before the set time is up, the alarm event will not happen.
- **Minimum Speed to Alarm*:** If the tracked object's speed is below this, the alarm event is not happening, even if the object is entering the protected area.
- **Object colour Filter*:** When enabling, the detector will alert if the tracked object's base colour is one of the selected colours (or a mix of them).
- **Shadow Elimination*:** The detector will try to determine whether the object entering the area is a shadow or not.
- **Object types*:** The camera will send alarm if one of the selected object types enters into the protected area. For e.g. if the Human type is selected and a Vehicle enters into the area it will be ignored and so on.



*: the object filtering options can vary depending on camera type and firmware version. See the camera's instruction manual for details.

20.4.2. Direction detector

The Direction detector's main function is to alert if an object moves to the wrong direction in the masked area. This can be useful in monitoring one-way traffic for example.

Tracker based, Onboard; Mask type: polygons

During the masking there is only one polygon can be set. The forbidden direction can be set with the help of the arrows appearing on the preview display. This "trident" can be dragged by pressing the left mouse button on base of the arrows. The forbidden direction can be set by rotating the "trident" to that way (the red arrow shows the wrong direction) by dragging the arrowhead. The two blue aide arrows show the tolerance. If the angle is low, the detector will only alert, if the moving object's track is almost exactly in line with the forbidden direction. With high angle, the detector alert more often. The highest angle is 90°, which means that the detector will alert even if the moving object's track is normal to the forbidden direction.

- **Violation Time:** The time between the alarm event and the point when the protected object disappeared. If during this time the object is restored, the alarm event will not happen.
- **Object colour Filter*:** When enabling, the detector will alert if the tracked object's base colour is one of the selected colours (or a mix of them).
- **Shadow Elimination*:** The detector will try to determine whether the object entering the area is a shadow or not.
- **Object types*:** The camera will send an alarm if one of the selected object types is moving in the prohibited direction. For e.g. if the Human type is selected and a Vehicle enters into the area it will be ignored and so on.



*: the object filtering options can vary depending on camera type and firmware version. See the camera's instruction manual for details.

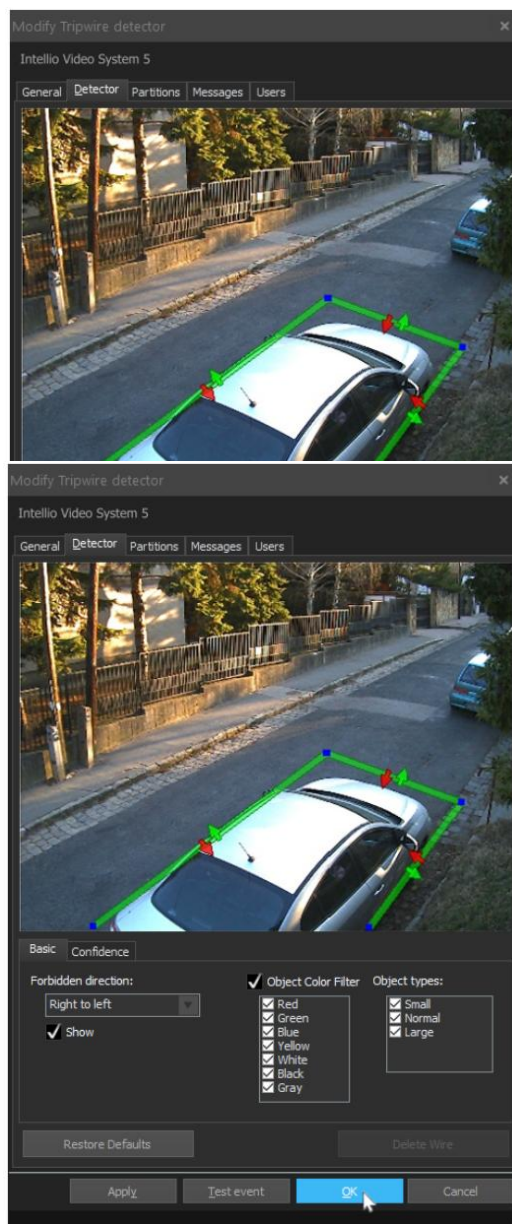
20.4.3. Tripwire detector

The Tripwire Detector alerts if the defined line is crossed from the forbidden direction.

Tracker based, Onboard; Mask type: multiple lines

Before setting up the tripwire, make a plan based on the defended perimeter's layout. Consider the possibility of the crossing of the line from both ways and set the forbidden direction accordingly. The Tripwire will alert at every crossing if it comes from the forbidden direction.

- Forbidden direction:** This drop-down list contains the forbidden directions. This can be **Left to right**, **Right to left**, or **Both**. The left and right side depends on the order of the set break points, for example if the first end point of the tripwire is in the top of the image, and the next is on the bottom, the left side will be right side of the image. If an object crosses the tripwire from the wrong side, it alerts.
- Show:** This checkbox helps the settings by showing the forbidden directions. With the help of this it is easy to see the directions of the crossings.
- Object Colour Filter*:** When enabling, the detector will alert if the tracked object's base colour is one of the selected colour (*or a mix of them*).
- Shadow Elimination*:** The detector will try to determine whether the object entering the area is a shadow or not.
- Object types*:** The camera will send alarm if the tracked object is one of the selected object types.



*: the object filtering options can vary depending on camera type and firmware version. See the camera's instruction manual for details.

20.4.4. Intelligent motion detector

The Intelligent Motion Detector detects motion, the same as the Motion Detector, but the Intelligent Motion tracker based, so it is able to differentiate between different sizes, able to detect movement speed, etc. It is useful in an outdoor environment, where the constant movement of the vegetation would result in a constant alarm with an ordinary Motion Detector.

Tracker based, Onboard; Mask type: polygons

- **Violation Time:** The time between sensing movement and the alarm event. If the movement stops during the masked area during this time, the alarm will not sound.
- **Minimum Speed to Alarm*:** If the tracked object's speed is below this, the alarm event is not happening, even if the object is moving in the selected area.
- **Object Colour Filter*:** When enabling, the detector will alert if the tracked object's base colour is one of the selected colour (or a mix of them).
- **Shadow Elimination*:** The detector will try to determine whether the object entering the area is a shadow or not.
- **Object types*:** The camera will send alarm if the tracked object is one of the selected object types.



*: the object filtering options can vary depending on camera type and firmware version. See the camera's instruction manual for details.

20.4.5. Hidden, built-in motion detector

Hidden detectors help the system operate more efficiently, and in normal cases, the user does not need to interact with them. Hidden detectors are created automatically by the system. The parameters of hidden detectors can be configured just like regular detectors, and their alerts can be used in the alarm system. Hidden detectors can be found under the **Hidden** group on the **System Configuration / Alarm / Detectors** menu.

The hidden built-in intelligent motion detector supports the system's "Smart Playback" function. With it, the user can use "Smart Playback" features even if no separate intelligent motion detector was created. The detector can only be deleted if the camera linked to it has already been removed.

21. Further steps

For an overview of additional system settings, please refer to the *IVS Installation Manual* documentation.