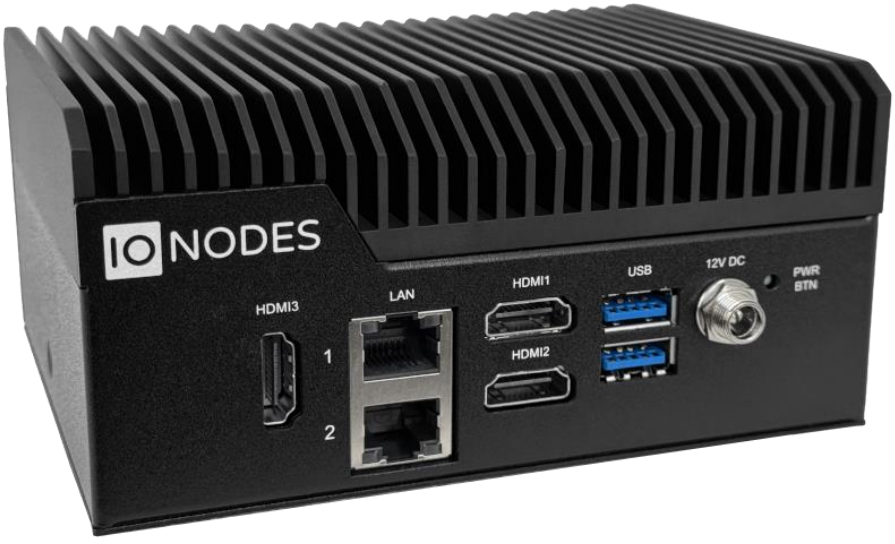
ION-R300 User Manual

Triple Monitor Secure Display Station

Document Version 1.2



ION-R300

User Guide

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The following words and symbols mark special messages throughout this guide:

Warning: Text set off in this manner indicates that failure to follow directions could result in damage to persons or equipment.

Note: Text set off in this manner indicates special instructions which should be paid attention to.

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1 Important Safety Instructions

Warning: Read and save these instructions. Follow all warnings and instructions specified within this document and/or on the equipment.

Warning: The unit will be powered on upon connecting a valid power supply source. Please make sure to properly shutdown the device's operating system prior to removing its power source.

The equipment shall be installed in a fixed or desktop configuration and should be installed by qualified personnel only (person having the appropriate technical training and experience necessary for product installation).

When installing the equipment, please make sure that cables are installed so that accidents cannot occur. Cables connected to the equipment must not be subject to mechanical strain.

To reduce the risk of fire, electric shock and/or injury, observe the following:

- Do not position the equipment such that persons could walk on the connected cables.
- Do not spill any type of liquid substance on or near the equipment.
- Do not touch the equipment and its connected cables during an electrical storm.
- Do not attempt to connect this equipment to electrical outlets controlled by switches or automatic timers.
- Do not attempt to perform hardware service on this product yourself. Refer servicing to IONODES technical service personnel. Never open the device yourself as this will make the warranty void.
- The equipment should be situated away from heat sources such as radiators, heat registers, stoves, or other products that produce heat.
- Do not place a heavy object on or step on the product. The object may fall, causing serious personal injury and serious damage to the product.

Note: Opening the equipment case, damaging, or altering the tamper proof label will void the warranty.

2 Cleaning Instructions

- Unplug this product from the wall outlet before cleaning.
- Use a soft dry cloth for cleaning.
- For stubborn dirt, soak the cloth in a weak detergent solution, wring well and wipe. Use a dry cloth to wipe it dry. Do not use any type of solvent, as they may damage the surface of the product.

3 Handling Notes

When shipping the product, the original shipping carton and packing materials should be used. For maximum protection, repack the unit as it was originally packed at our factory.

Do not use volatile liquids near the unit. Do not leave rubber or plastic products in contact with the product for long periods of time. They will leave marks on the surface finish.

Warning: Under normal ambient temperature and reasonable surrounding air flow, the ION-R300 is designed to remain below safe temperature for brief skin contact. It is not designed to be held during operation. Heat dissipation can be increased by mounting it on a larger metal equipment, such as a shelf, enclosure or monitor mounting bracket, or by directing forced air towards it.

4 Moisture and Condensation Notes

Moisture condensation will damage the product. Read the following notes carefully. Condensation occurs during the following cases:

- Transferring the product directly from a cold place to a warm place.
- Using the product in a room where you just turned on the heater, or a place where the cold wind from an air conditioning unit directly hits the unit.
- In the summer, when moving the product to a hot and humid place after leaving an air-conditioned space.
- Using the product in a humid place.

Warning: Do not use the product when moisture or condensation may occur. If the product is used in such an environment, it may damage discs and internal parts.

5 Before you begin

5.1 About the ION-R300

The ION-R300 triple-port decoder delivers high quality video decoding and display to the video surveillance market. It is an embedded, high-performance digital video decoder, capable of decoding multiple H.265, H.264 and/or MJPEG video streams and displaying them on up to three digital displays at up to 4K resolution.

The high-performance decoding capabilities of the ION-R300 offer a cost-effective way to decode and display digital camera streams. The ION-R300 provides innovative configuration options and tools that can significantly decrease the amount of time and effort required to deploy a unit. Using web-based configuration tools, users can easily and remotely manage all aspects of the appliance.

To support high-performance decoding, while keeping the total cost of ownership within budget constraints, the ION-R300 uses highly efficient hardware-based stream decompression.

The ION-R300 is fully compatible with H.265, H.264 and MJPEG video streams provided by most third-party IP cameras and video encoders on the market.

5.2 Parts List

Qty	Description
1	ION-R300 appliance
1	12V DC power supply with US power cord (EU/UK power cords are optional)
1	VESA mounting bracket and screws
1	Product Flyer

Below are additional items which are not included but may be required:

- USB mouse & keyboard
- HD/4K Displays (HDMI)
- Network switch, with or without internet access
- Power bar with surge protection

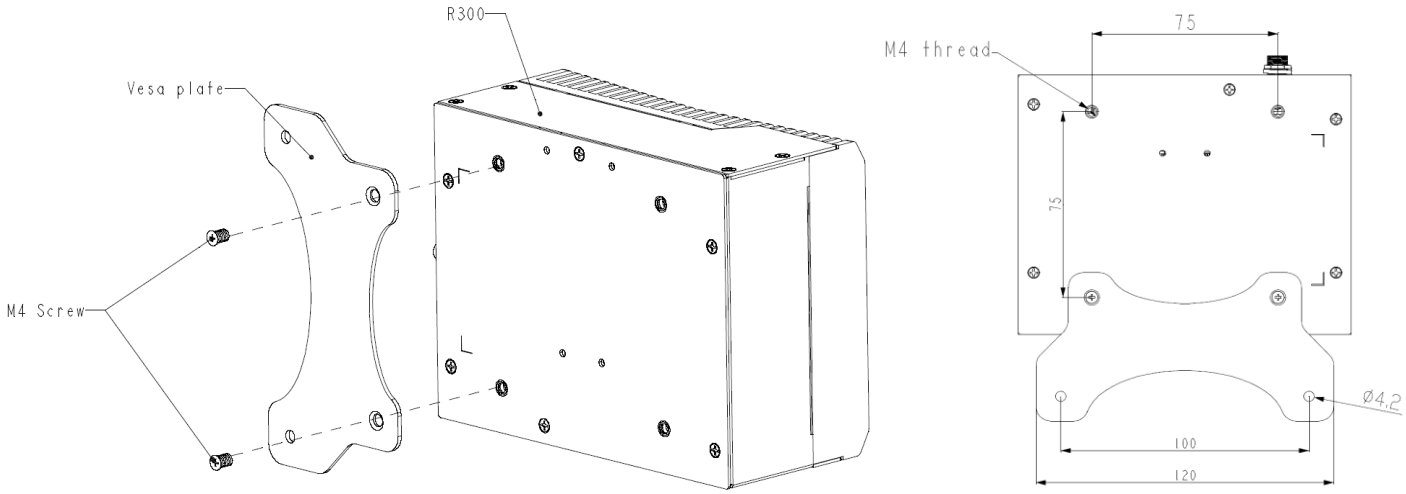
Note: When unpacking, inspect the shipment box and appliance to identify any possible damages due to shipping. Make sure all items have been delivered and that no items are missing. Contact your IONODES representative should you find any damages or defects.

Note: The product serial number label helps the IONODES product support team identify your device and its factory configuration if your ION-R300 or its components require service. The label is attached on the underside of the enclosure.

6 Hardware Installation

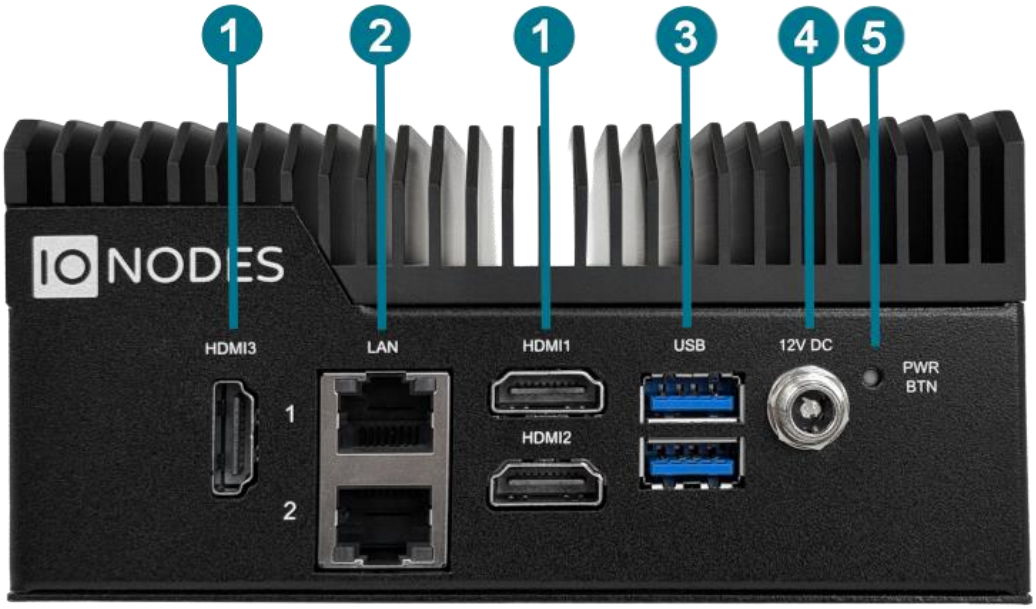
6.1 Equipment Installation

The ION-R300 can be placed on a flat surface, such as a desktop, or mounted via the built-in 75x75mm VESA M4 threads and 75mm to 100mm plate included (illustrated below). When installing the ION-R300, position the unit to allow for cable clearance at the front of the unit. Ensure that minimal air flow is provided to the unit.



6.2 Connections

The ION-R300 offers several input / output connections.



1. **3x HDMI**

   HDMI 2.0 connector interfaces for video outputs at resolutions up to 4K60Hz.

2. **2x 10/100/1000/2500 Base-T Ethernet**

   ION-R300 Ethernet network ports. Please use RJ45 CAT5e or CAT6 network cables. Note that the ION-R300 cannot be powered using Power-over-Ethernet (PoE).

3. **2 x USB 2.0**

   General purpose USB connector interfaces. Can be used to connect an optional keyboard or mouse.

4. **Power IN**

   Appliance power connector. Connect to the power supply block provided with the appliance (12VDC lockable plug).

5. **Power Button (recessed)**

   The recessed power button can be used to turn the unit on or off. Unless the ION-R300 is powered down using this button, it will start as soon as input power is applied.

7 Powering the ION-R300 for the first time

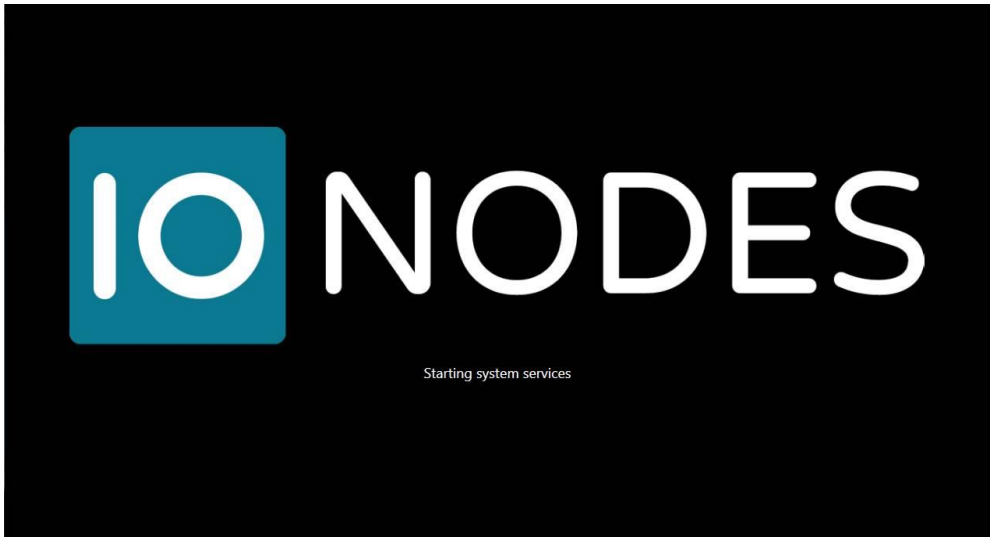
Before you can use the ION-R300, you need to connect the following cables:

- Display(s)
- Ethernet network(s)
- Keyboard and mouse (optional)
- Power

Connecting a keyboard and mouse to the ION-R300 allows configuring the ION-R300 locally and for this reason are recommended. If you plan to configure the device remotely, the keyboard and mouse are optional.

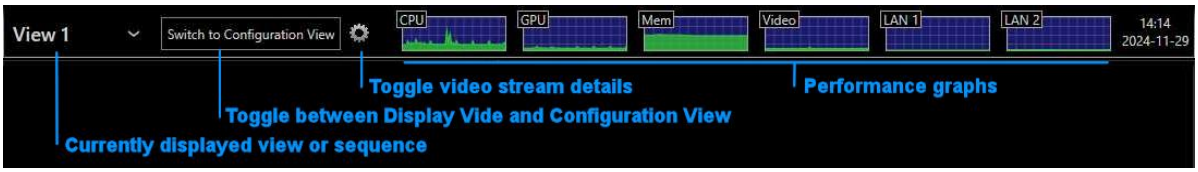
Note: The only layout supported for a directly attached USB keyboard is US QWERTY. This is due to the closed nature of the embedded OS, which prevents any changes to its default configuration.

Once all the required cabling is connected, the ION-R300 will start automatically. After a few seconds, the image below appears on all connected displays:



When the device is ready to be used, the displays switch to the main user interface:

The ION-R300 can now be configured.



- Currently Displayed View or Sequence

  In the top left corner appears the view or sequence currently displayed. You can select a different view by clicking the down arrow beside the view name. Views are configured using the device's web interface or by switching to configuration view (see below).

- Switch to Display/Configuration View

  This button allows you to toggle between displaying video and the configuration interface.

- Video Streams Details

  When in display view, toggle this button to display performance details about each video tile:

  - Video stream name and URI displayed in the video tile
  - Current connection state
  - Stream Resolution

- Current framerate and bitrate
- Network packet lost count (displayed only when one or more packets are lost)

- **Performance Graphs**

  These graphs show the device's recent resource usage.

  - CPU: shows the main processor's activity
  - GPU: shows the graphics adapter's activity
  - Mem: shows the system's RAM memory utilization
  - Video: shows the video streaming data rate
  - LAN 1: shows the traffic on the Ethernet interface 1
  - LAN 2: shows the traffic on the Ethernet interface 2

8 Device Configuration

Before the ION-R300 can be used on your video network, it must undergo an initial setup step during which its network configuration is determined. This initial configuration setup step is required so that the ION-R300 can communicate with computers and cameras on the network.

Once the initial network configuration step is completed, video output and connectivity settings will need to be set up through the device's web interface. The device keeps this configuration within its internal memory and acts as a fully standalone video decoding & display appliance.

The initial network configuration can be performed directly on the device by connecting a keyboard and a mouse to the ION-R300's USB ports, or it can be performed remotely using a computer or laptop connected to the same network.

8.1 Network Configuration Basics

By factory default, the ION-R300 is configured in DHCP mode (Dynamic Host Configuration Protocol). In DHCP mode, when the device boots up, if it is connected to a network, it scans that network for a DHCP server. If a DHCP server is found on the network, the device requests that the DHCP server provides a unique network address and associated settings. The device then uses the DHCP-provided network configuration to communicate with other computers and cameras on the network.

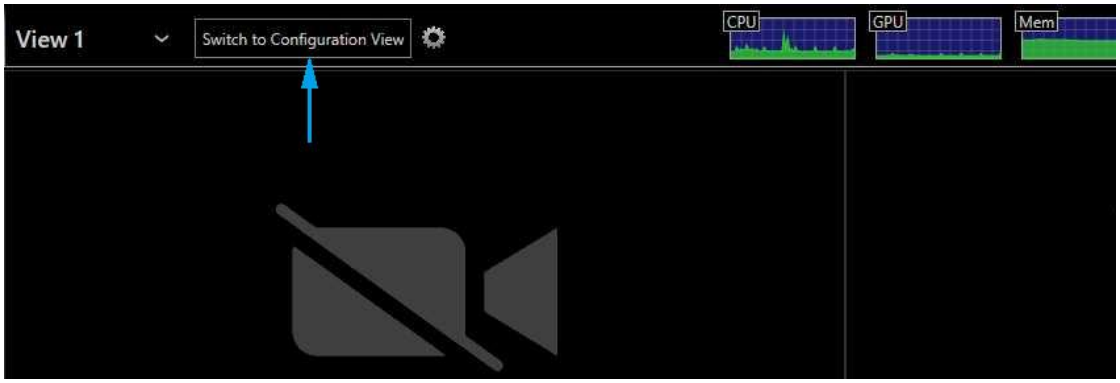
If no DHCP server is found on the network, the device switches to APIPA mode (Automatic Private IP Addressing). In this mode, the device automatically assigns itself a unique network address in the range 169.254.0.1 to 169.254.255.254 with subnet mask 255.255.0.0. APIPA mode ensures that devices in the APIPA network address range can communicate with one another.

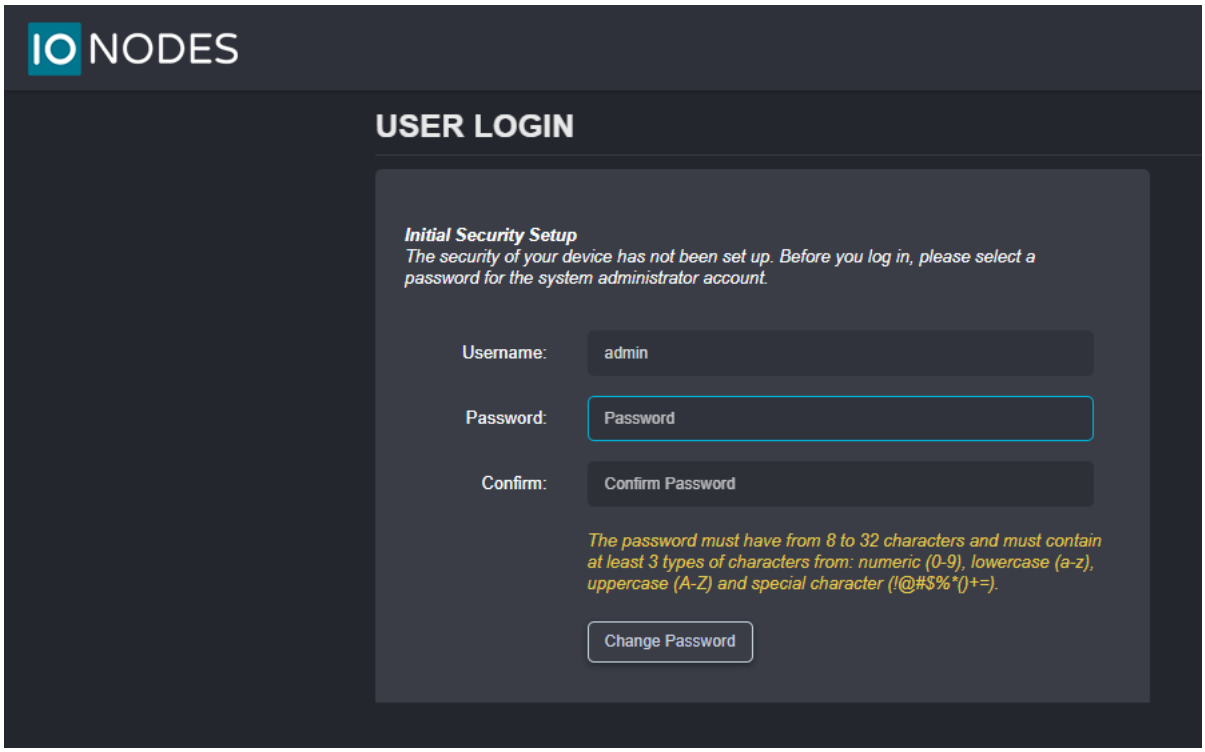
If computers and cameras on your network are not configured in APIPA mode, the ION-R300 will not be able to communicate with them while in APIPA mode. In such a case, the network configuration of the ION-R300 must be set manually.

When the network configuration is set manually, the ION-R300 skips all the steps above and always uses the user-provided configuration. It is then the responsibility of the user to ensure that the network configuration of the ION-R300 is compatible with the computers and cameras on the network.

8.2 Setting Up Initial Network Configuration Locally

The configuration of the ION-R300 can be accessed on the device itself by switching to the configuration view.

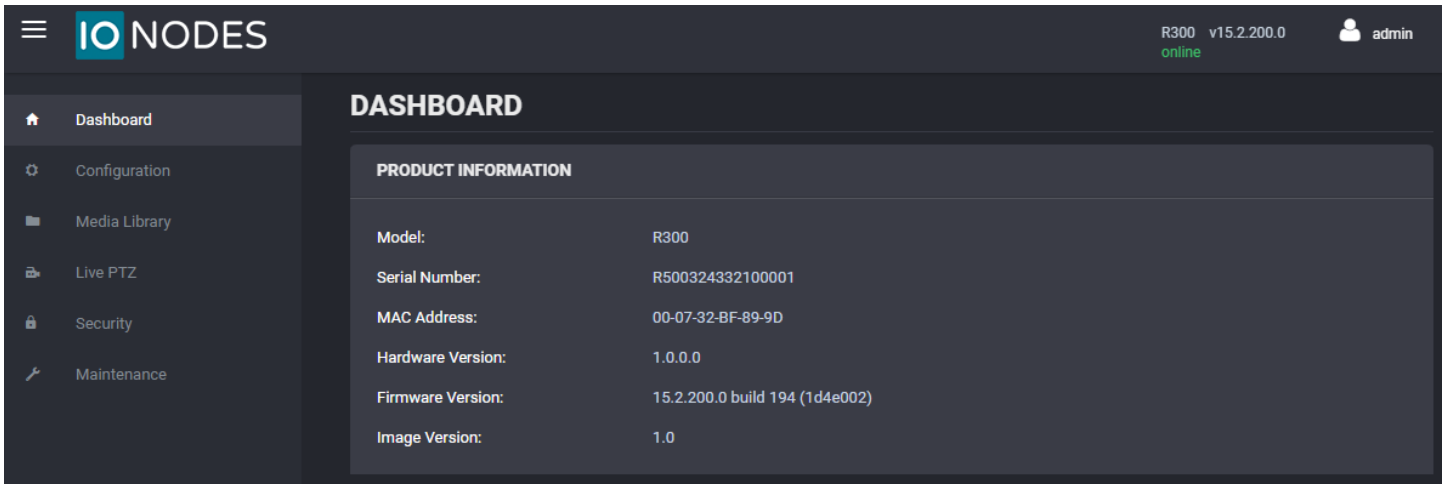




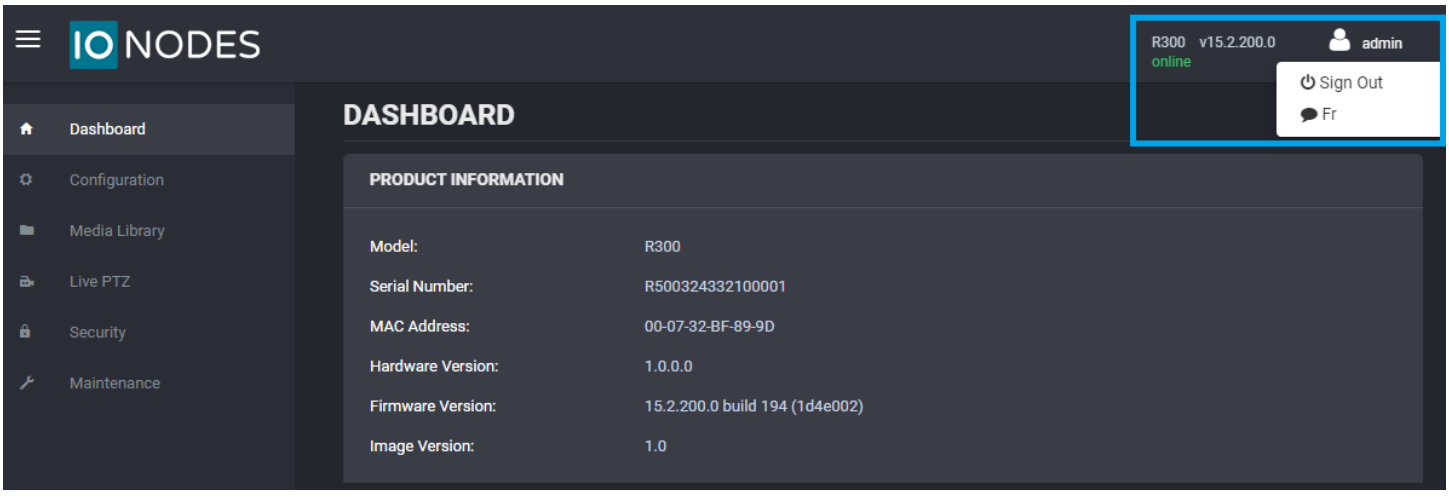
Upon first login, the user is prompted to select a password for the administrator account. The password must have from 8 to 32 characters and must contain at least 3 different types of characters from the following

accepted types: numeric (0-9), lowercase (a-z), uppercase (A-Z) and special character (!@#$%*()+=). Please note that the same screen will also be displayed when doing the initial setup remotely, over the LAN.

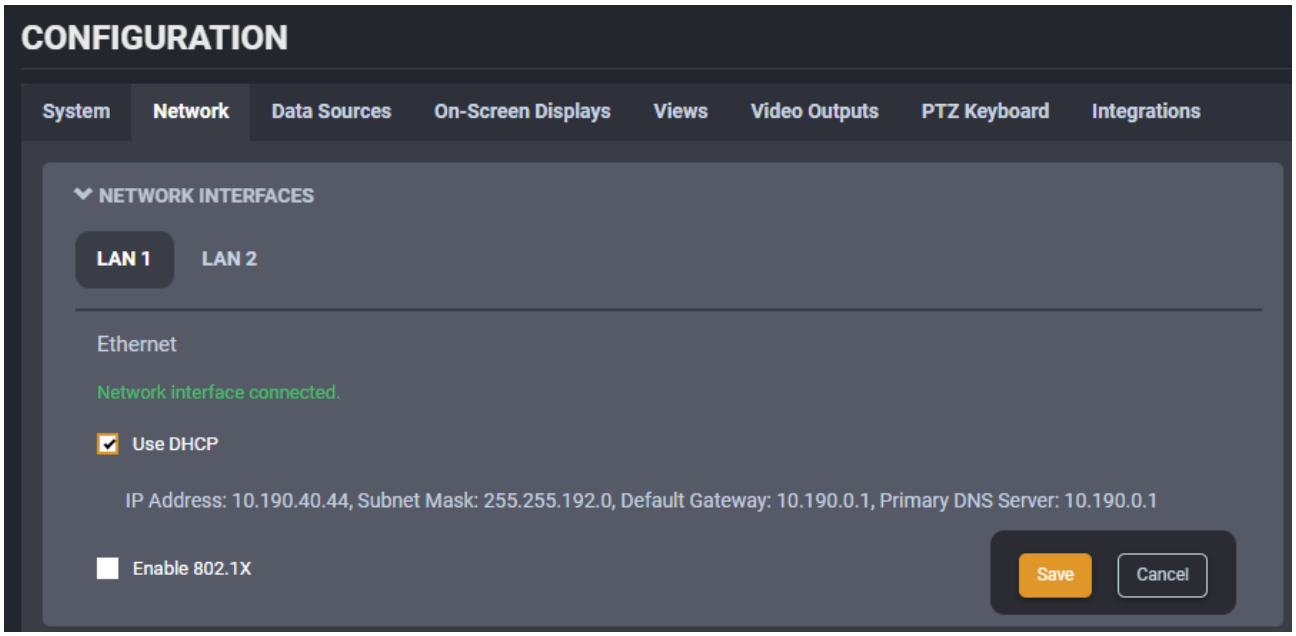
The following screen is then displayed:



You may now also select to change your web interface language from English to French if you so choose by clicking on the user icon and selecting *Fr*.



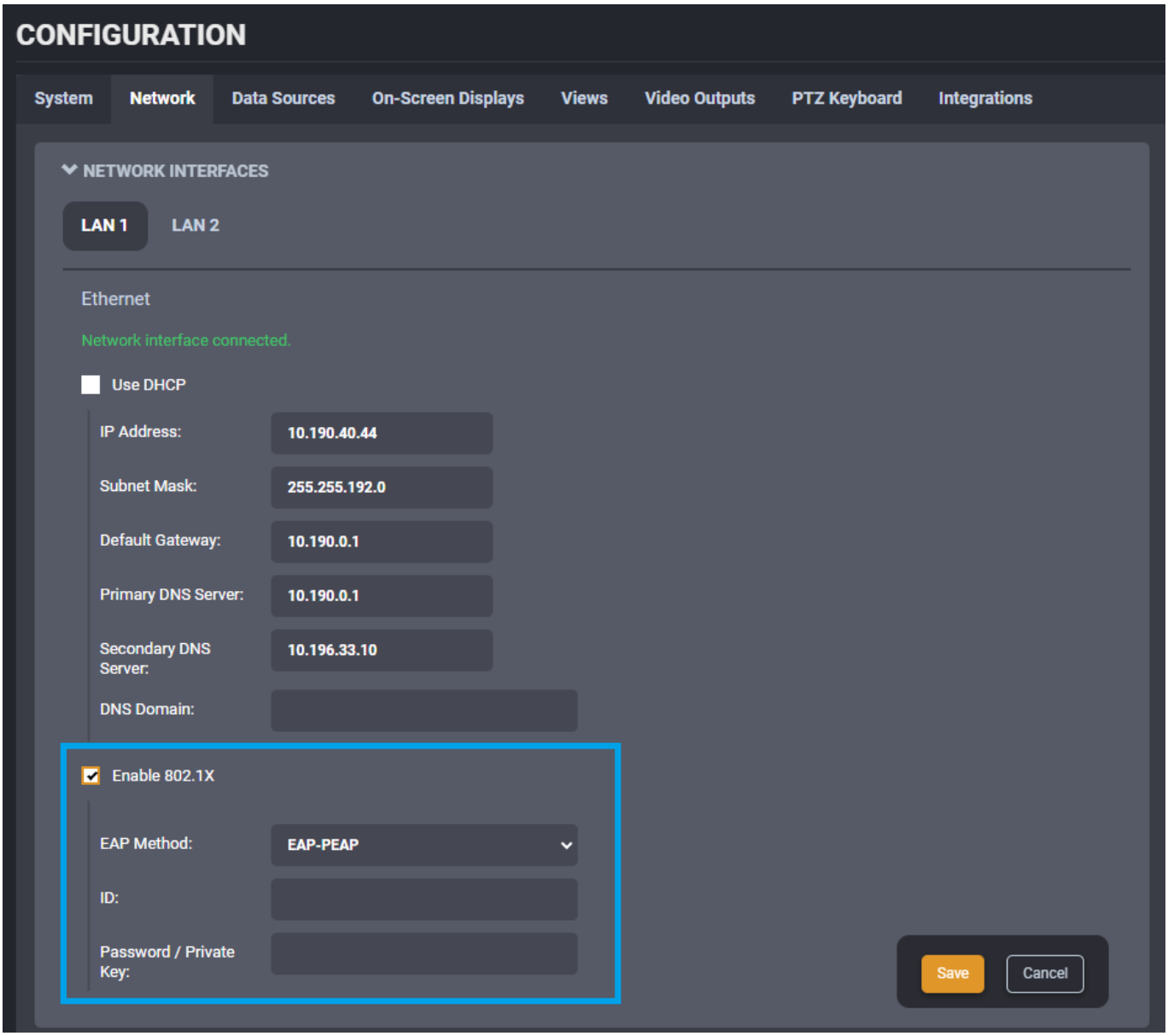
On the left side, select *Configuration*. The configuration interface is then displayed on the right side. Select the *Network* tab to display the network configuration.



The Ethernet network configuration is shown in the first section *Network Interfaces* under the *LAN 1* and *LAN 2* buttons. The first information displayed is the connection status of the Ethernet cable. If the configuration reports the network interface as not connected, check the Ethernet cable between the ION-R300 and the network before proceeding.

By default, the ION-R300 is configured in DHCP mode. To set the network configuration manually, uncheck *Use DHCP*. You can then enter each network setting separately. If you are unsure what values to enter, ask your network administrator to provide configuration settings compatible with your network. At a minimum, a valid *IP address* and *Subnet mask* must be entered. Once this is done, click on *Save* at the bottom to apply the configuration changes.

The R300 supports 802.1x in EAP-PEAP mode. To enable this security feature, check the *Enable 802.1x* box then enter the required information shown below.



ID: Enter the username in 802.1x ID field for authentication

Password / Private Key: Enter the password in 802.1x Password field for authentication.

Click *Save*

The device is now ready to communicate with computers and cameras on your network.

8.3 Setting Up Initial Network Configuration Remotely

Initial device network configuration can also be done via the ION Configuration Tool (ICT), a tool provided by IONODES and that can be found on the IONODES web site at www.ionodes.com.

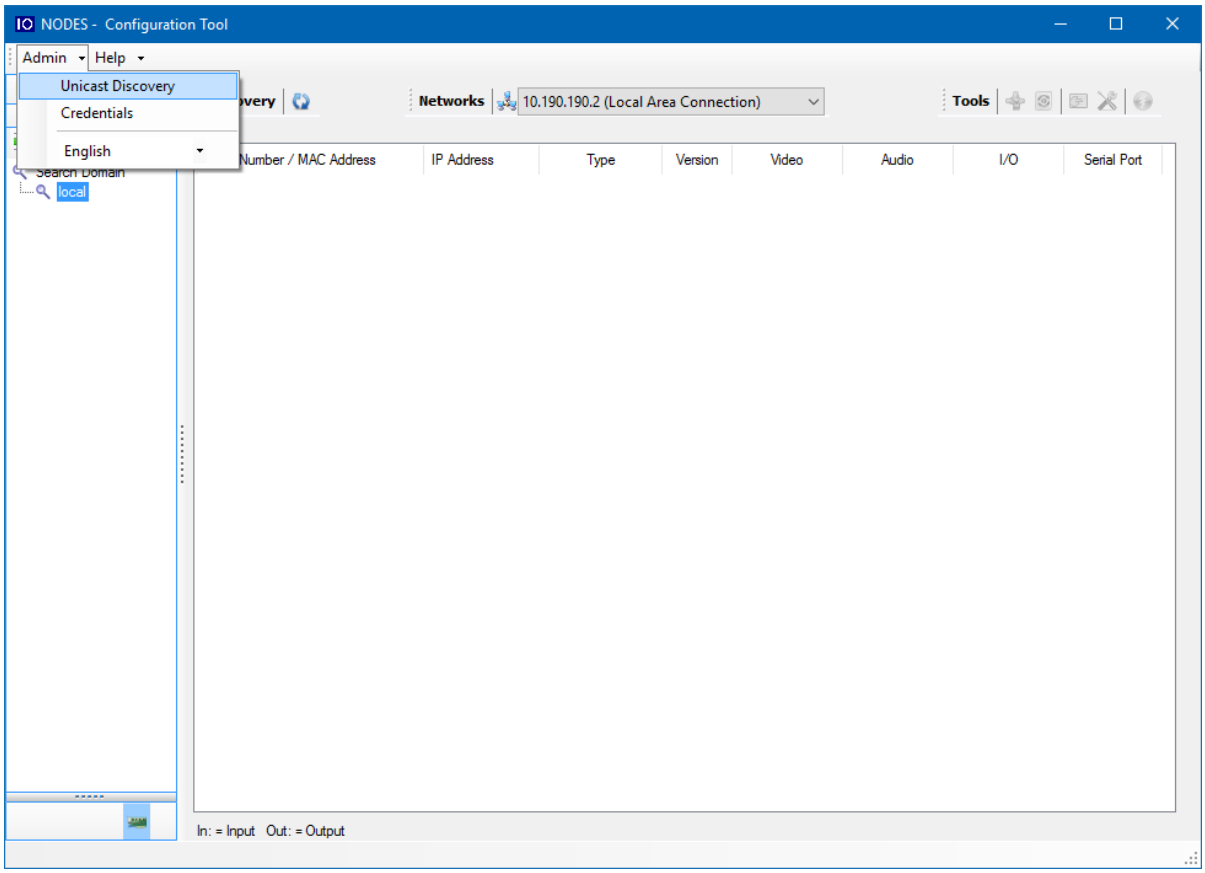
The ICT plays several roles:

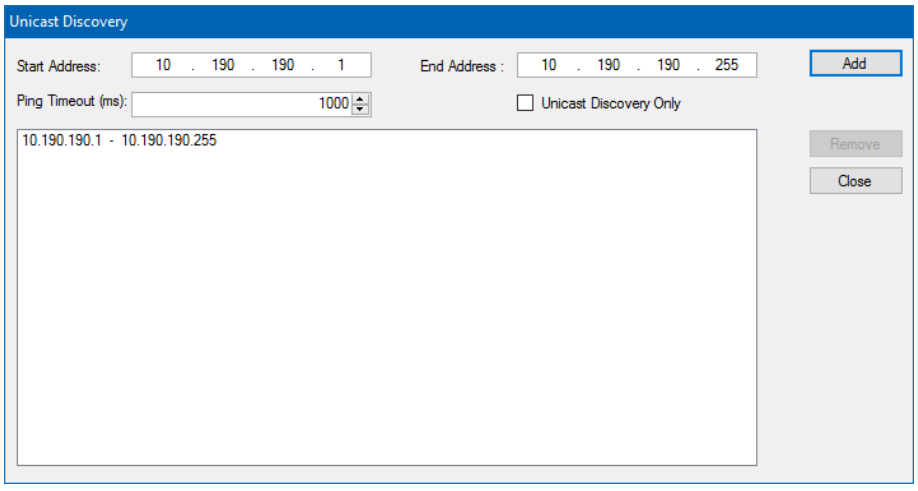
1. Discovery of all ION-R300 and other IONODES devices on the network
2. Remote configuration of the IP address and subnet mask
3. Applying batch firmware upgrade of all common IONODES devices
4. Accessing a device's web-based management interface

Once your device is installed on your network and powered up, launch the ICT from any computer located on the same network as the device.

The ICT supports two methods for discovering a device on the network. The first method doesn't require any configuration and uses the Bonjour discovery protocol. To be able to discover a device via Bonjour, the network must support multicast IP.

If multicast is not supported, you can use the second method: Unicast Discovery. Unicast Discovery can be configured by using the "Unicast Discovery" menu option under the *Admin* menu list.

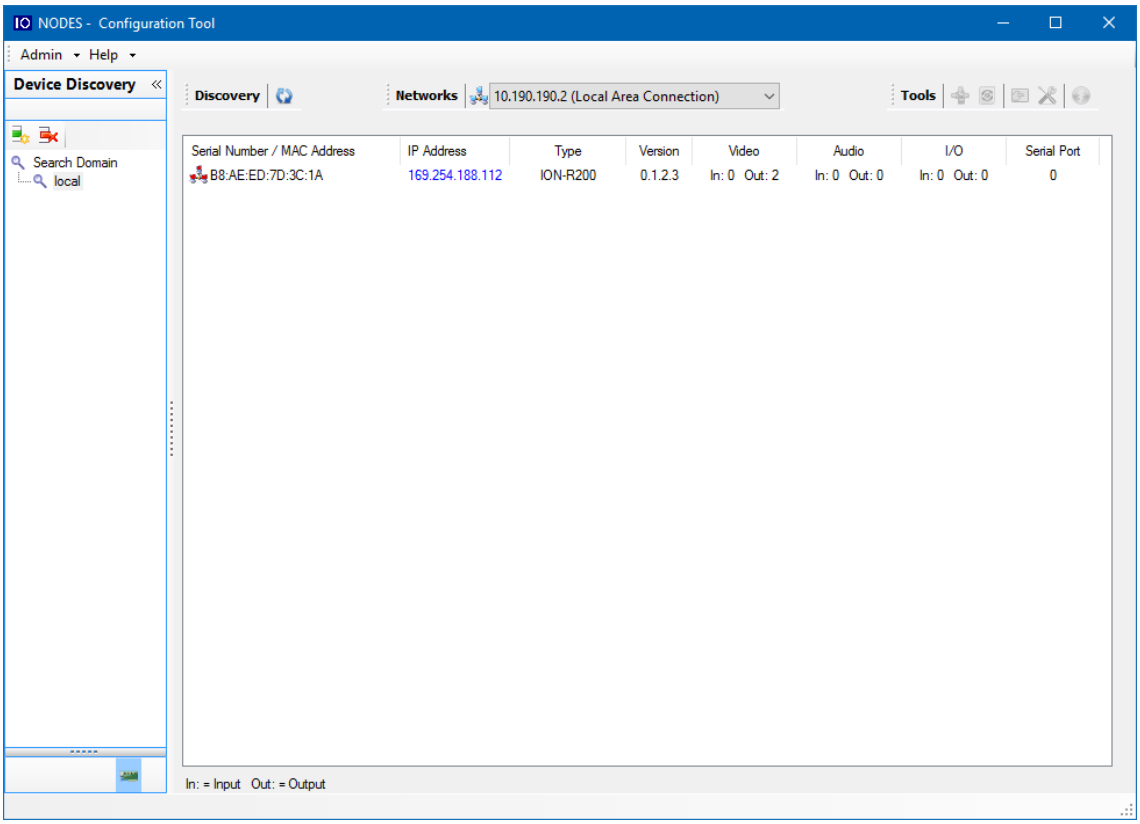




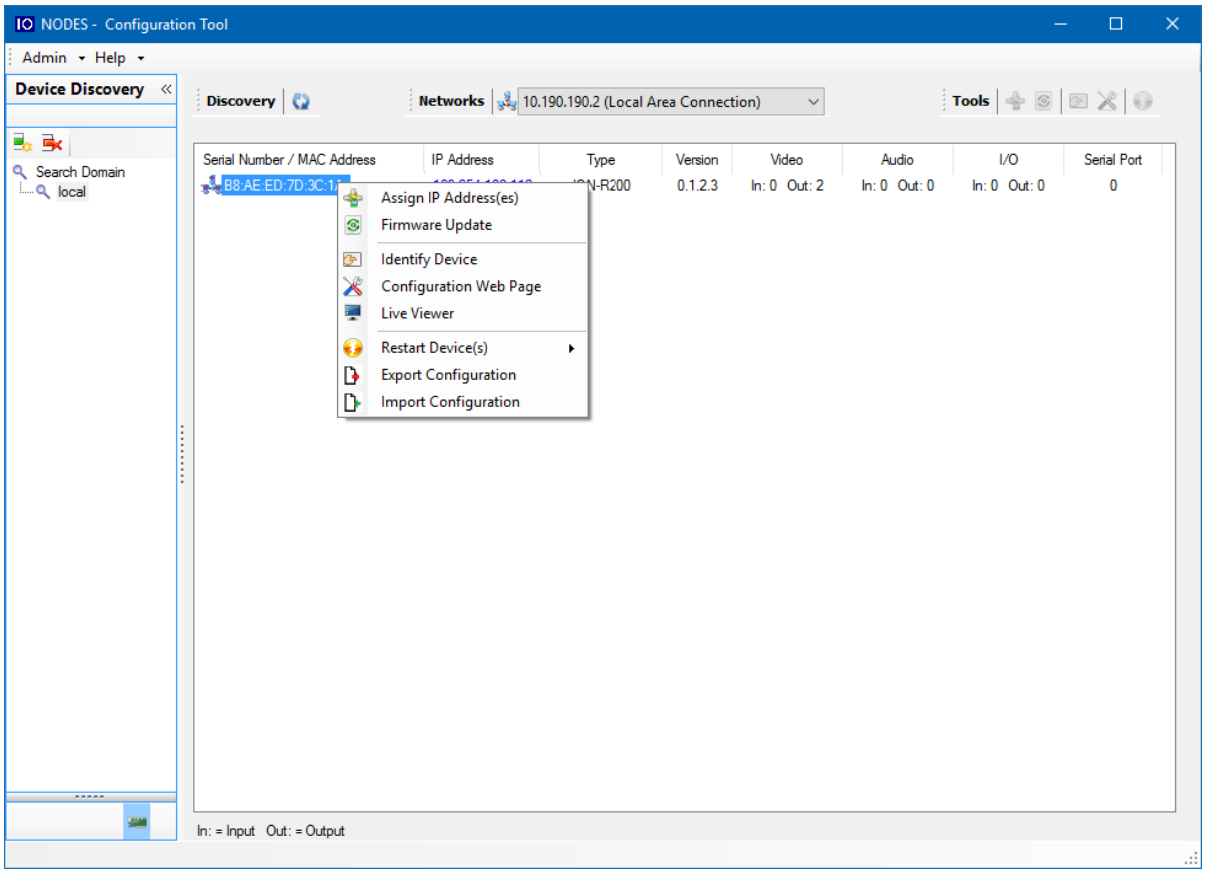
To configure Unicast Discovery, add one or more IP address ranges. Unicast Discovery will attempt to reach a device at a specific IP address in the configured ranges. Discovery can be a long process if the range of IP addresses is large. To accelerate the discovery, add several small ranges of IP addresses.

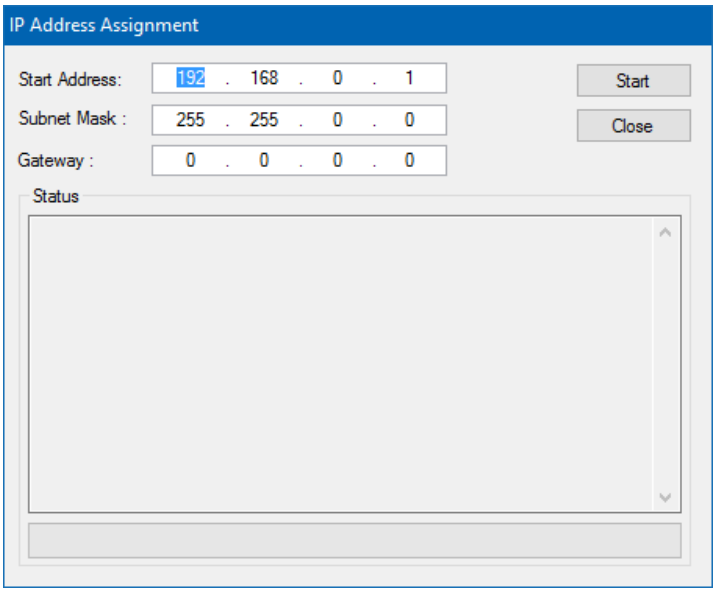
The ping timeout option can be increased for a high latency network.

The ICT will display as many devices as it discovers on the network.



The ICT displays the current IP address of each detected device. If the device is configured in DHCP mode, its IP address appears in blue. To change the IP address of an ION-R300, right-click on its MAC address and select the "Assign IP address" from the context menu then apply the desired TCP/IP settings to the device.



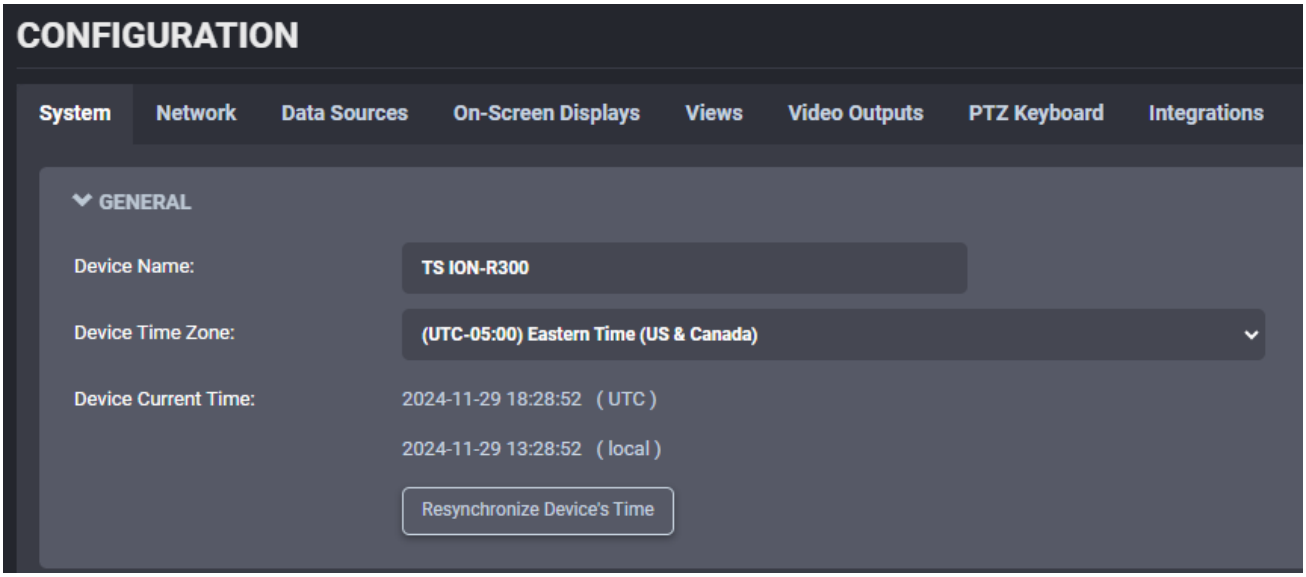


Once the network settings are set, the web-based configuration interface of the ION-R300 can be launched from the ICT or directly in your web browser by typing the device's IP address in the address bar.

8.4 Setting up Time

In the *Configuration* page, select the *System* tab.

To set the time zone in the device, select the appropriate value from the list in *Time zone* then click on *Resynchronize Device's Time*.

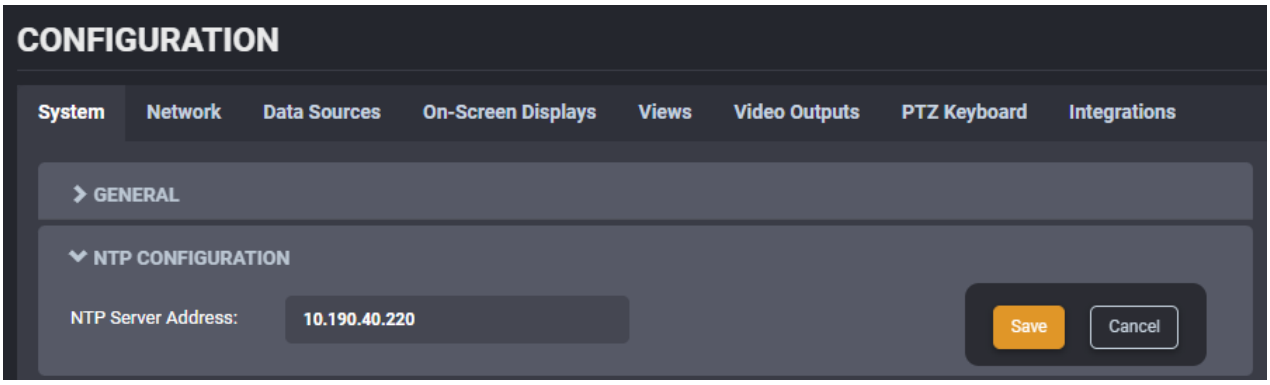


Click the *Save* button to apply the changes.

8.4.1 Setting Up NTP time server

Some networks use a time server, also named NTP (Network Time Protocol) time server. The role of a time server is to synchronize the clocks of all devices on the network. The ION-R300 can be configured to use such a time server to synchronize its internal clock.

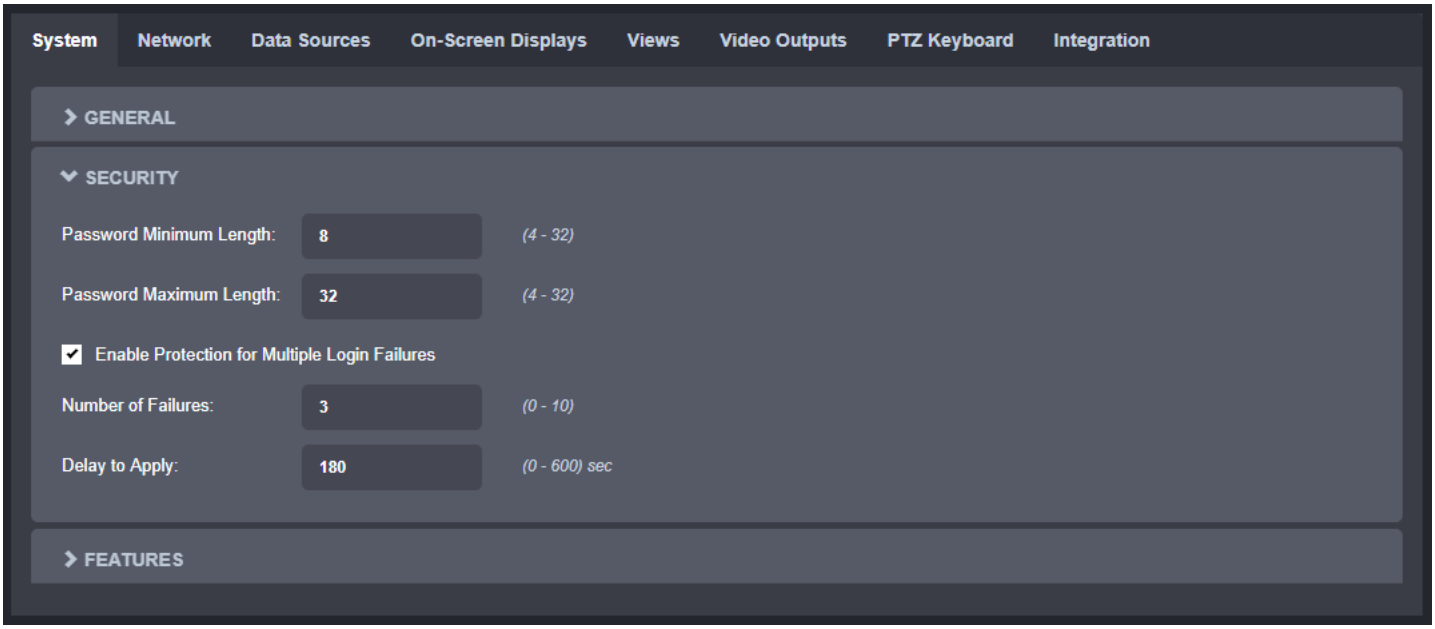
In the *Configuration* page, select the *System* tab and scroll down to the *NTP Configuration* section. Set the proper NTP server address under the *NTP Configuration* header. Click the *Save* button to apply the changes.



8.5 Setting up Security Policy

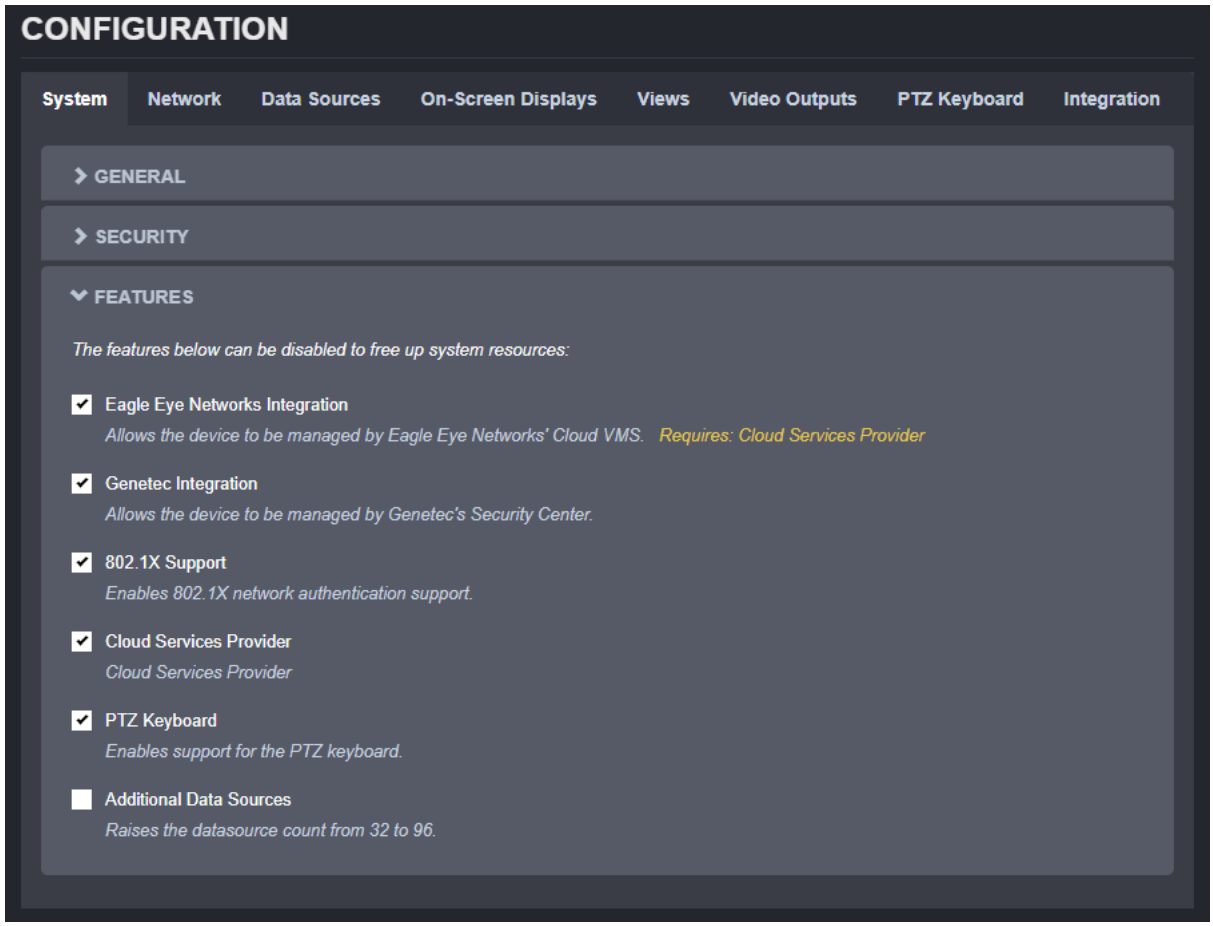
In the *Configuration* page, select the *System* tab and go down to the section *Security*.

Here the user can define the minimum & maximum length of the password for all user accounts. By validating the option *Enable Protection for Multiple Login Failures*, the device is instructed to block all login attempts after *X* failed ones, until the timeout of *Y* seconds runs out (*X* and *Y* are user-configurable).



8.6 Configuring System Features

In the *Configuration* page, select the *System* tab and go down to the section *Features*.



For each feature a brief description is provided.

Enabling/disabling a feature will require a reboot of the device, so that the corresponding service is started/stopped.

Note: Enabling ***Additional Data Sources*** will increase the number of data sources that can be configured from the default 48 to 96. When going back from 96 to 48 (by disabling the feature), all data sources above 48 will be lost.

8.7 Video Configuration Concepts

In the *Configuration* page, there are multiple tabs for configuring the device. In this section, we will revise those pertaining to the video aspect of the ION-R300. Here is a quick overview before we go into details for each tab.

- Data Sources
- On-Screen Displays
- Views
- Video Out

Data Sources represent connections to external devices or cameras. Several types of connections are available: video streams over RTSP, passive RTP and HTTP as well as web pages. The ION-R300 supports up to 48 separate data sources.

On-Screen Displays (OSD) determine the information you want to display over video streams and how to display that information. For example, when displaying a video stream, you might want to display the camera name and current time over the video. The ION-R300 supports up to 48 separate OSD configurations.

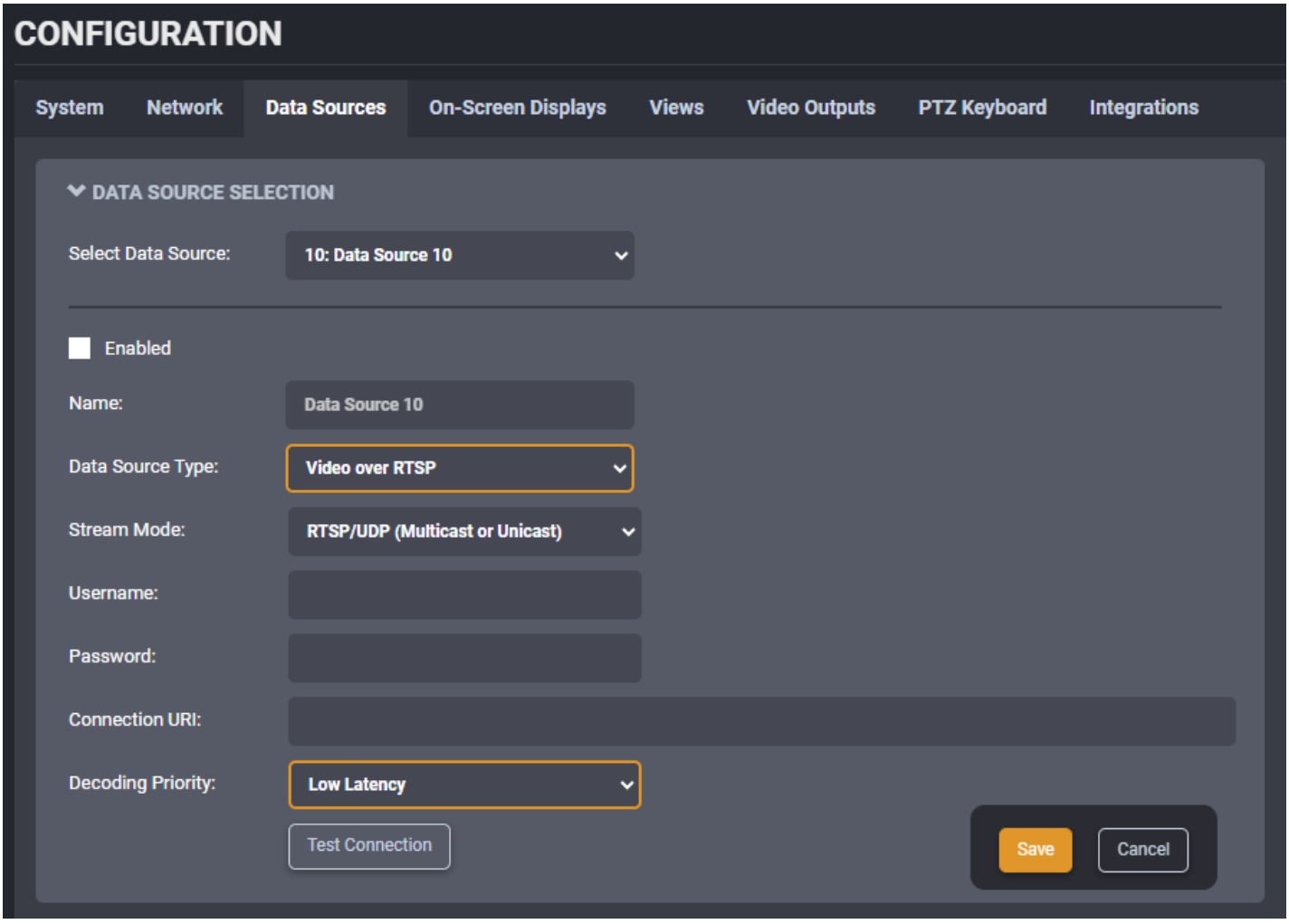
Views determine how you want to group and display data. For example, if you wanted to display video from all the building entrances on one screen in a 2x2 layout, you could configure a view with that layout. The ION-R300 supports up to 8 separate views.

Finally, *Video Outputs* contain the configuration specific to each TV or monitor connected to the ION-R300, like the display resolution or orientation for example. The ION-R300 supports up to three display outputs.

8.8 Configuring Video Connections

8.8.1 Video over RTSP Data Sources

In the *Configuration* page, select the *Data Sources* tab. After that, select the data source you want to configure from the drop-down list. To configure an RTSP video connection, set *Data Source Type* to *Video over RTSP*.



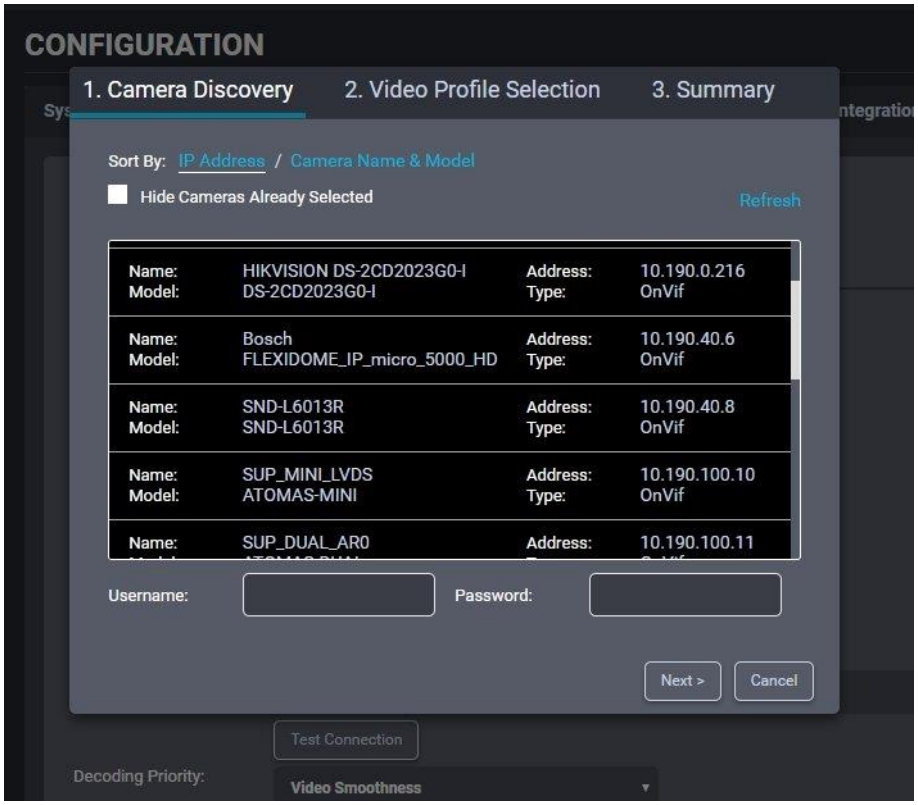
To connect to a video stream, the ION-R300 needs the **Connection URI** and **Stream Mode**, as well as any **Username** and **Password** required by the camera or encoder. This data source type is suggested If you know the exact connection URI of the video stream.

8.8.1 Video over Onvif/RTSP Data Sources

If you don't know the connection URI of the video stream, you can set *Data Source Type* to *Video over Onvif/RTSP* and click on *Configure Data Source Using Discovery Wizard*. The discovery wizard guides you through a few simple steps to fill the data source configuration for you.

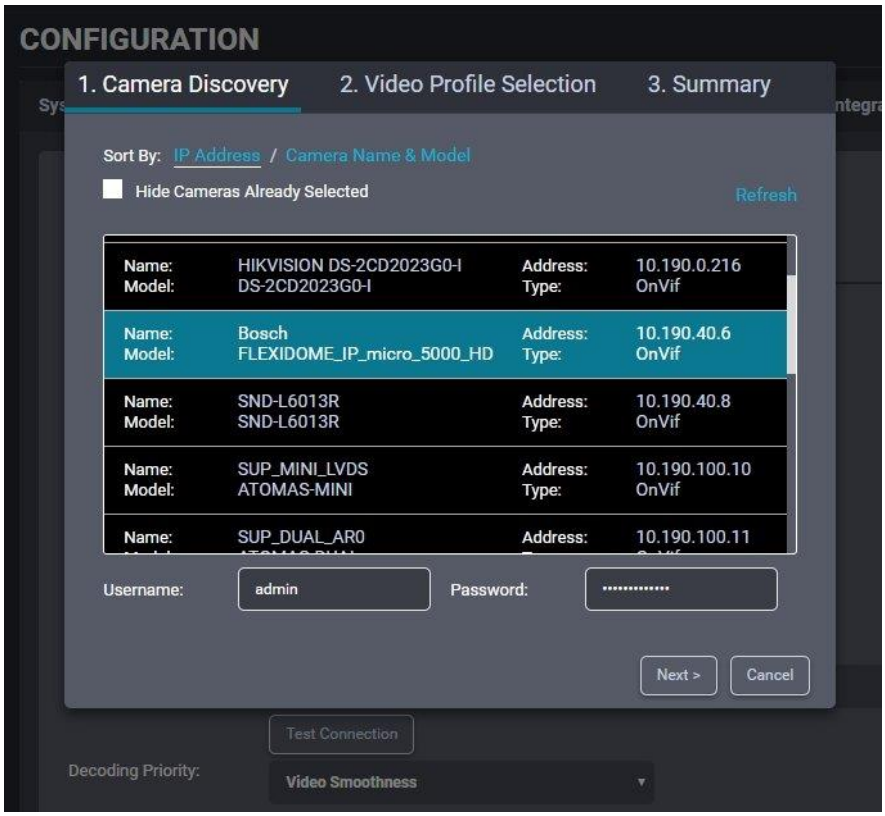
Step 1 – Camera Discovery

The wizard displays a list of all cameras and encoders discovered on the network. If the camera you are looking for does not appear in the list, make sure the camera is connected to the network and press *Refresh*.



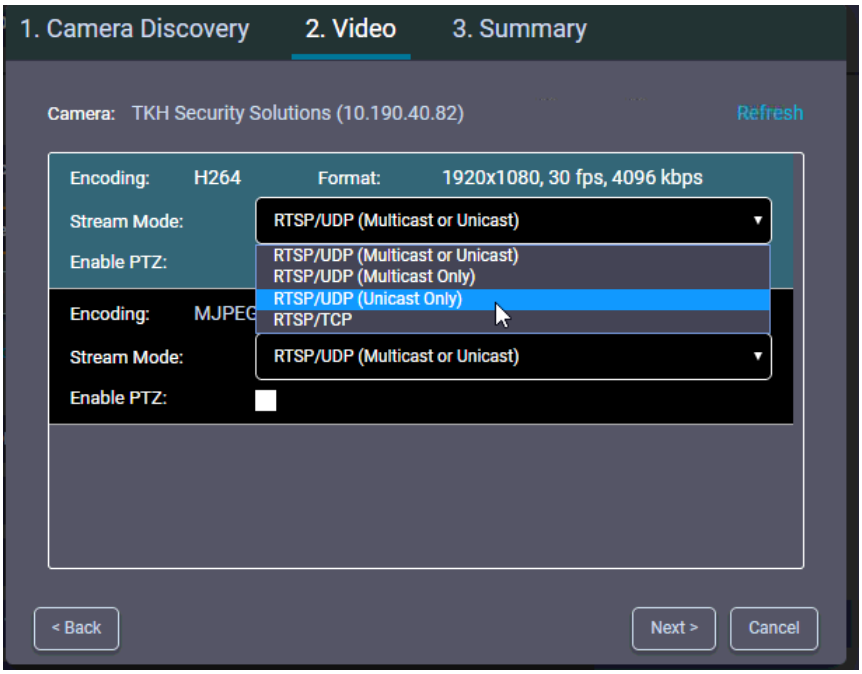
Step 2 – Camera Selection

Select the camera you want by clicking on the desired entry in the list. Then, enter the *Username* and *Password* of Onvif credentials required to connect to the camera. Press the *Next* button.



Step 3 – Video Profile Selection

In this step, the wizard displays a list of all video streams available from the camera that are supported by the ION-R300. Click on the desired video stream. The ***Stream Mode*** field shows a list of network connection types supported by the camera. Select the desired streaming mode and press ***Next***. You can also check ***Enable PTZ*** to have access to PTZ controls when viewing video from the camera.

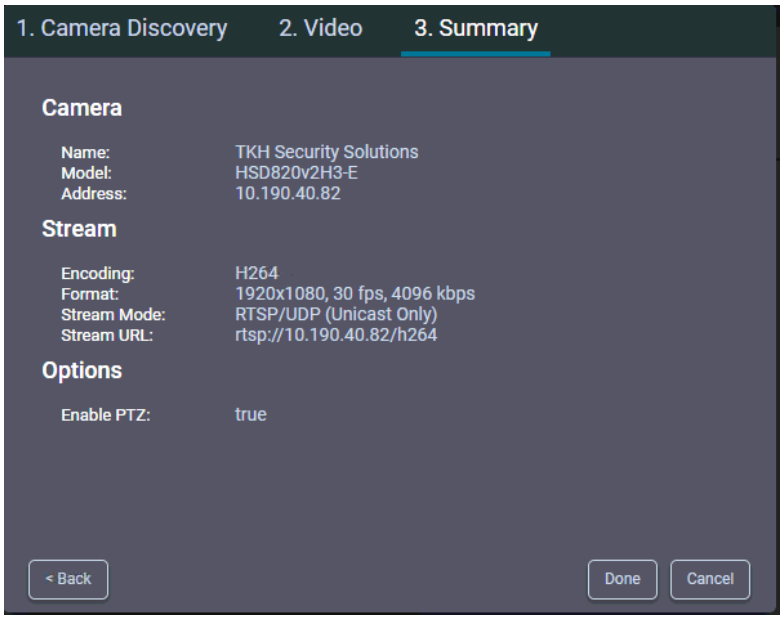


Note: If you entered a wrong username or password in the previous step, the wizard displays a warning indicating that it can't retrieve the video profiles. In this case, press the ***Back*** button to go back and enter the correct username and password.

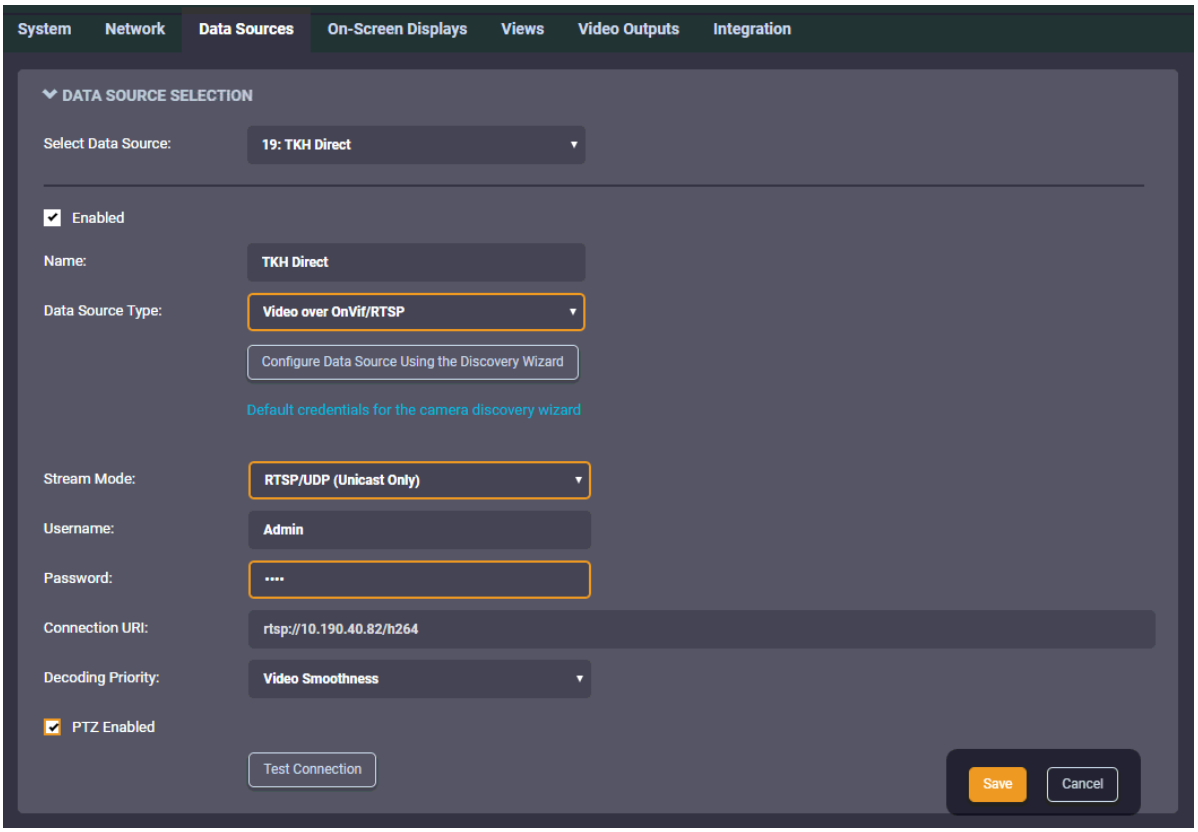
Note: You will not see the option ***Enable PTZ*** if the camera doesn't support it over ONVIF.

Step 4 – Summary

Here the wizard displays the details of the video stream you have selected. To confirm that this is the video stream you want, click on ***Done***. The wizard then closes, and the data source configuration is automatically populated.



To finalize the data source configuration, type in a name (optional) for the data source and press ***Save*** at the bottom to save the new configuration.



Note: The ION-R300 connects to a video stream ONLY when that stream is displayed. Enabling a data source indicates that the ION-R300 can establish this connection when needed, not that it needs to do so right away. Disabling a data source prevents the ION-R300 from connecting to the video stream altogether.

Note: A video data source creates a single connection. Even if the video is played on two different outputs at the same time, the video stream is captured only once.

8.8.2 Testing a connection

Once the data source is fully configured and saved, press the ***Test Connection*** button to test the connection.

Possible results are:

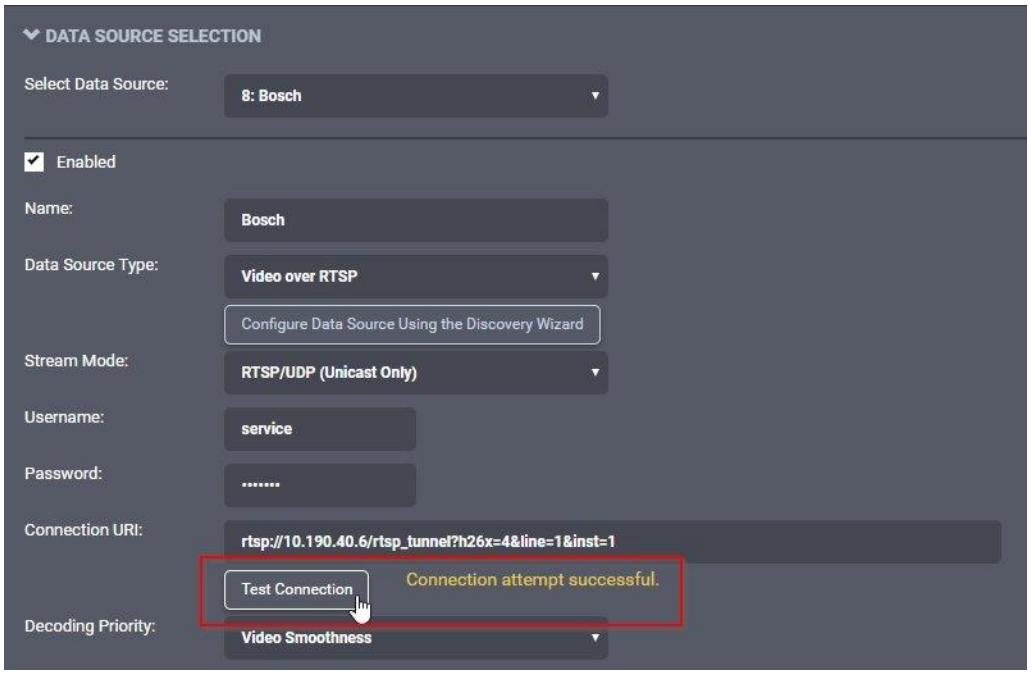
- **Connection attempt successful.**
  No error was reported while testing the connection.

- **Connection attempt timed out.**
  Tried to connect to the camera but got no answer. The camera may be temporarily offline, else it is unreachable.

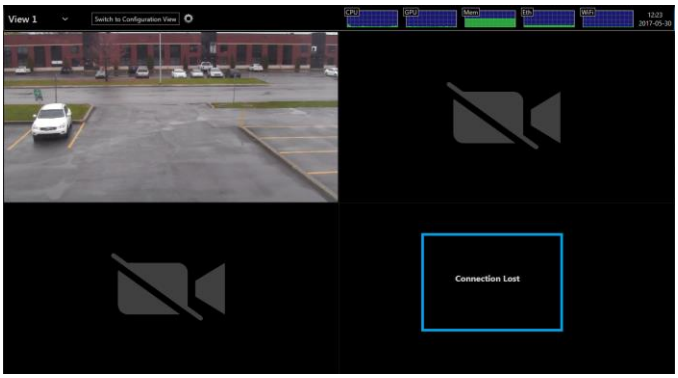
- **Connection attempt refused by remote.**
  The connection to the camera was established, but the camera refused the username/password provided.

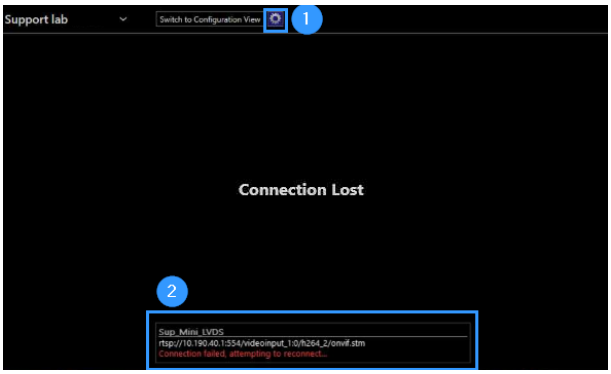
- **Connection established, but unable to start video stream.**
  The connection to the camera was established, but the video stream could not be started. The connection URI may not point to a valid video stream in the camera. This can also occur if the camera has reached a connection or streaming limit due to other third-party connections.

- **Invalid connection URI or internal error, connection attempt impossible.**
  The connection URI is malformed or incomplete.



Note: Connection testing is only available for *Video over RTSP* and *Video over HTTP* data sources.



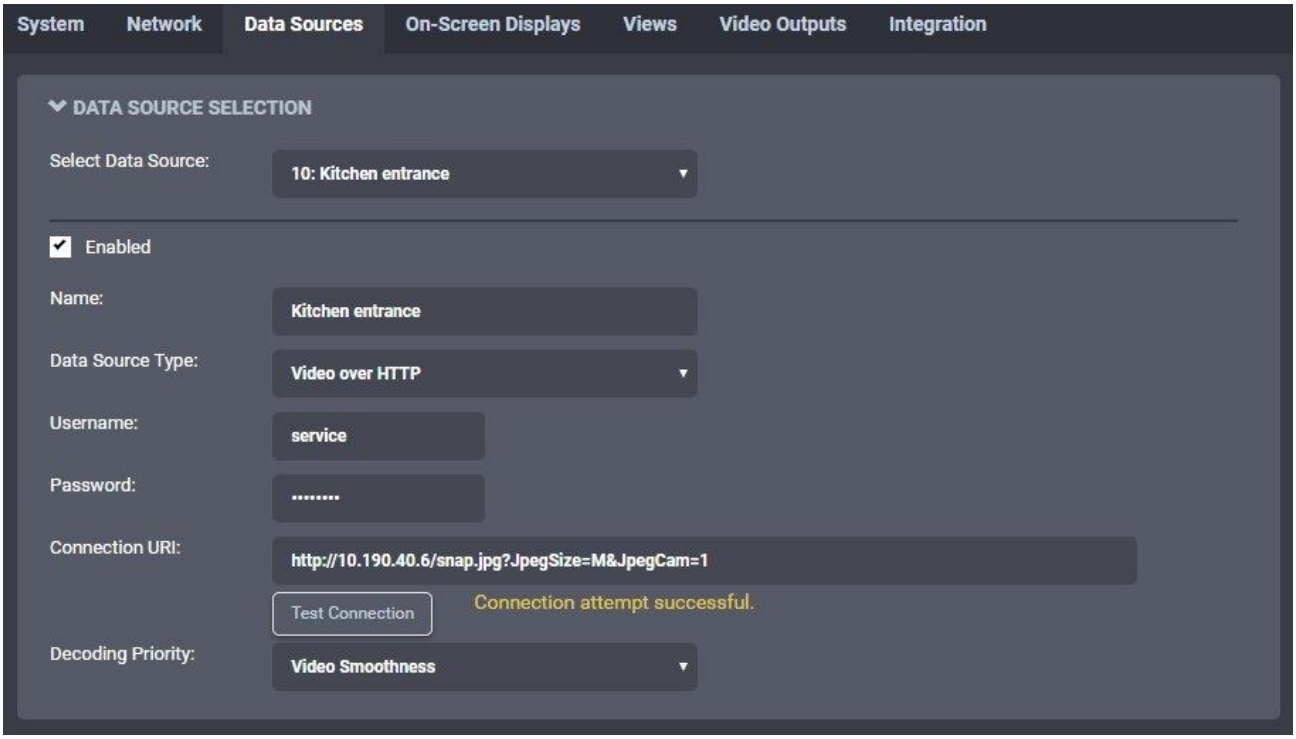


Note: For security reasons, any time an invalid URI is configured in a Data Source or loss of a video stream occurs for any other reason (i.e. camera defect, network issues, etc.) a Connection Lost caption will appear for that Data Source as depicted in the screenshots above. No connection information, such as IP address or other URI parameters will be displayed. The screenshot on the right shows that you can display this information by activating the stream details by clicking on the button at the top of the screen when a mouse is directly connected to the ION-R300.

8.8.3 Video over HTTP Data Sources

To configure an MJPEG over HTTP video connection, set *Data Source Type* to *Video over HTTP*. There is no standardized method to query the list of available HTTP video streams in a camera and thus the discovery

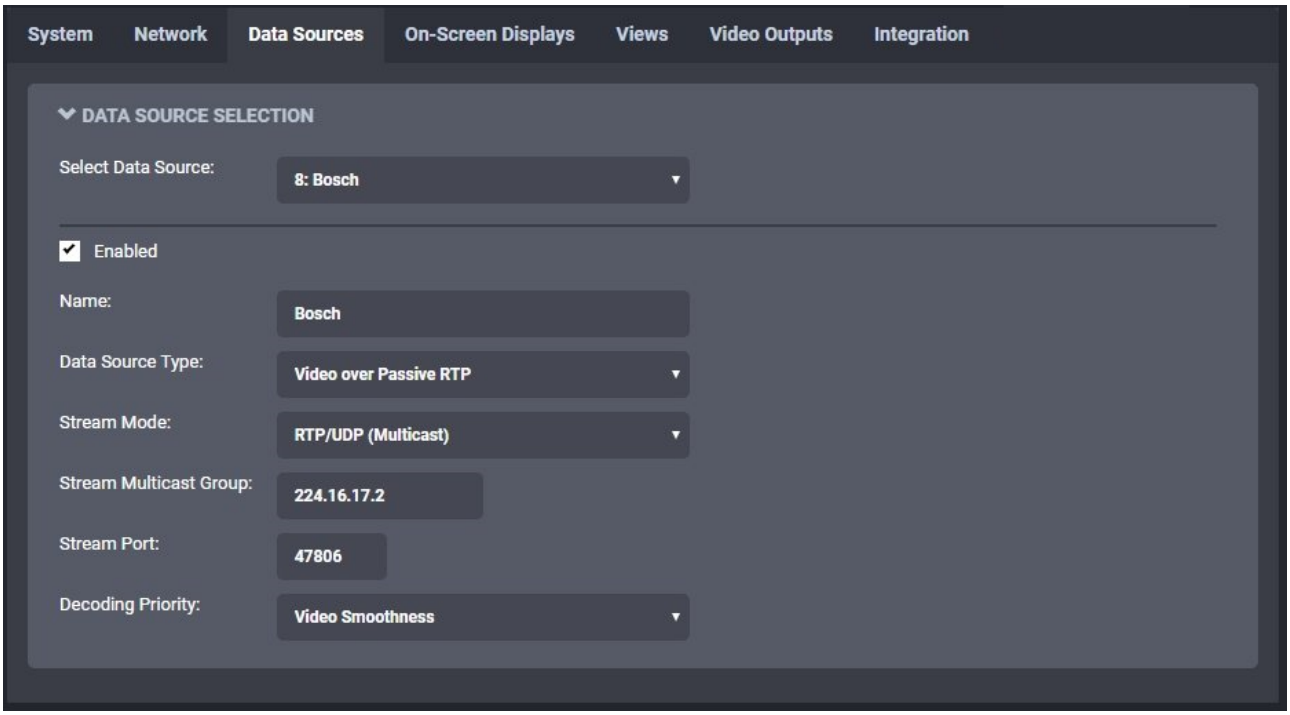
wizard cannot be used to configure the data source. You must enter the *Connection URI* as well as any *Username* and *Password* required by the camera. If you do not know the *Connection URI* to use, see your camera documentation or contact the camera manufacturer.



8.8.4 Video over Passive RTP Data Sources

Some video systems transmit video over passive connections. In this mode, the camera just sends the video to a fixed IP address or multicast group address without knowing if there is somebody to receive the video.

To configure a passive video connection, set *Data Source Type* to *Video over Passive RTP*, and then set the *Stream Mode* and *Stream Port* to match the passive video stream. If the passive video is sent to a multicast group, you must also enter the *Stream Multicast Group*. If the passive video is sent using SSM (Source-Specific Multicast), you must enter the *Stream Multicast Group* and *Stream Source*.

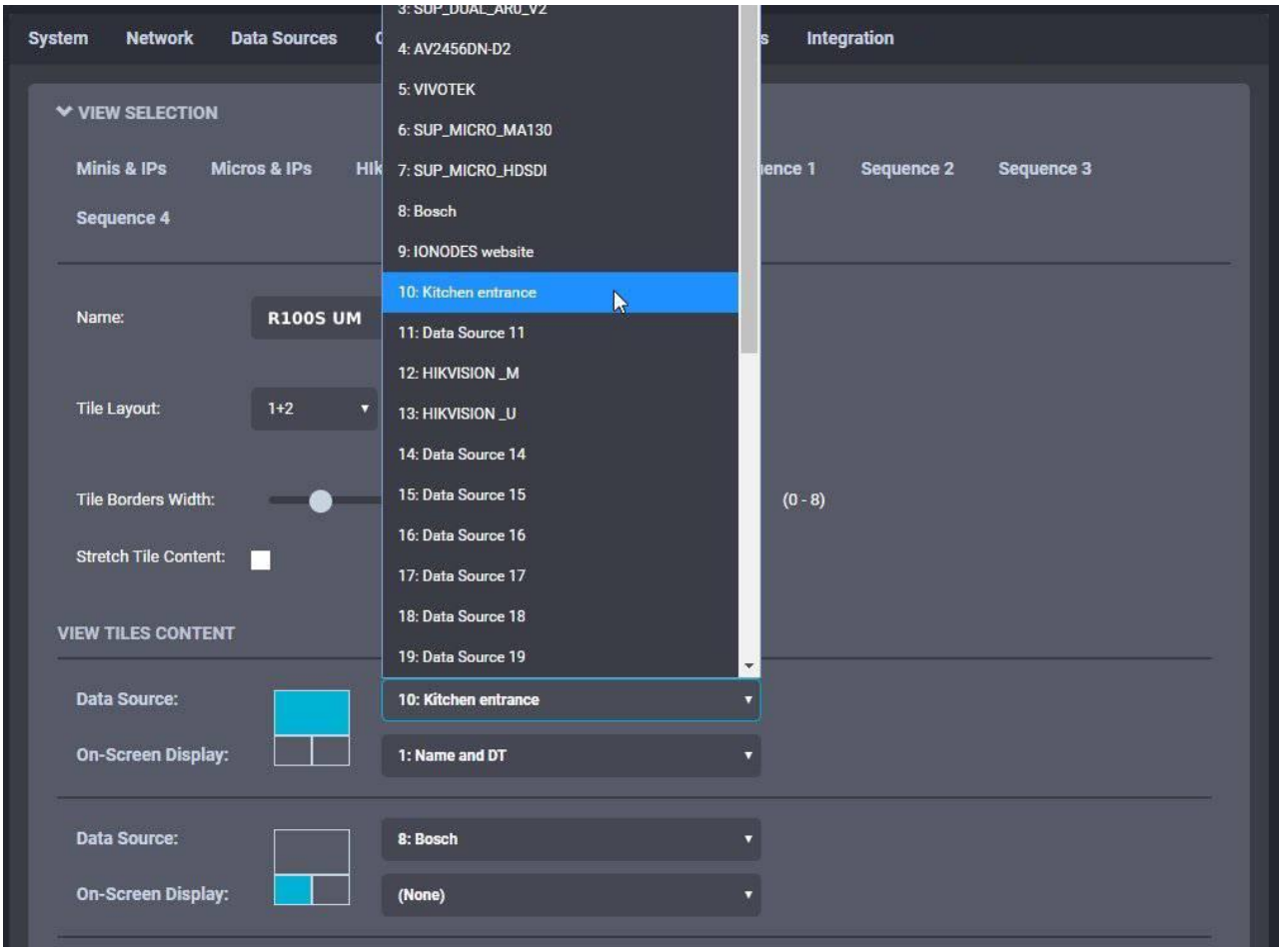


8.8.5 Displaying a Data Source

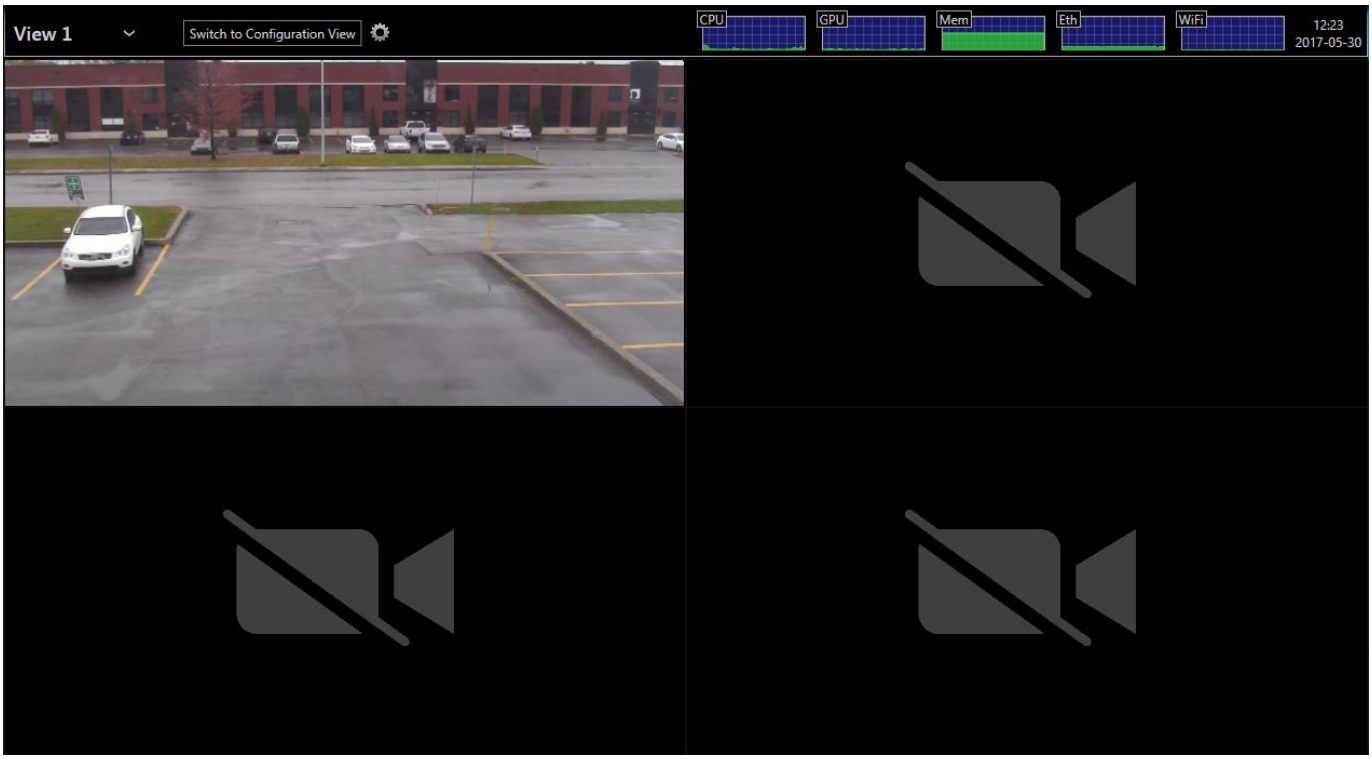
Now that we have configured an RTSP video data source, the next step is to display it. In the *Configuration* page, select *Views* tab.

Views determine how data sources are grouped and displayed. For example, by default each view displays up to 4 data sources in a 2x2 layout. How to configure views will be discussed in full details in section 8.12. For now, scroll down to the *View Tiles Content* section. Each tile is identified by its position in the currently selected layout.

For the top left tile, click on the *Data Source* field and select our newly configured video data source. Click on *Save* at the bottom to apply the change.



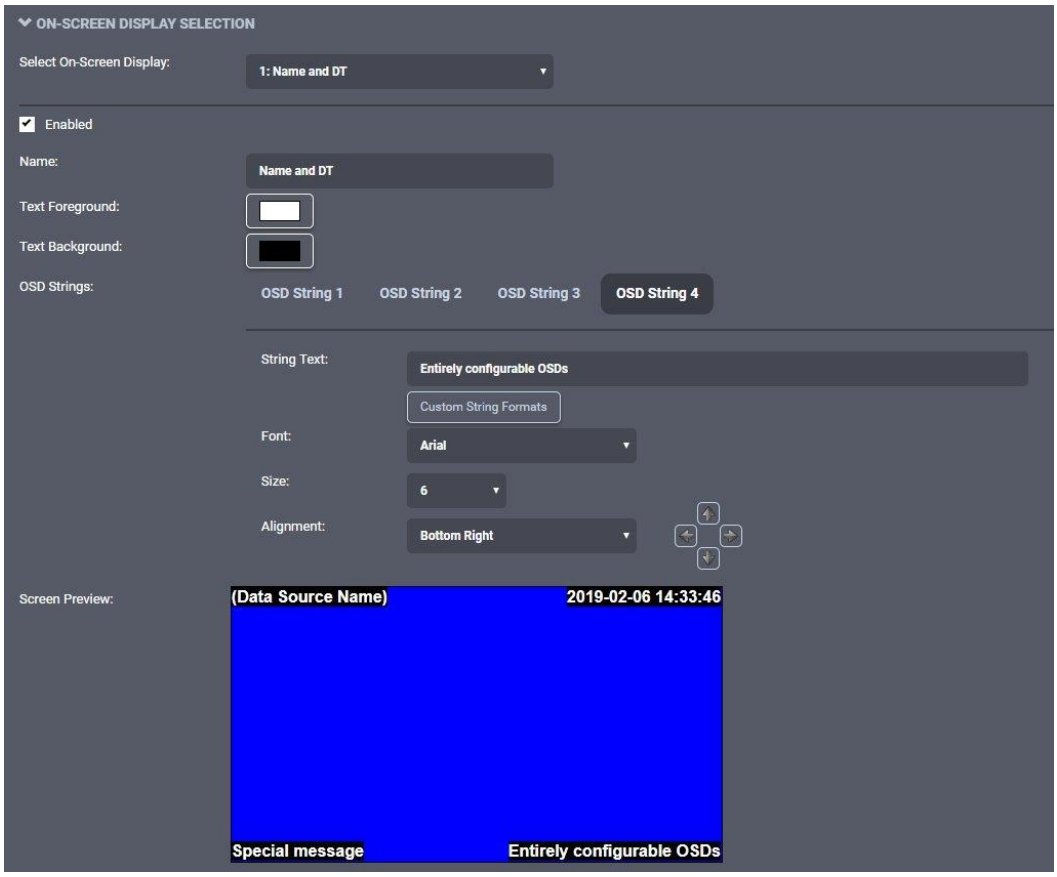
If you are configuring the ION-R300 from your computer through the device's web interface, the video is now displayed. If you are configuring the ION-R300 locally, click on ***Switch to Display View*** at the top of the screen to view the video.



8.8.6 On-Screen Displays

In the *Configuration* page, select *On-Screen Displays* tab.

Screen Preview is a visual representation of the area where the OSD will be displayed. As you configure the OSD, the preview will be automatically updated. Each OSD can display up to 4 strings of text, located as you wish over the video.

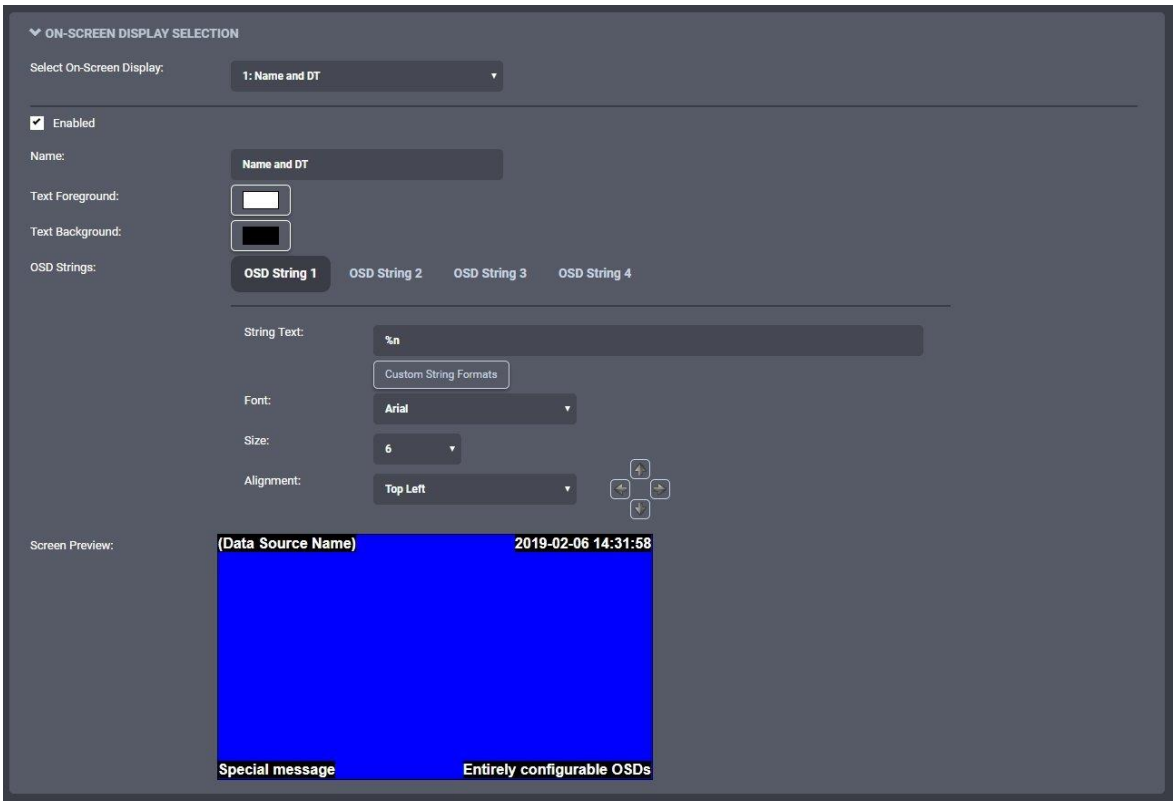


Click on *Text Foreground* to select the color of the OSD text. In the same fashion, click on *Text Background* to select the background color for the OSD text.

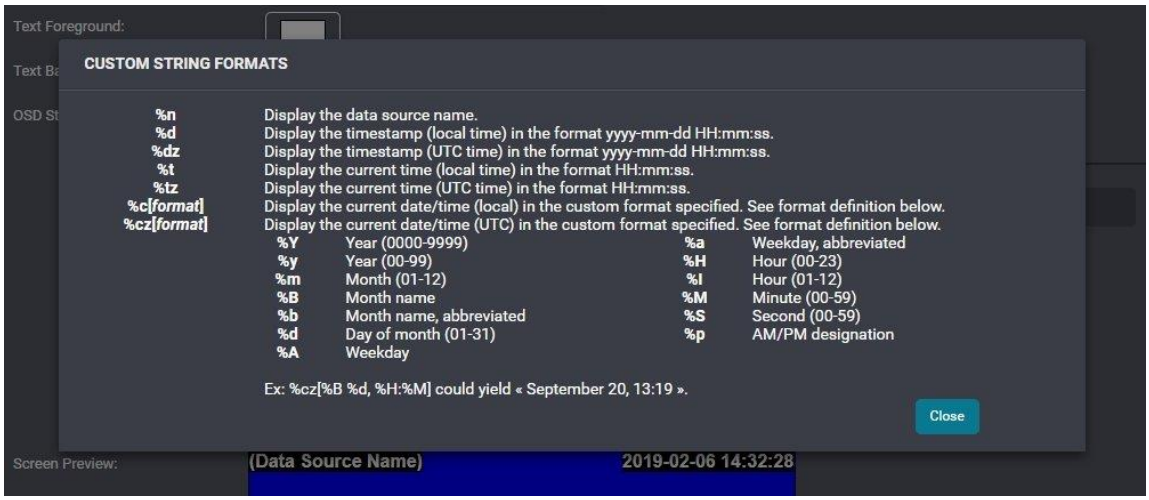
Above the preview is where you configure each OSD string. Click on the *OSD String 1* to configure the first OSD string. In *String Text*, type in the text to display. Select the desired *Font*, you have a choice of either Arial (used throughout this manual) or Impact. *Text Size* lets you select how big to display the text. Finally, *Alignment* lets you select where to anchor the text (ex: top left corner). Use the *Offset* arrows if you want to move the text around that anchor.

To configure other OSD strings, click on *2*, *3* or *4* and set the appropriate text, alignment, and size.

Note: The ION-R300 provides a wide range of possible text sizes to ensure readability on a wide variety of display sizes with resolutions from HD-720 all the way to 4K.



The ION-R300 supports a list of custom OSD strings to display dynamic information (ex: the camera name or the current time). Click on *Custom String Formats* to see the complete list.

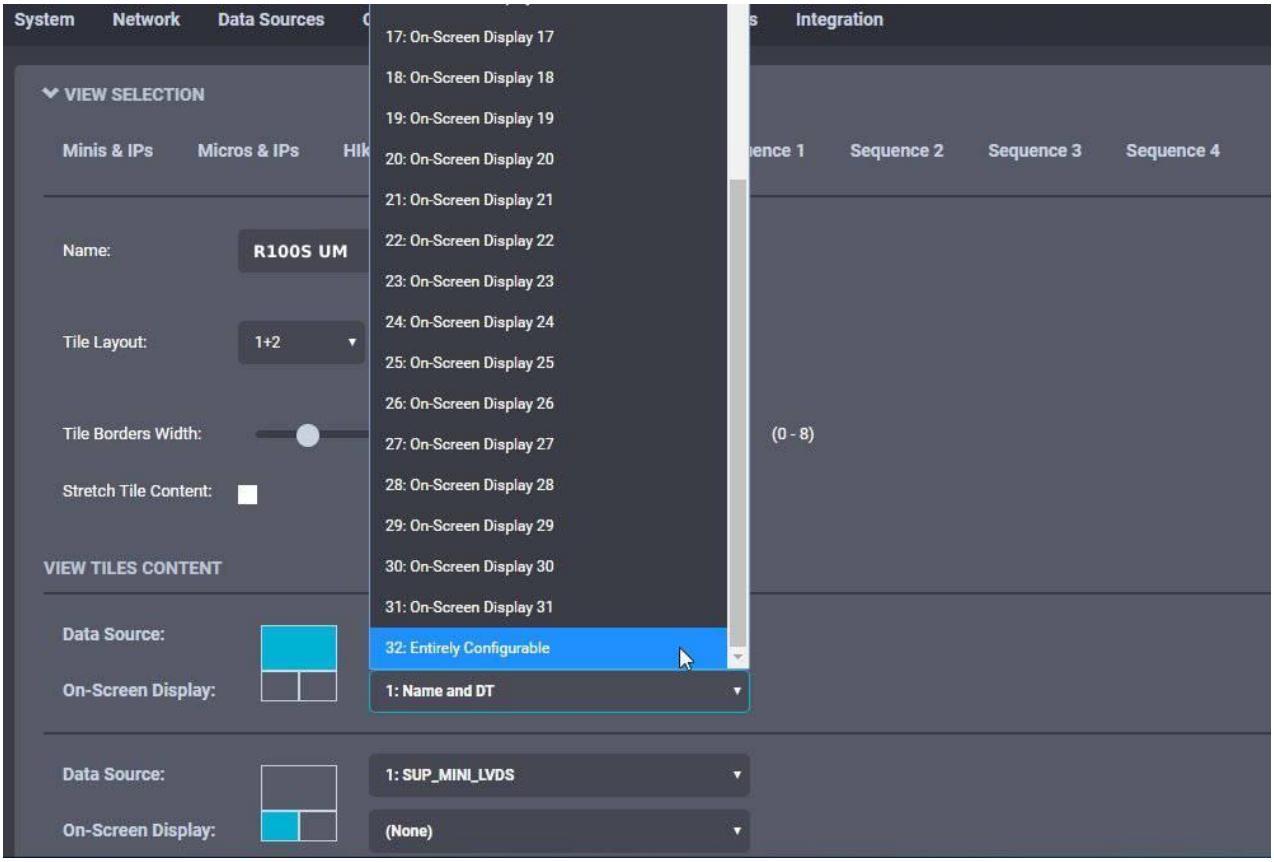


Note: Using custom OSD strings allows for greater flexibility. For example, displaying "Parking Lot" in your OSD makes sense only for the camera pointed at the parking lot. Instead, using "%n" (data source name) allows creating one OSD and displaying it over all your video streams.

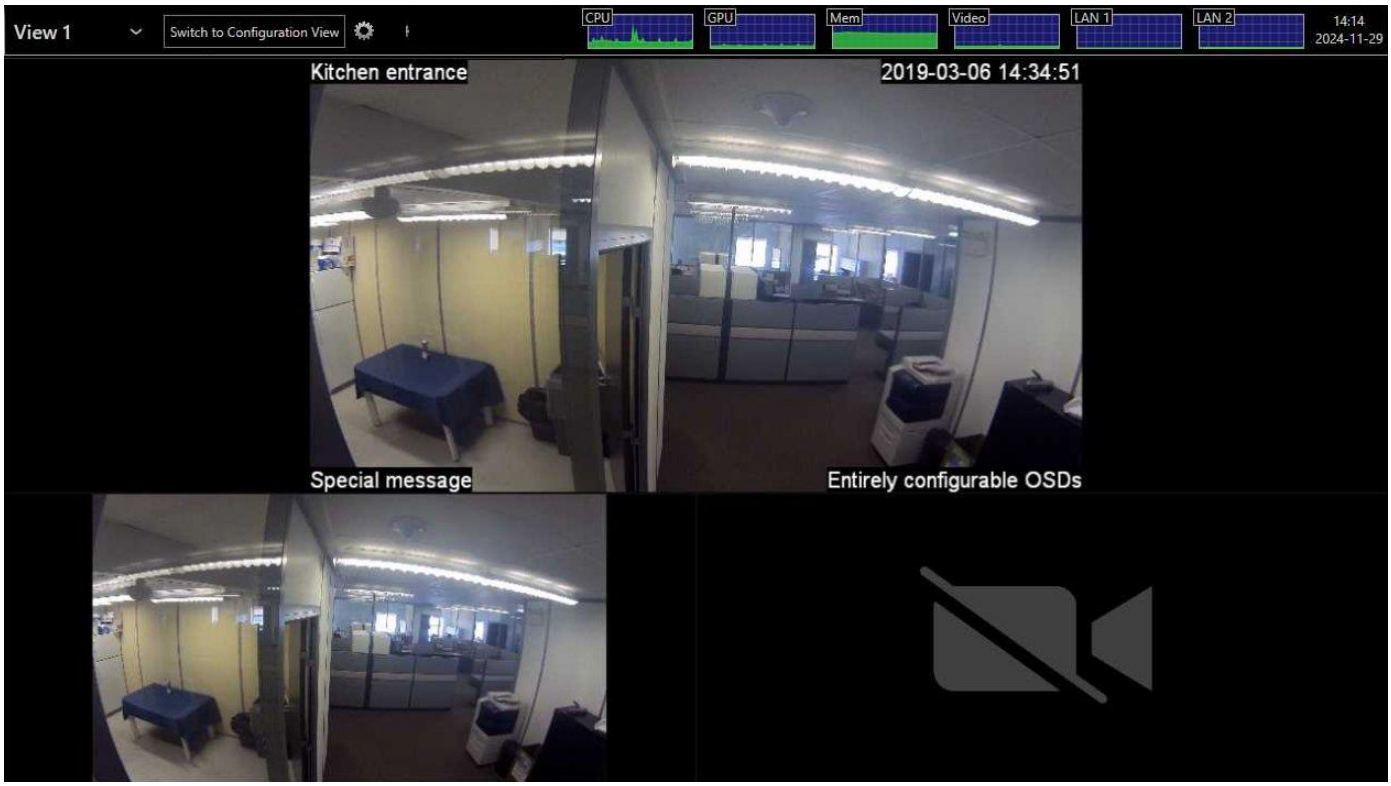
8.8.7 Displaying an On-Screen Display

In the *Configuration* page, select the *Views* tab. Scroll down to the *Tile Selection* section.

For the top left tile, click on the *On-Screen Display* field and select our newly configured OSD. Click on *Save* at the bottom to apply the change.



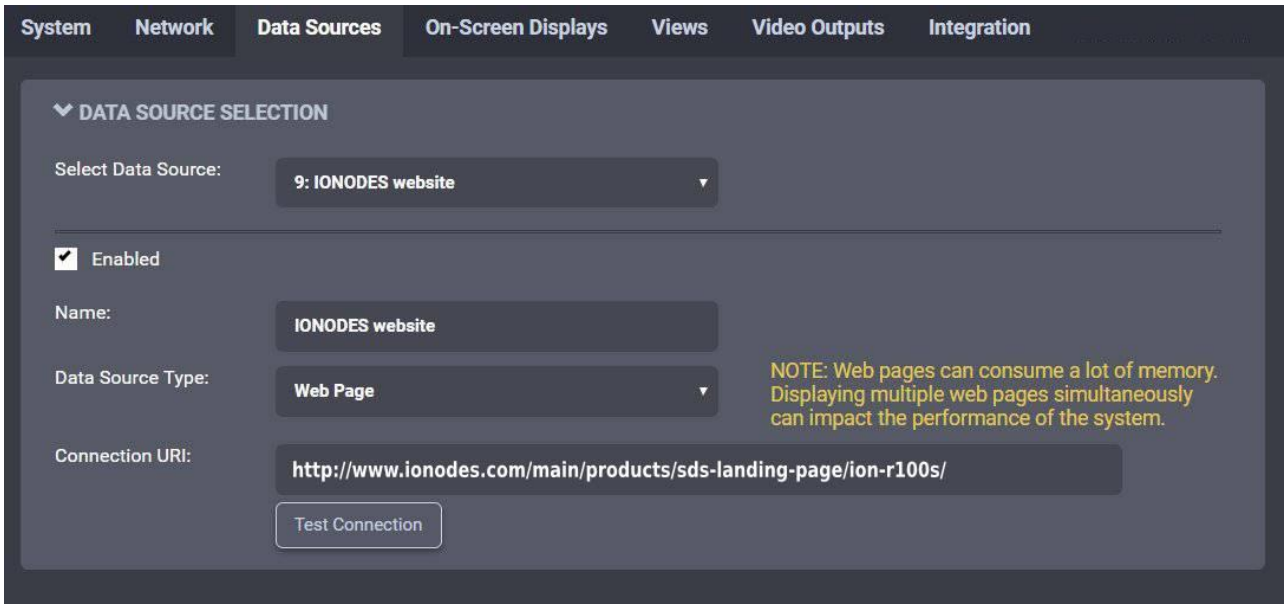
If you are configuring the ION-R300 from your computer through the device's web interface, the OSD is now displayed over the video. If you are configuring the ION-R300 locally, click on *Switch to Display View* at the top of the screen.



8.9 Configuring Web Connections

In the ***Configuration*** page, select the ***Video Out*** tab, then the ***Data Sources*** sub-tab. After that, select an unused data source to configure. To configure a web connection, set ***Data Source Type*** to *Web Page*.

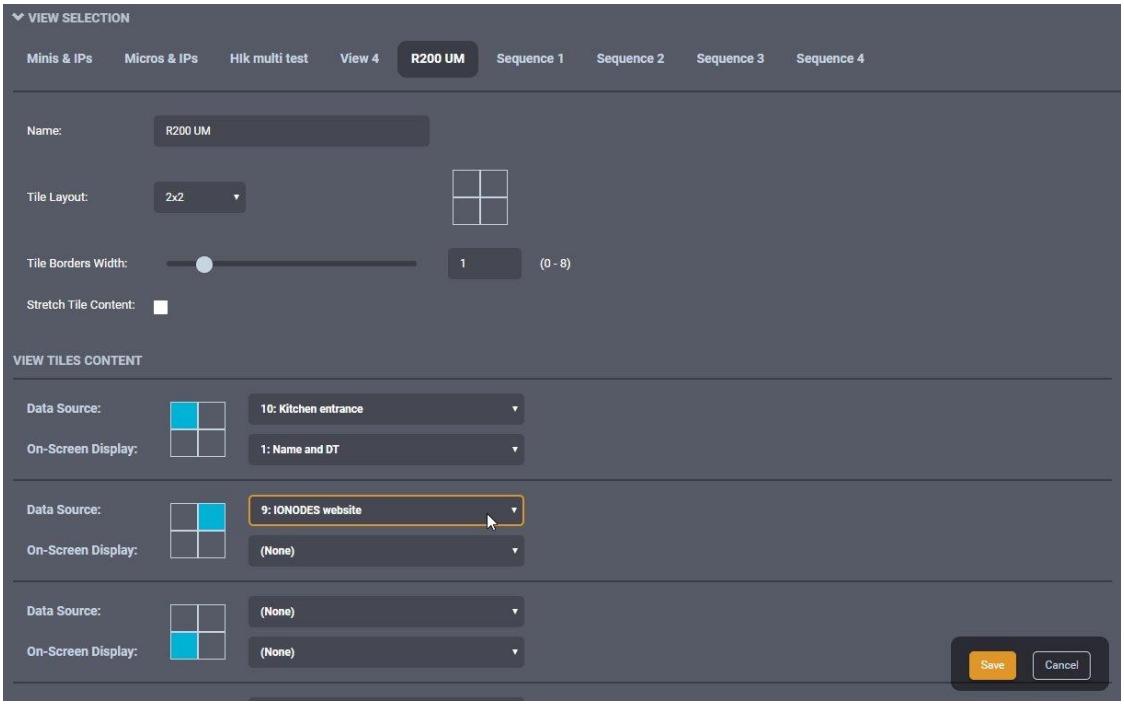
Type in the address of the web page in ***Connection URL***. Type in a name (optional) for the data source, check ***Enabled*** to enable this data source and press ***Save*** at the bottom to save the new configuration.

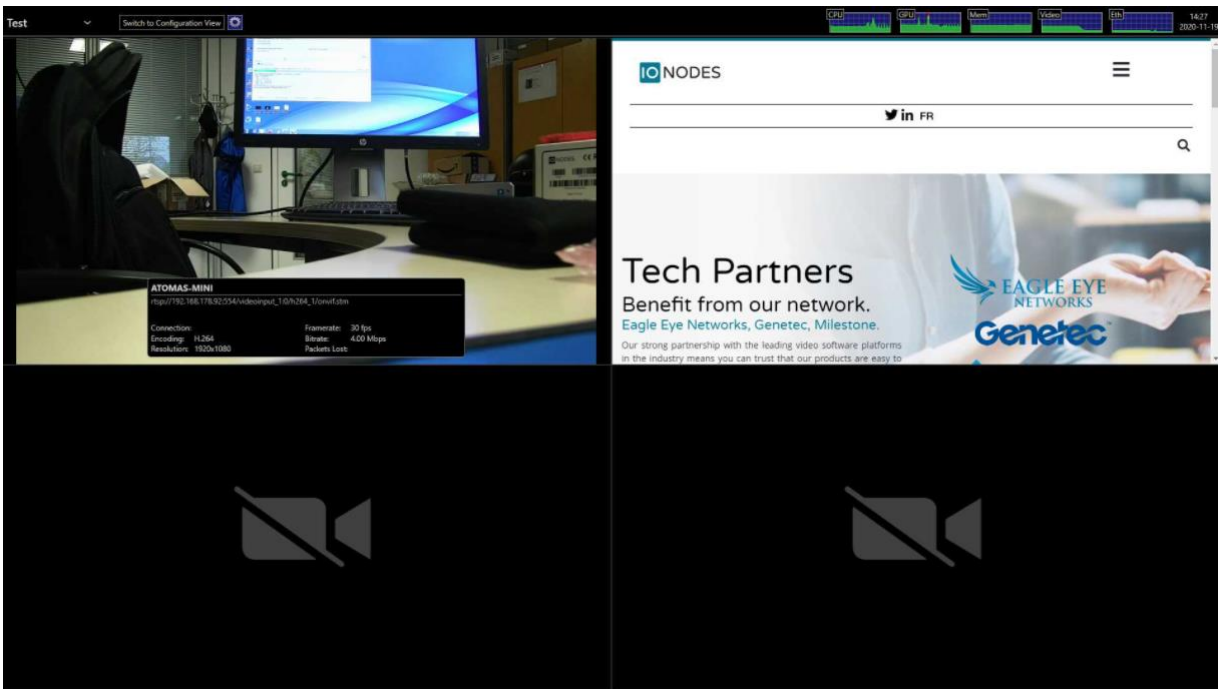


Note: The ION-R300 connects to a web page ONLY when that web page is displayed. Enabling a data source indicates that the ION-R300 can establish this connection when needed, not that it needs to do so right away. Disabling a data source prevents the ION-R300 from connecting to the web page for any reason.

To display the web page, we need to add it to a view. In the ***Configuration*** page, select the ***Views*** tab. Scroll down to the ***View Tiles Content*** section.

For the top right tile, click on the ***Data Source*** field and select our newly configured web page data source. Click on ***Save*** at the bottom to apply the change.



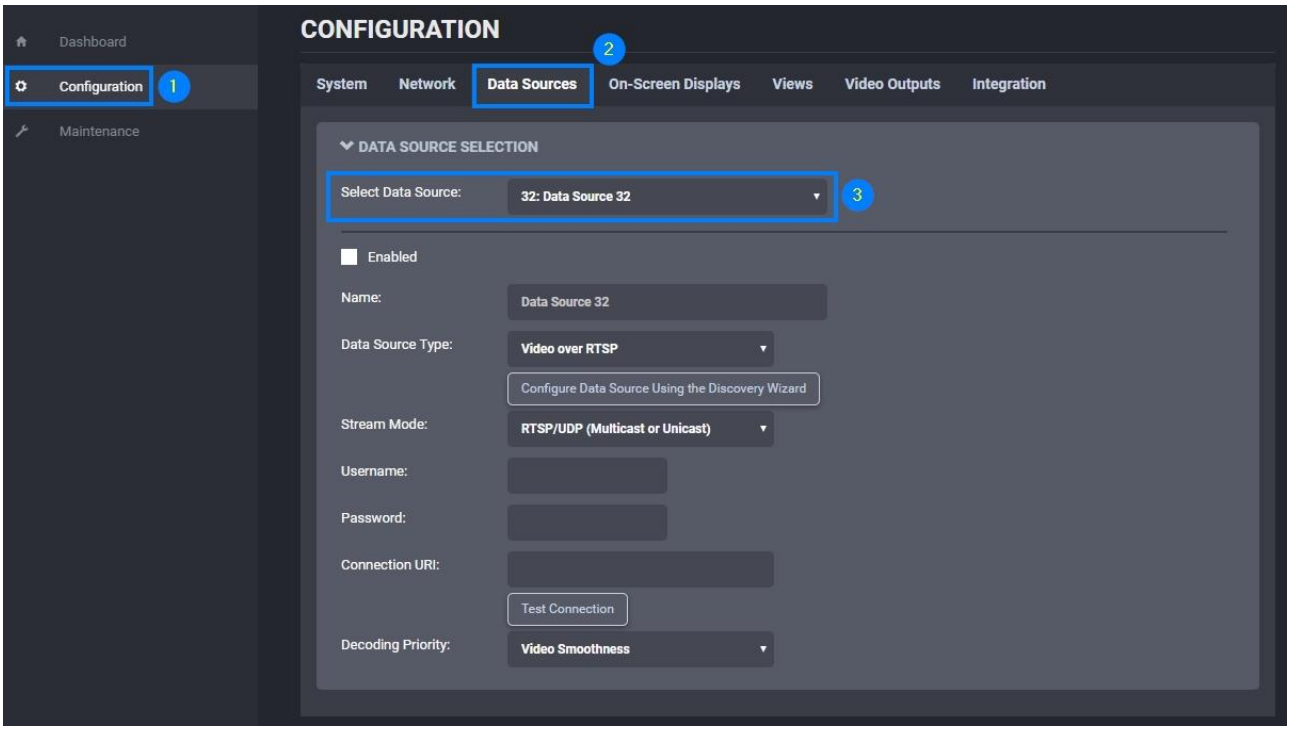


Warning: Modern web pages are often filled with highly dynamic media content. Displaying such content requires a lot of resources. Displaying multiple web pages WILL affect the video decoding performance of the ION-R300.

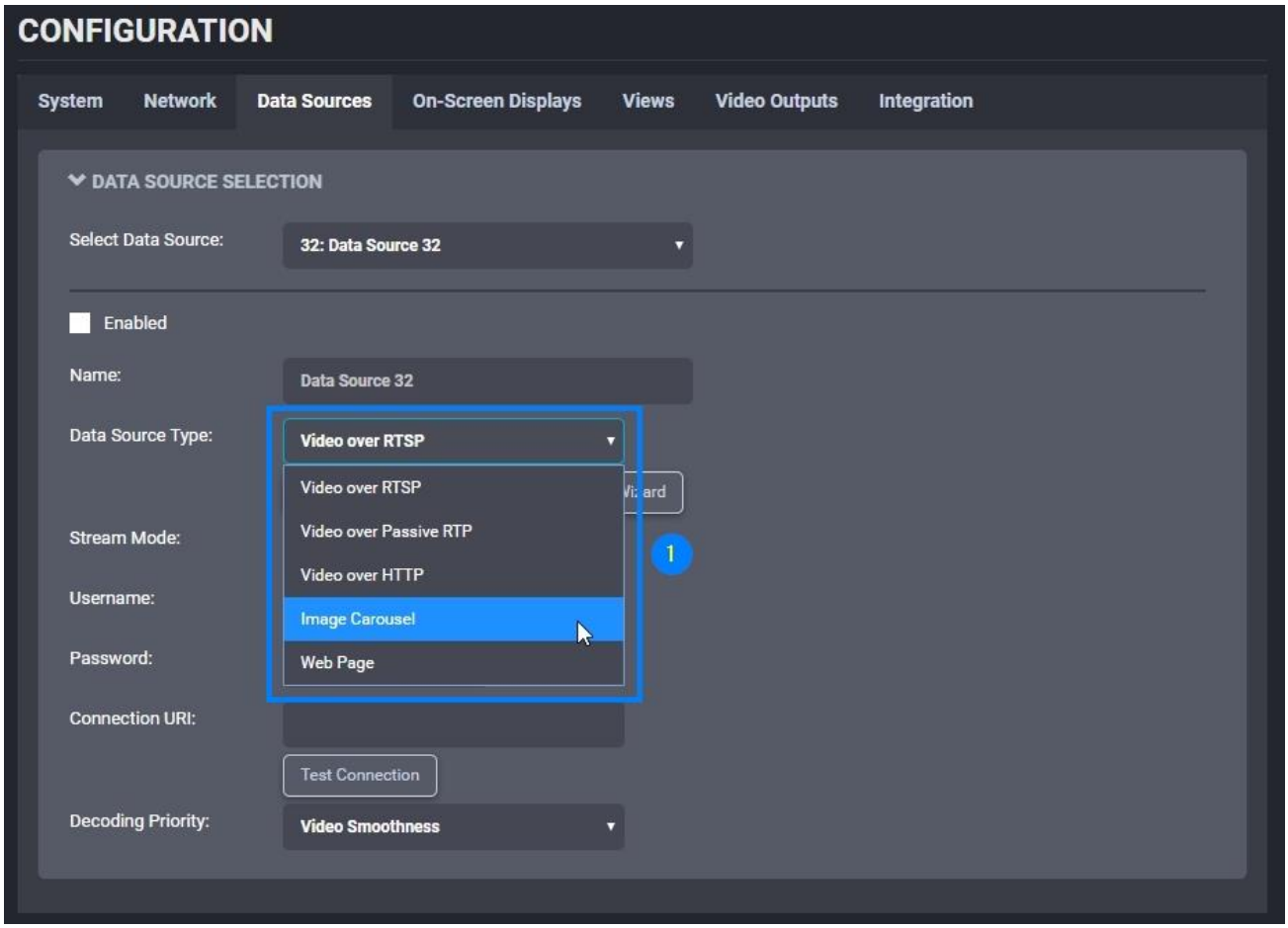
8.10 Image Carousel

The IONODES Secure Display Station allows you to program a fully configurable image carousel as a data source that can be displayed on a video output tile of your choosing.

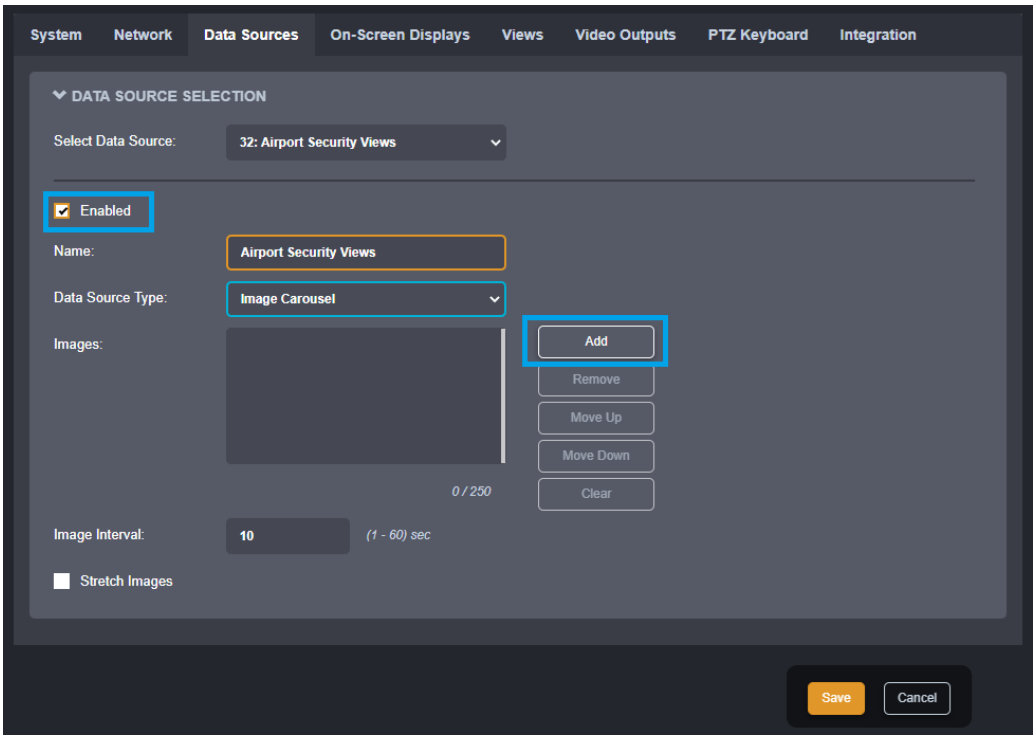
1- Select the *Configuration* page
2- Select the *Data Sources* tab
3- Select a data source to be configured in the *Data Source Selection* section

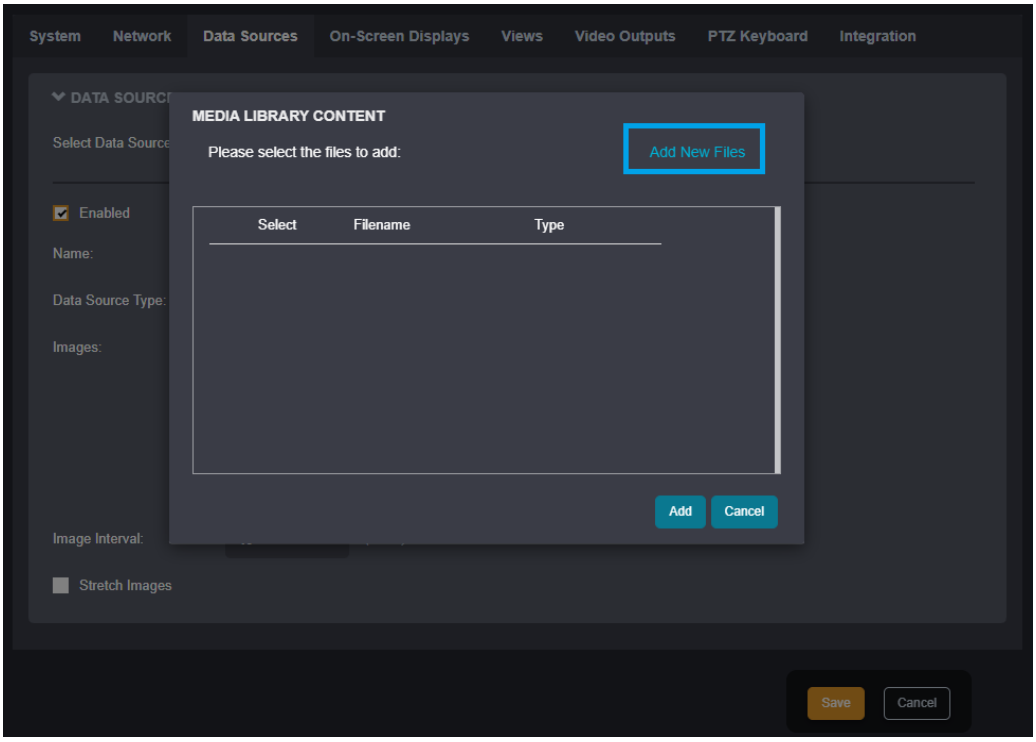


1- Select the *Data Source Type* as **Image Carousel**

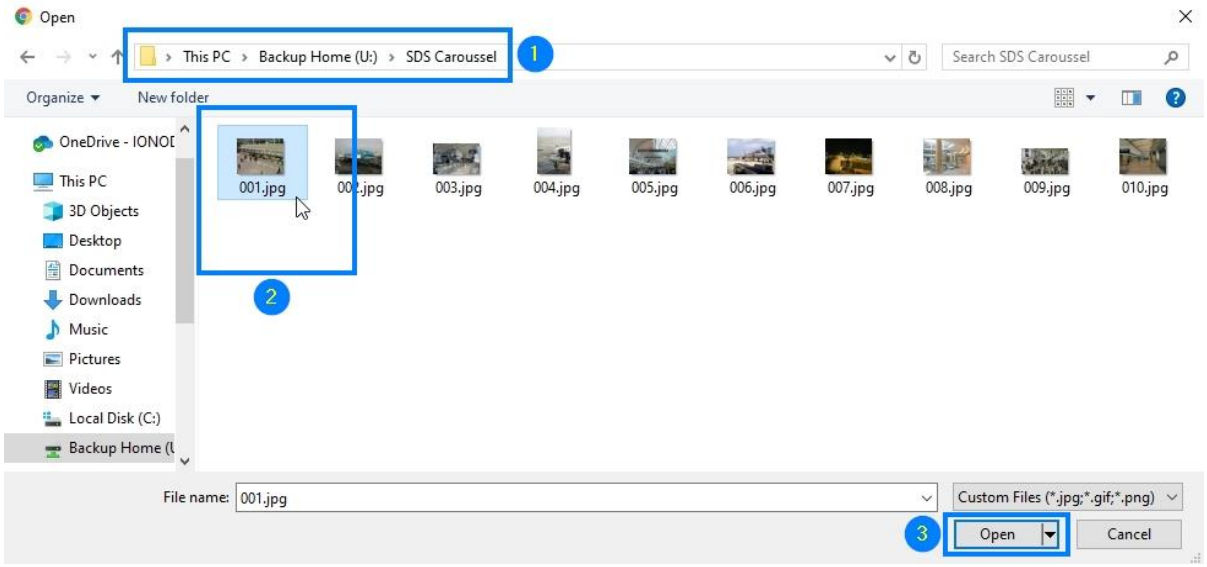


1- Enable the data source
2- Modify the ***Name*** field to a custom name or description
3- Click ***Add*** to open the Media Library dialog

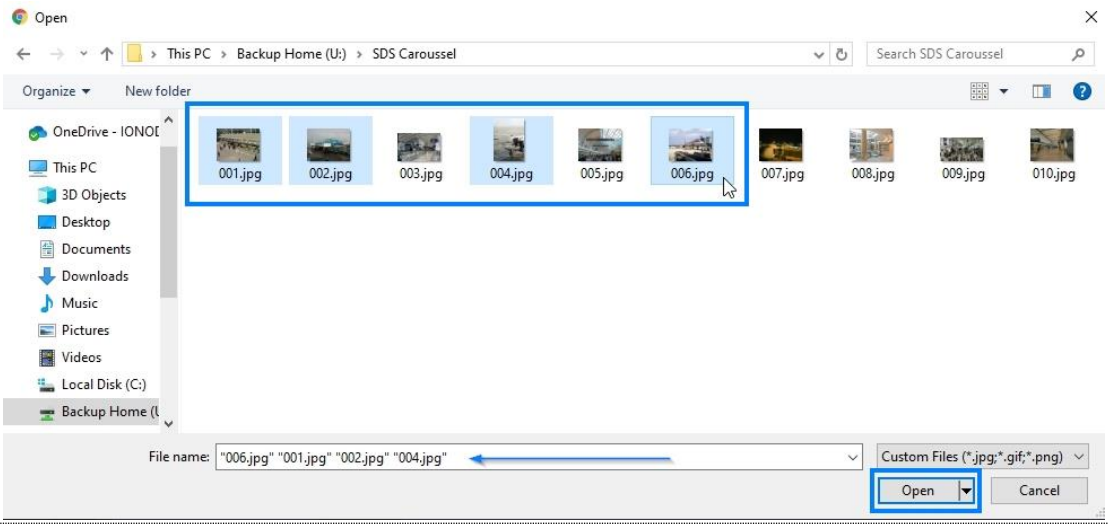




1- Click on ***Add New Files*** to open the File Explorer dialog
2- Navigate to the directory containing the image(s) to upload to the ION-R300
3- Select an image
4- Click ***Open*** to automatically upload it to the ION-R300 Image Carousel

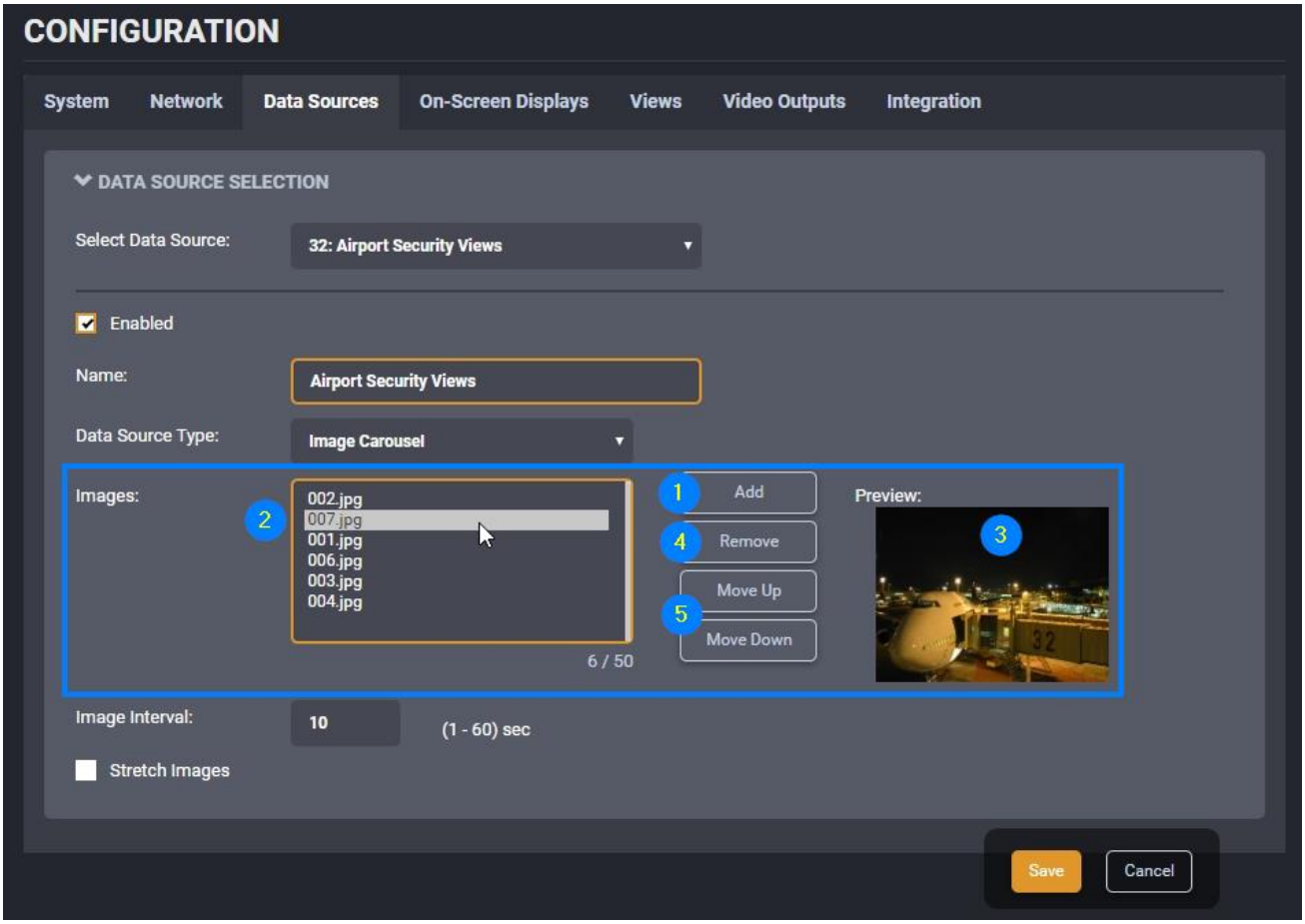


Note: Standard selection functions can be used in this step, such as holding the Ctrl key on the keyboard to select multiple images or selecting all images via the Ctrl-A keyboard shortcut, followed by the Open button to upload all selected images at once. If only a single image is to be uploaded, you may also double-click it to automatically upload it without clicking the Open button.



Several functions are available on the ION-R300 to manage the images once they have been uploaded.

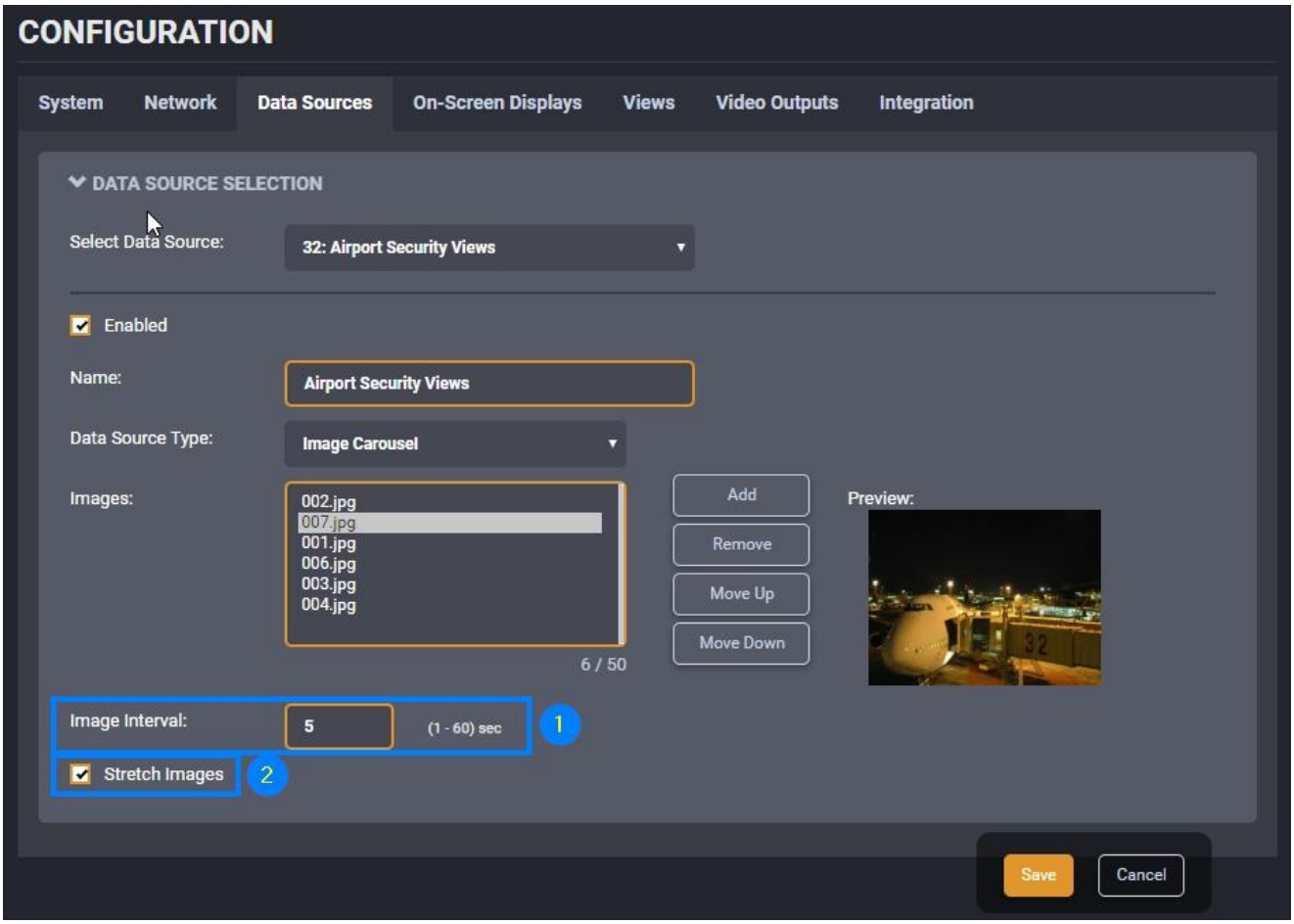
1- You may upload additional images by clicking on the ***Add*** button once again
2- Selecting an image in the image list, you can:
3- ***Preview*** the image
4- ***Remove*** (delete) the selected image
5- Re-order the selected image in the image list by clicking the ***Move Up*** or ***Move Down*** buttons



Note: A maximum of 50 images may be uploaded to the ION-R300 per data source. Images must be in JPG, PNG or GIF (not animated in ION-R300 video output) formats with a maximum size of 2 MB (2048 kb). GIF and PNG transparency is supported.

Note: All uploaded images can be managed through the Media Library.

1- Set the image interval for the images to be displayed
2- Select stretch if you want the images to be stretched full screen within the chosen video tile. Ensure to have proper image aspect ratio based on your screen resolution & tile size when activating this function.



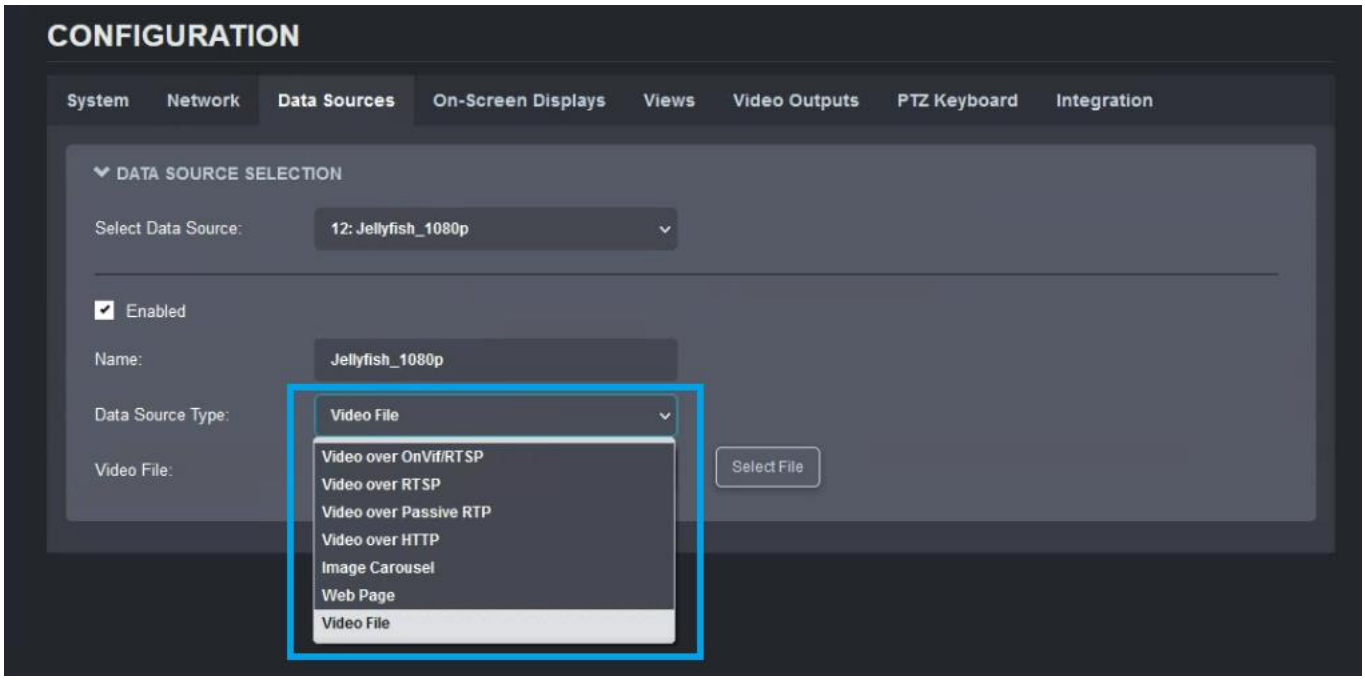
Note: When ***Stretch Images*** is checked, images will be stretched to fill the entire view tile, regardless of the images' aspect ratio. When unchecked, images will take as much space as possible in the view tile while preserving the images' aspect ratio.

8.11 Video file playback

Secure Display Stations allow the user to playback within a tile a selected video file stored on the internal memory of the device.

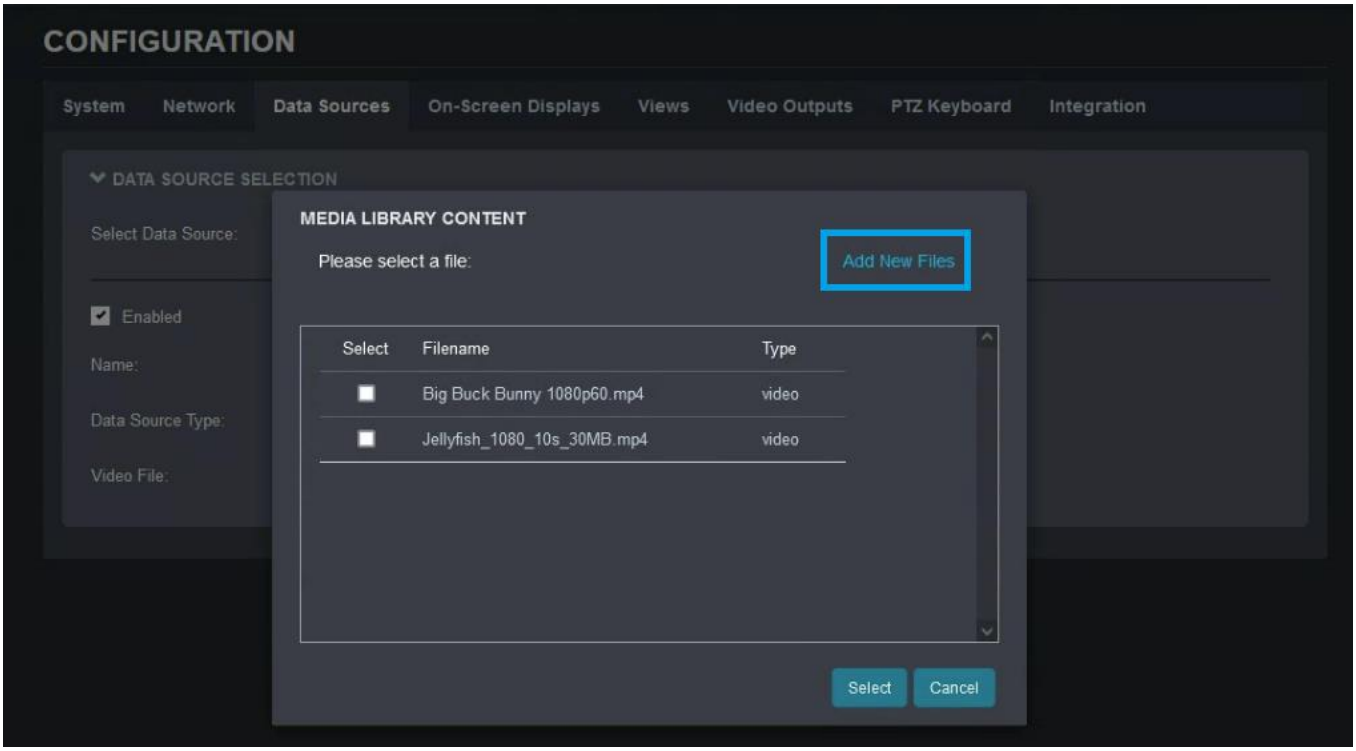
To access this function please follow these steps:

1- Select the Configuration page
2- Select the Data Sources tab
3- Select a data source to be configured in the Data Source Selection section
4- Set the Data Source Type to Video File



When selecting the video file, the user is presented with 2 options:

1- Select a file which is already uploaded to the media library of the Secure Display Station. For more information on how to add files via the Media Library feature, please see the dedicated section in this user manual.
2- Add new files – The user can directly upload new files to the Secure Display Station and use one of them for this specific data source



Note: Only ***.mp4** files are supported for playback, and they need to be encoded using **H.264** or **H.265** codecs. Other video containers or codecs are not supported right now.

Note: Please also note the limitations related to the Media Library: maximum number of files 250 and total size of 1024 MB (all uploaded media files combined).

8.12 Configuring Views

In the *Configuration* page, select *Views* tab.

Views have the following configuration:

- **Name**

  User friendly name. Also displayed in the view selector in the top-left corner of the screen.

- **Tile Layout**

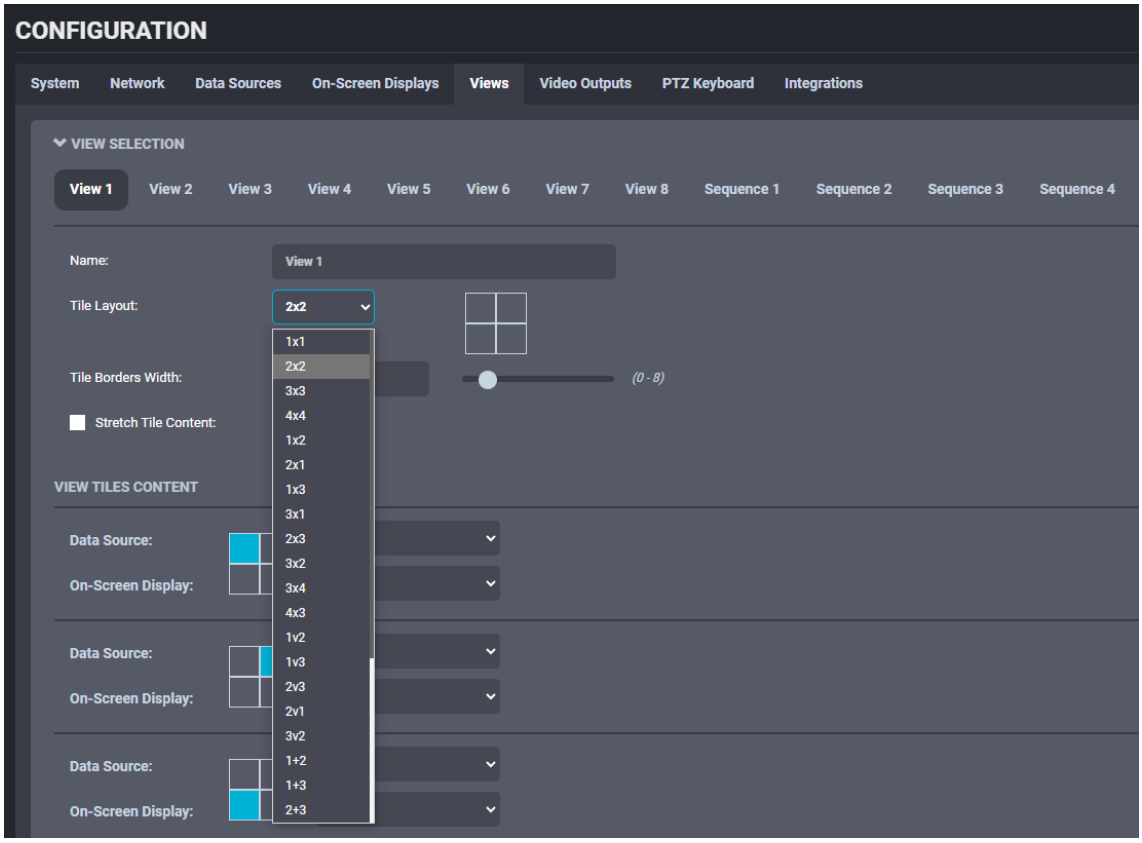
  Views display content in one or more tiles. The tile layout dictates how many tiles to display as well as how to organize these tiles.

- **Tile Border Width**

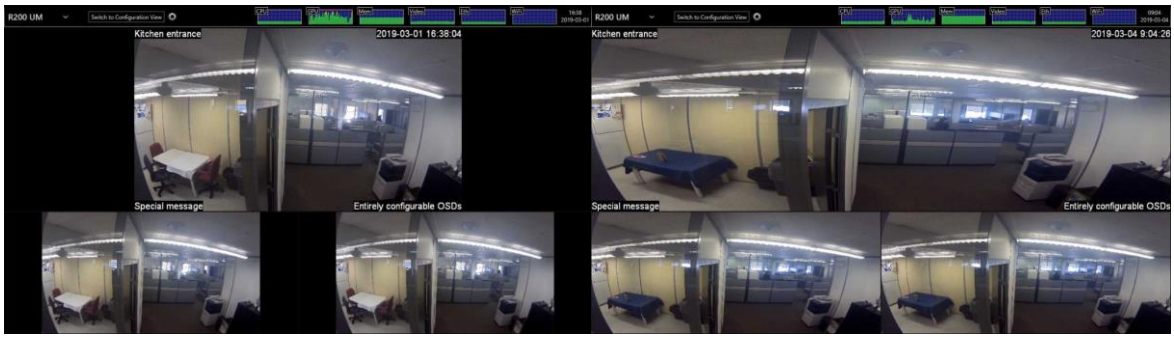
  Determines the width of the borders around each tile. A value of 0 means that no border will be shown.

- **Stretch Tile Content**

  When the aspect ratio of a video stream does not match the aspect ratio of the tile displaying it, this setting determines whether the video is stretched to fill the entire tile or scaled to fit inside.



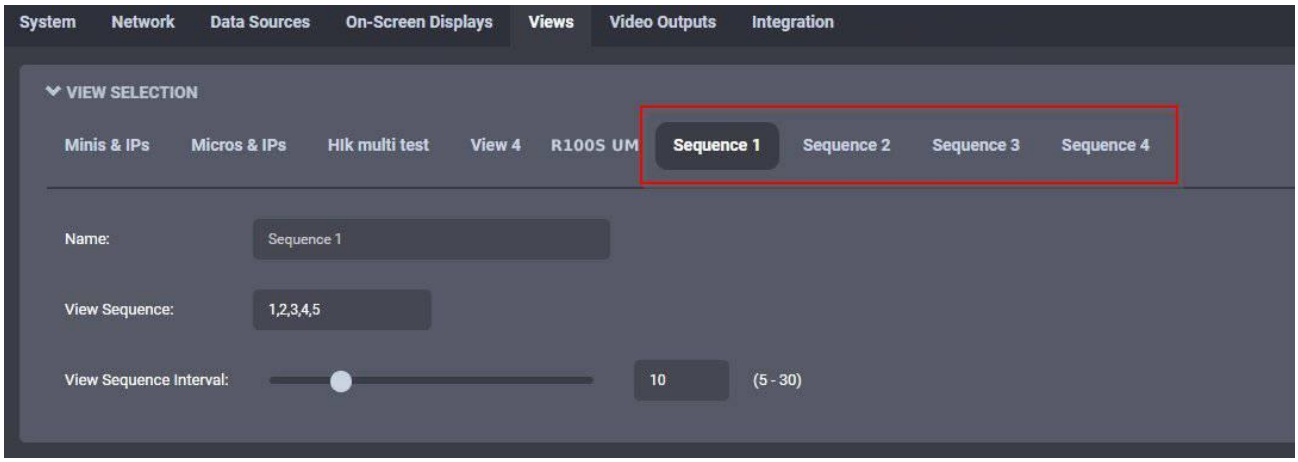
Note: Stretching the content of a video tile can visibly deform the video, as shown in the images below. Web pages simply adjust their layout based on the available space, so they are generally not affected in the same way.



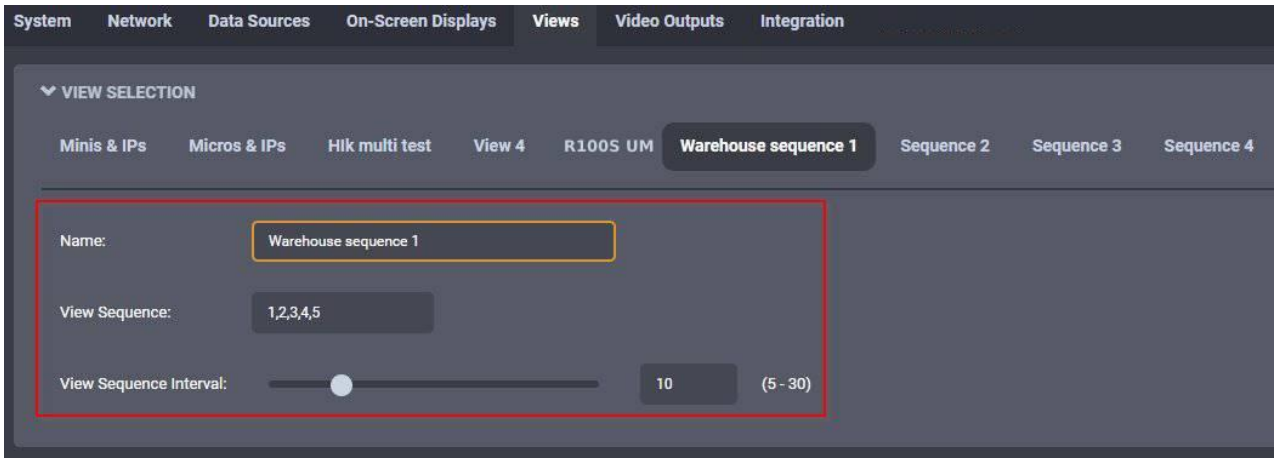
8.13 View Sequences

Once you have configured two or more views to display your various video streams, you can configure the ION-R300 to cycle through each of your views automatically on a timer.

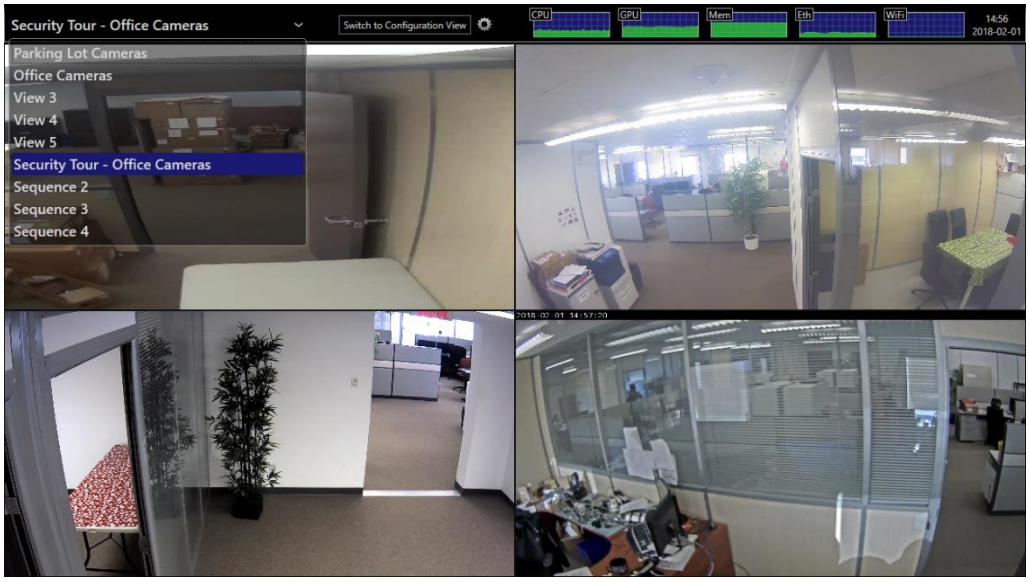
In the *Configuration* page, select *Views* tab. Select *Sequence 1, 2 or 3* views in order to customize.



To configure a view sequence, simply enter the list of views you want to display, in the desired order and separated by commas, and the duration, in seconds, each view will be displayed. Select a name for the view sequence (optional) and click on *Save* to save the configuration.

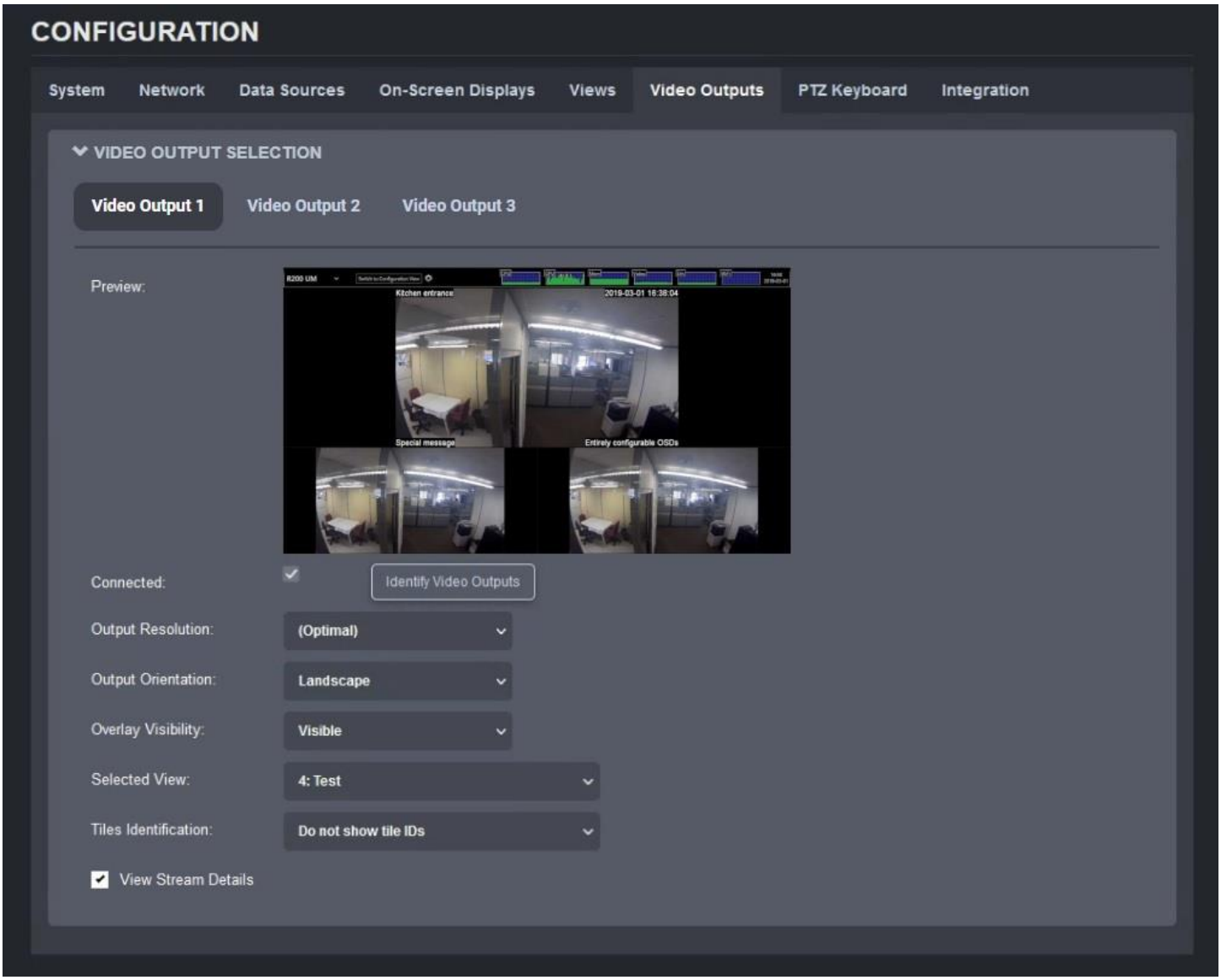


Back in Display Mode, you can now select the view sequence start the sequence. When a view sequence is selected, the name of the view currently displayed will also be shown.



8.14 Configuring Video Outputs

In the *Configuration* page, select the *Video Outputs* tab.

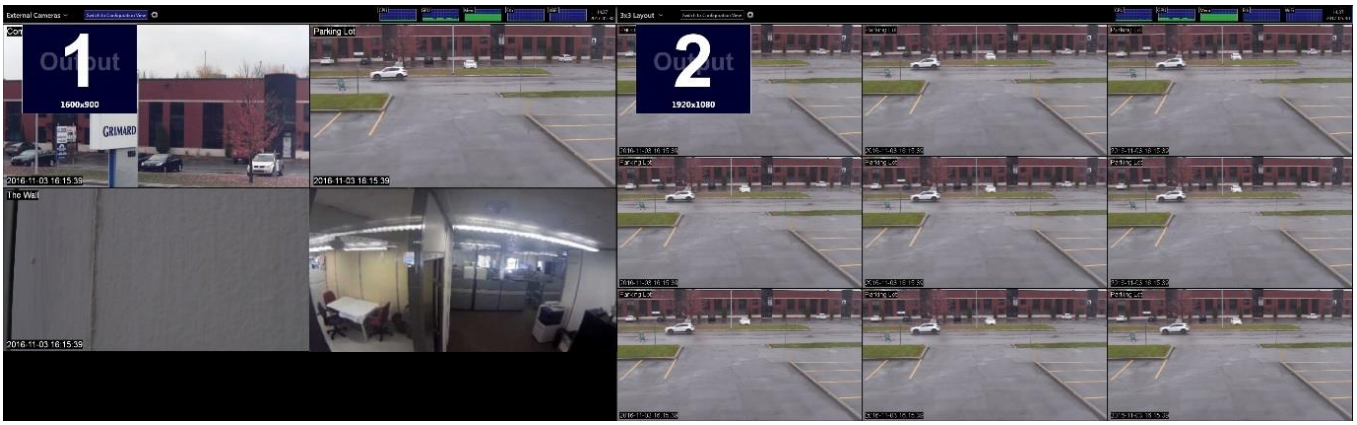


The configuration of each display output is as follows:

- **Connected** (read only)

  Indicates whether the display output is connected to a physical display.

When a single display is connected to the ION-R300, that display is always referred to as *Video Output 1* regardless of the connector the display is connected to. If two or three displays are connected to the ION-R300, click on ***Identify Video Outputs*** to determine which is *Video Output 1, 2* and *3*.



- **Output Resolution**

  Determines the display resolution to use for this output. See below for details.

- **Output Orientation**

  Determines the orientation of this output. The available options are Landscape, Portrait, Landscape (Flipped) and Portrait (Flipped).

- **Overlay Visibility**

  The overlay is the utility bar at the top of the screen. The overlay can be always displayed, or it can automatically hide itself after being used. When auto-hidden, moving the mouse to the top of the screen shows (temporarily) the overlay.

- **Selected View**

  Selects the view to display on this output. Changing this value is the equivalent of selecting a view in the view selector in the top-left corner of the screen.

- **Tiles Identification**

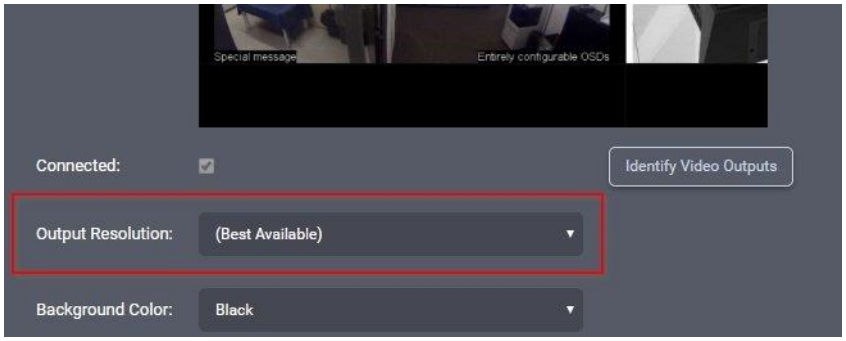
  Adds a small on-screen text for each tile depicting the ID of that tile. This is particularly useful for quickly identifying a tile when using multiple video outputs and multiple tiles in each video output. The IDs can be either global (ex. Tile 17 could be for instance the 1st tile from the 2nd video output if the 1st

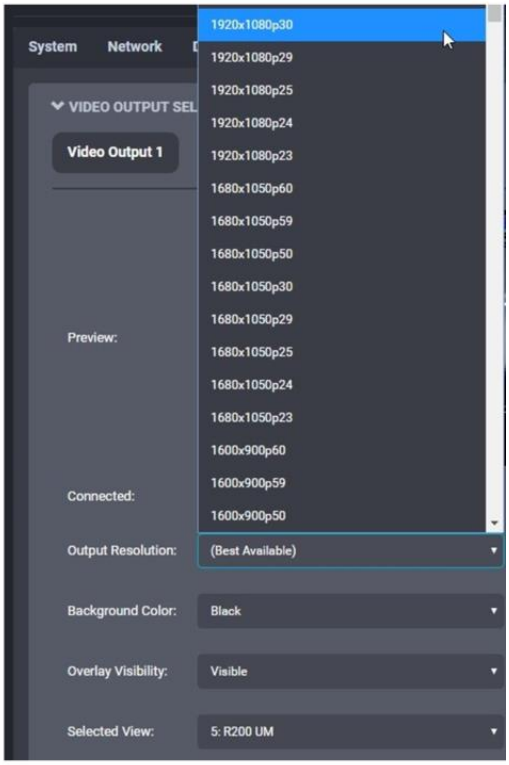
output was using a 4x4 layout with 16 tiles) or per each output (ex. Tile 2 -1 means the 2nd video output, tile number 1).

- **View Stream Details**

  Diagnostic function detailed in section 14.1.

By default, display outputs are configured to automatically select the best resolution supported by the TV or monitor. In most cases, this is the desired behavior. If you want to use a different resolution, click on ***Output Resolution*** to display the list of supported resolutions.





Note: If the ION-R300 is connected to multiple displays and you disconnect Display Output 1, another display automatically becomes Display Output 1, and the secondary or tertiary output will be considered disconnected. A common mistake is to try to configure a disconnected output. Use the ***Identify*** feature to make sure you are configuring the right display.

If you disconnect a display, the ION-R300 retains the selected output resolution in case the display was disconnected by mistake. If you reconnect the same display, the output resolution remains unchanged. If you connect a different display in its place, the new display may not support the same set of possible output resolutions. In that case, the output resolution automatically reverts to *Best Available* to prevent any compatibility issues with the new connected display.

8.15 PTZ Control

The ION-R300 allows you to send PTZ and presets commands directly from any video tile window showing video from a PTZ-enabled data source. You just need to connect any standard keyboard and mouse to your ION-R300. Once done, select the video tile to display the PTZ control.

Note: Your data source must have ***Enabled PTZ*** checked. If this setting doesn't appear, it means your data source does not support PTZ over ONVIF or was configured with PTZ disabled. Only the ONVIF Continuous Mode is supported.

The following control should be depicted within your video tile:

1: **Pin Icon**: Click to pin/unpin the PTZ control

2: **Pan/Tilt**: Controls Pan/Tilt movement. Further you move away from the middle, faster Pan/Tilt movement will be.

3: **Zoom**: Controls Zoom In/Out. Further you move away from the middle, faster zooming will be.

4: **Select Preset**: Select a preset from the list of presets stored in the data source.

5: **GoTo**: Go to the currently selected preset.

6: **Set**: Set the current PTZ position for the selected preset

7: **Create**: Create a new preset in the data source

8: **Remove**: Removes the currently selected preset from the data source

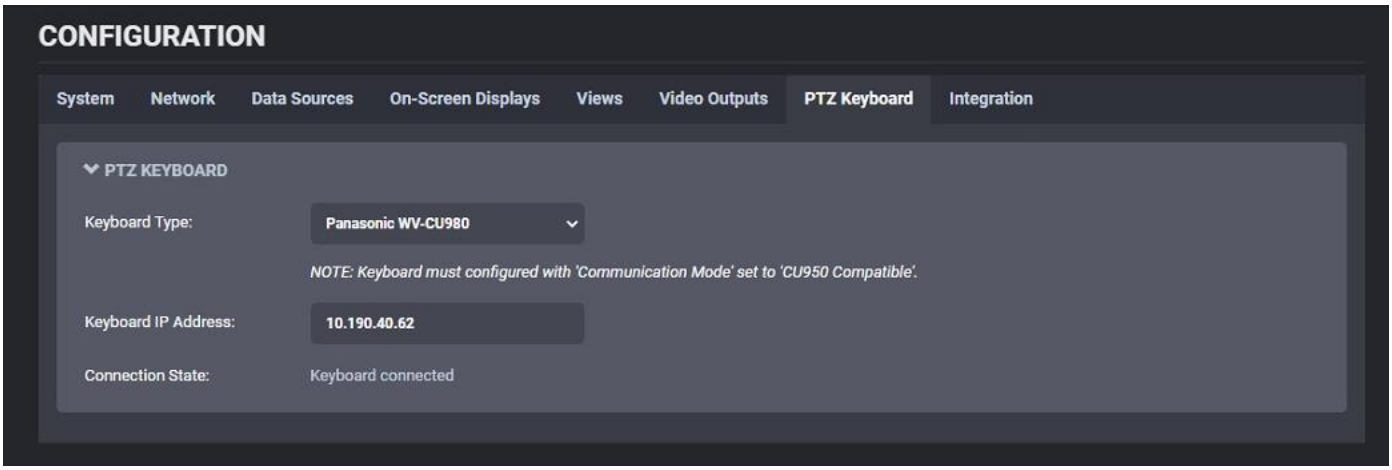
9: **Refresh Presets**: Updates the list of presets from the data source

8.16 PTZ Keyboard

The ION-R300 can be operated remotely, over the LAN, via a network keyboard (an optional joystick may or may not be attached to the keyboard).

To get started you need to select the keyboard type and input the IP address of the keyboard. If everything is configured correctly, it only takes a couple of seconds to connect to the keyboard. The web interface of the ION-R300 offers the end-user feedback with regards to the current connection state. The connection state is also reported on the keyboard's built-in status screen.

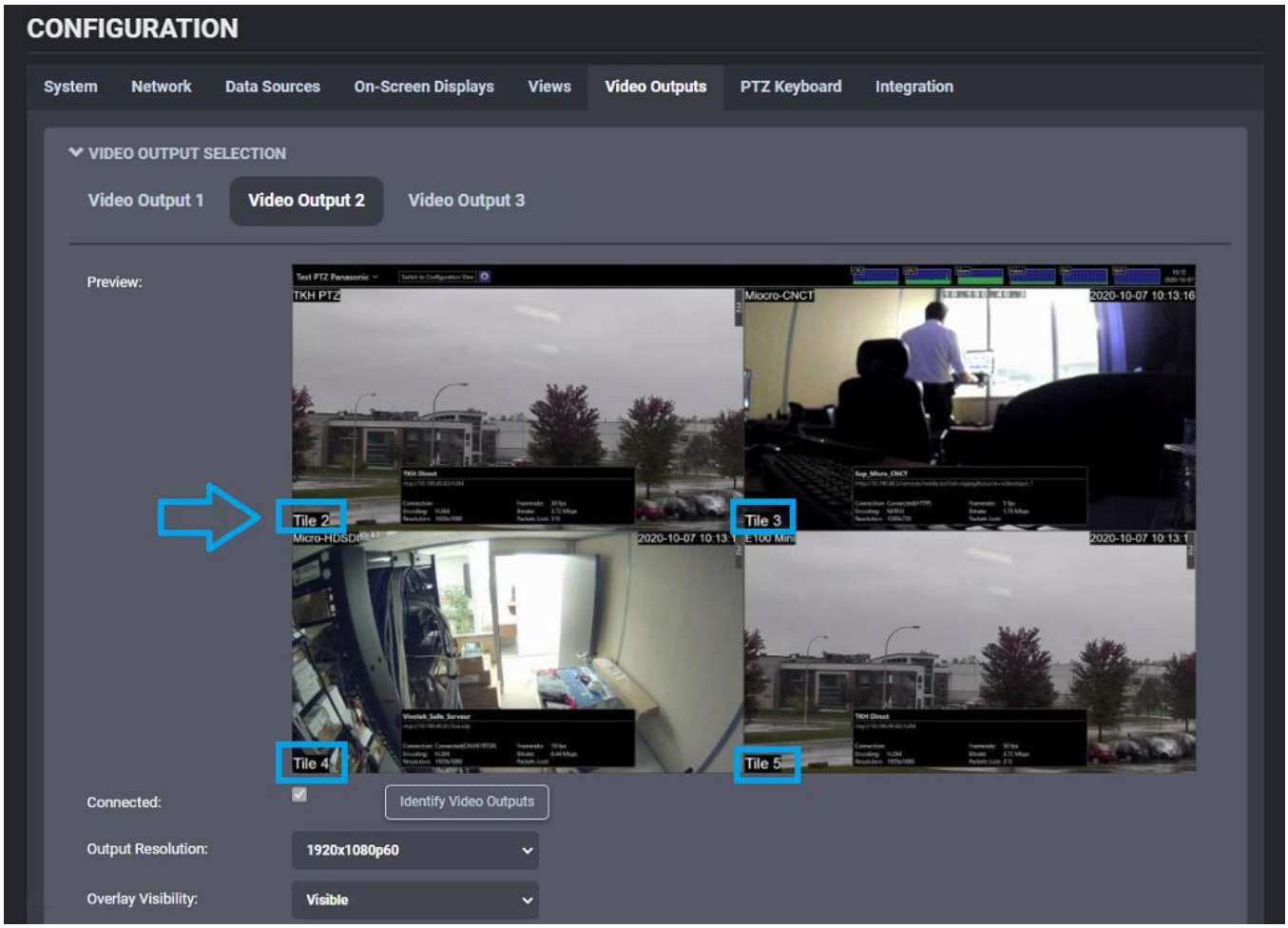
Note: Refer to your keyboard's user manual for detailed instructions on configuring its IP address and specifying the IP address of the remote device it connects to. Be aware that enabling DHCP on the remote device (e.g., the ION-R300) may result in connectivity issues if the device's IP address changes following a reboot or an Ethernet cable reconnection.



The network keyboard allows you to select a specific tile on the screen and assign a data source to it from the list of available data sources. When an invalid tile or data source is selected, a visual feedback is offered on the keyboard's built-in status screen. The command sequence is as follows:

- to select the tile, input on the PTZ keyboard the tile number + the key "MON"; note that the tile stays selected until a different tile is selected or the keyboard is disconnected
- to assign a camera to a previously selected tile, input on the PTZ keyboard the corresponding data source number + "*CAM*"

If the keyboard also has the joystick attached, the end-user will be able to operate pan/tilt/zoom functions for supported cameras (cameras that expose PTZ via ONVIF). The movement speed & direction will be based on the keyboard's internal settings.



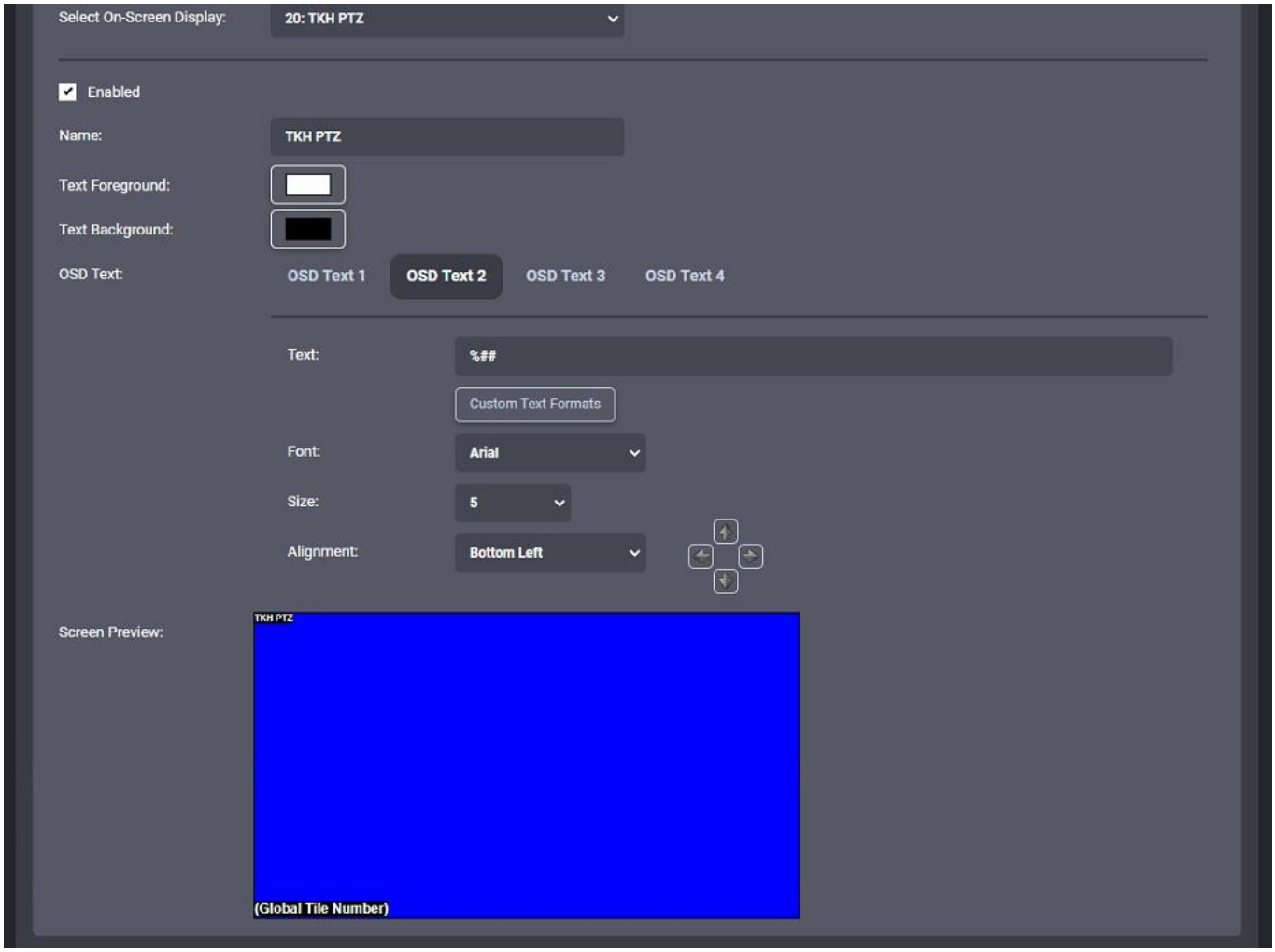
In order to help the operator correctly identify the tile on the monitor, a new dedicated dynamic OSD has been added. There are two custom string options supported:

- %#: displays the tile number in the format « Tile {OutputNum}-{OutputTileNum} »
    - Ex: Tile 2-16
    - The numbering of the tiles starts from 1 on each video output.

- %##: displays the tile number in the format « Tile {GlobalTileNum} »
    - Ex: Tile 32

    - The numbering of the tiles does not reset to 1 on each video output. If the layout on the video output #1 is 2x2, then the first tile from output #2 will be tile 5.

    - If the layout on video output #1 changes (ex.: 2x2 -> 3x3), the numbering of the tiles on video outputs #2 and #3 will also change dynamically as a consequence (the first tile from video output #2 will move from 5 to 10).



9 PERCEPT Cloud Integration

PERCEPT CLOUD

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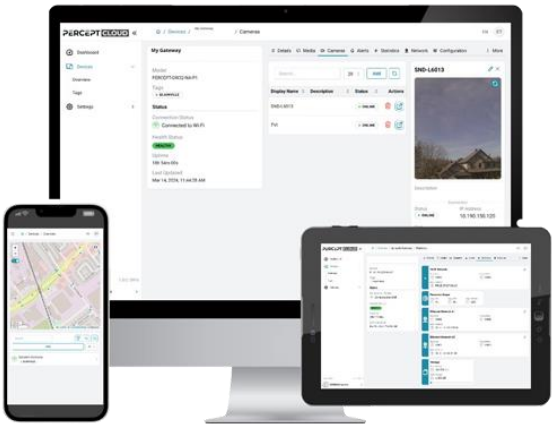


Onboard your IONODES devices into PERCEPT Cloud to unlock their full potential! Centralizing the management of your fleet of Secure Display Stations empowers you with enhanced user experience, providing the tools and features you need to oversee and operate your devices seamlessly from a single pane of glass.

With PERCEPT Cloud, you get:

- Remote access & systems management
- Device health monitoring
- Centralized software updates
- Mapping and geolocation
- Live display preview
- Configuration templates
- and much more!

Get Started Today!

Visit perceptcloud.io to start your journey by creating your PERCEPT Cloud account and onboarding your devices in a few simple steps.

10 Media Library

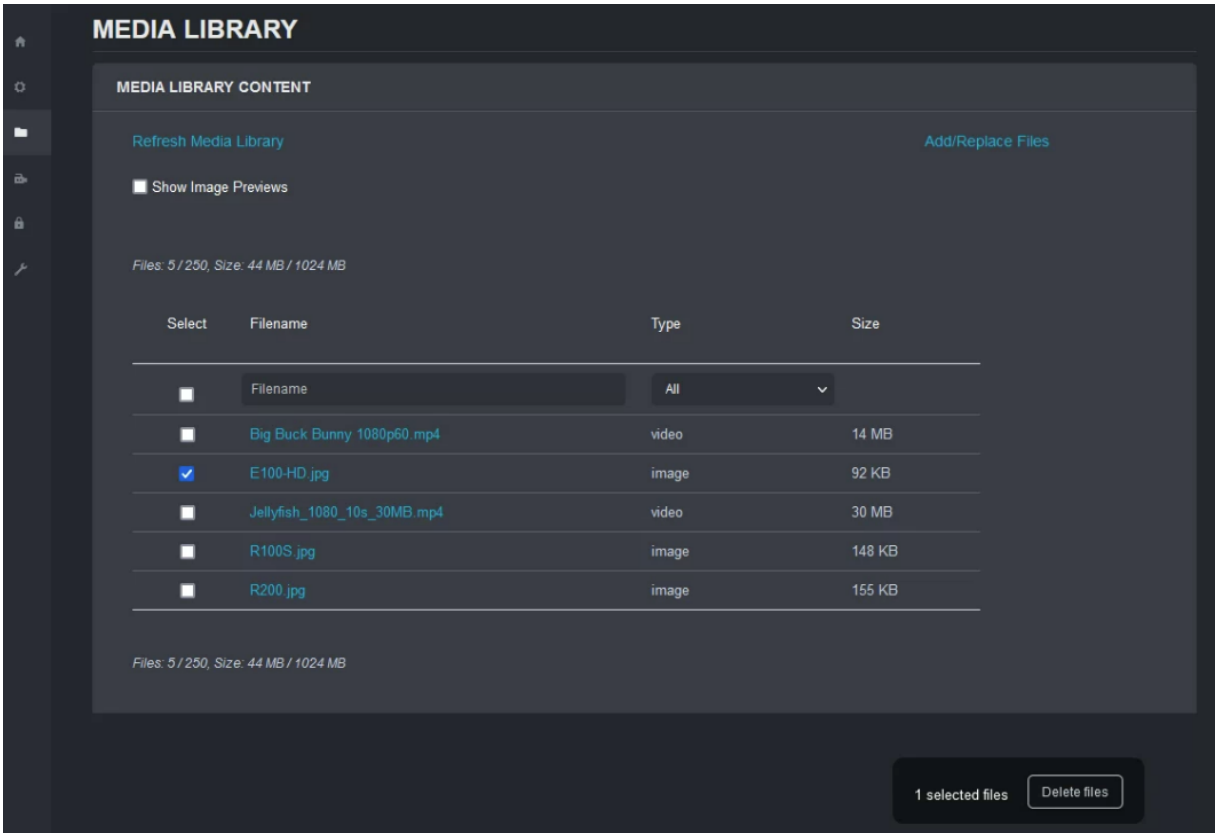
This section allows the user to manage the local library of media (image/video) files that can be displayed in tiles on the Secure Display Station.

The actions that can be performed are the following:

1) **Add/Replace Files** – use this button to upload new files (or replace existing files) from your local machine onto the Secure Display Station via the network

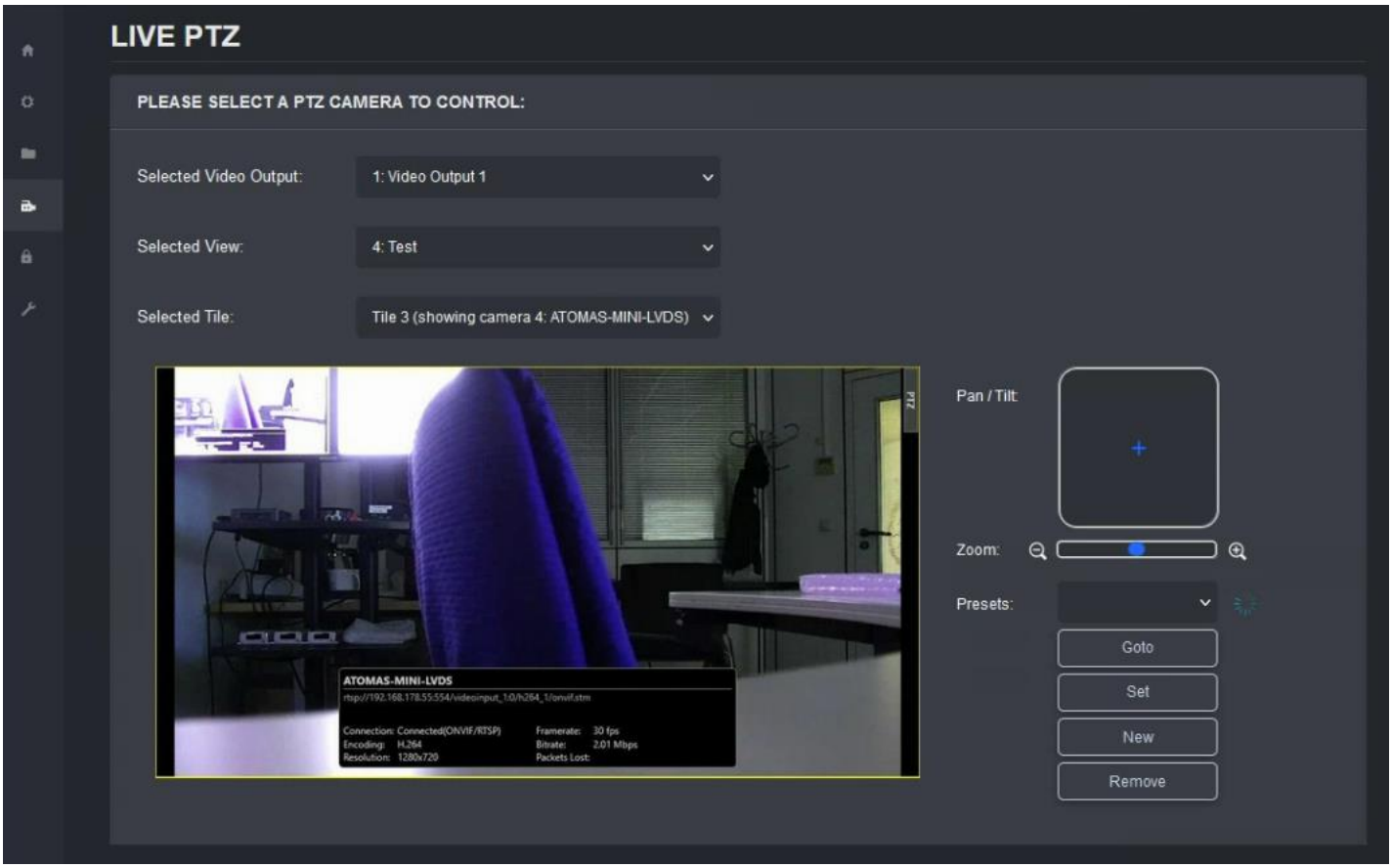
2) **Delete files** – select the files that you wish to delete and then click on the **Delete** button that appears on the bottom of the page to remove those files from the Media Library

3) **Show Image previews** – this is only possible for static images (not available for videos)



11 Live PTZ

This section allows the user to choose a PTZ-enabled camera from a specific tile inside a View and control from this web page the Pan/Tilt/Zoom movement of that camera. The user can also call existing PTZ Presets stored on the camera or create new ones.

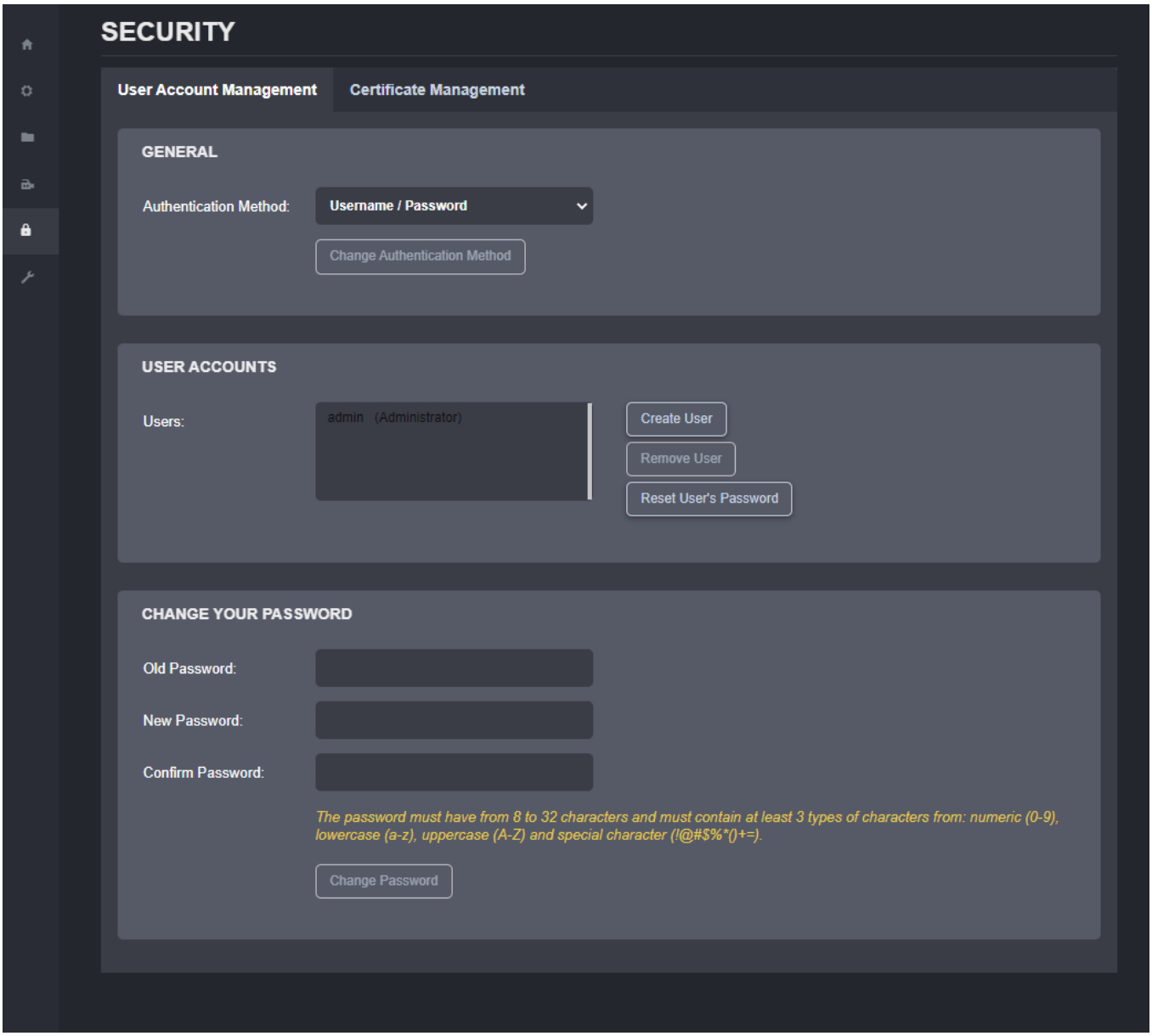


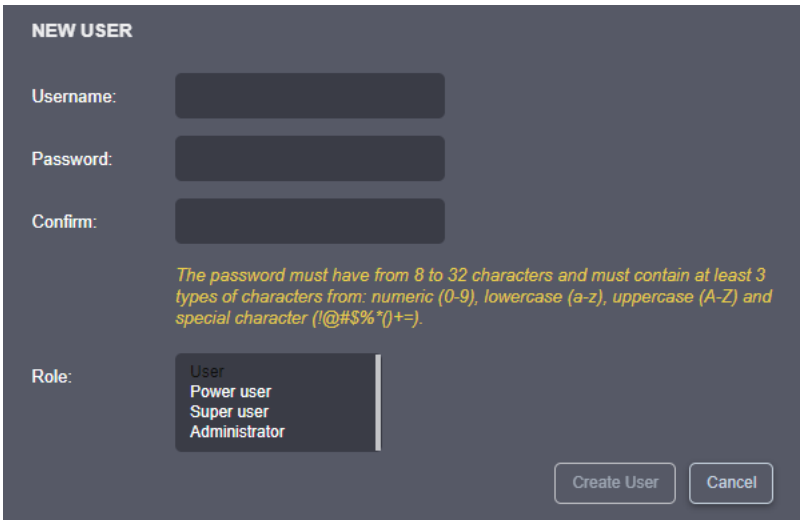
Note: The Live PTZ feature is useful for cases where the user can't connect an USB mouse & keyboard to the Secure Display Station to control the PTZ from the Display View section. Here the control is done remotely, directly from the machine running the Secure Display Station's web interface.

12 Security

12.1 User Account Management

This section allows the administrator to manage user accounts on the device (create account/ remove account/ reset user's password). If the logged in user has any other role aside from Administrator, this section will only show the option to change its own password (only administrators can manage other user accounts).





Each new user account must have a role assigned to it. There are 4 types of user role available to choose from: Administrator, Superuser, Poweruser and User. The table below summarizes permissions for each role.

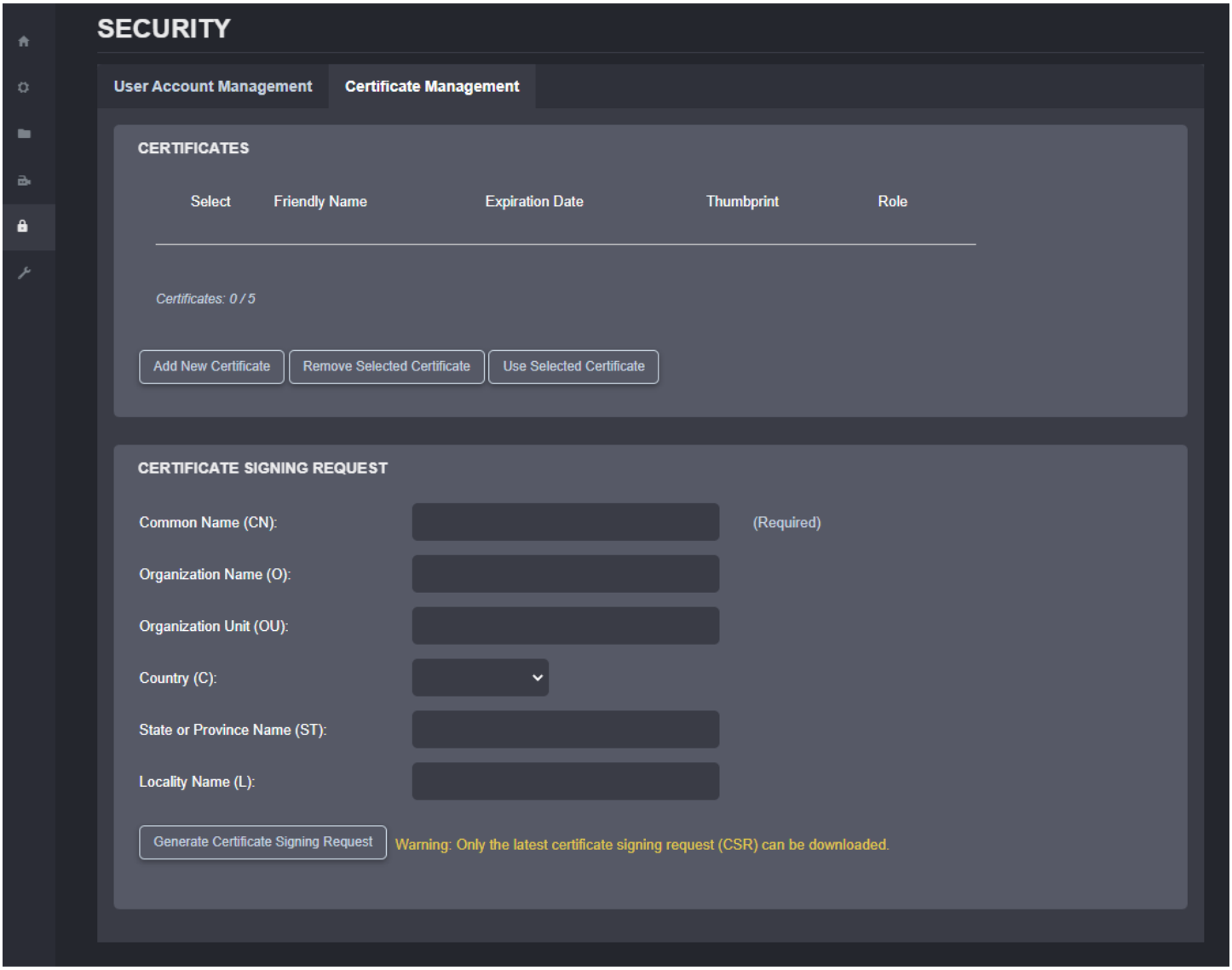
Role	Description
User	• can access System Dashboard (Product Info/System Status/Resources usage) • can access Media Library • can change his own password
Poweruser	*in addition to the User role: • can change all configuration settings • can access the Live PTZ section • can access the Maintenance section, but cannot perform a firmware update or reset the device to factory default settings
Superuser	*in addition to the Poweruser role: • can access all functionality from the Maintenance section
Administrator	*in addition to the Superuser role: • can create or modify all user accounts • can manage certificates

The built-in administrator account cannot be deleted. Upon first access to the web interface the user will be asked to change the password for the administrator account. The new password for the administrator account, will be required to have a minimum length of 8 characters and use at least 3 different character types based on the following: upper case letters, lower case letters, numbers, and symbols/special characters, such as -~ ` ! @ $ ^ *) _ -+ { [ ] | : ; ' ? , . / .

Note: There is no way to recover the password of the built-in administrator account if lost. In this case you'll need to reset the device to factory default settings by following the procedure explained in chapter 14.2 of this document.

12.2 Certificate Management

This section allows the administrator to manage custom SSL/TLS certificates.



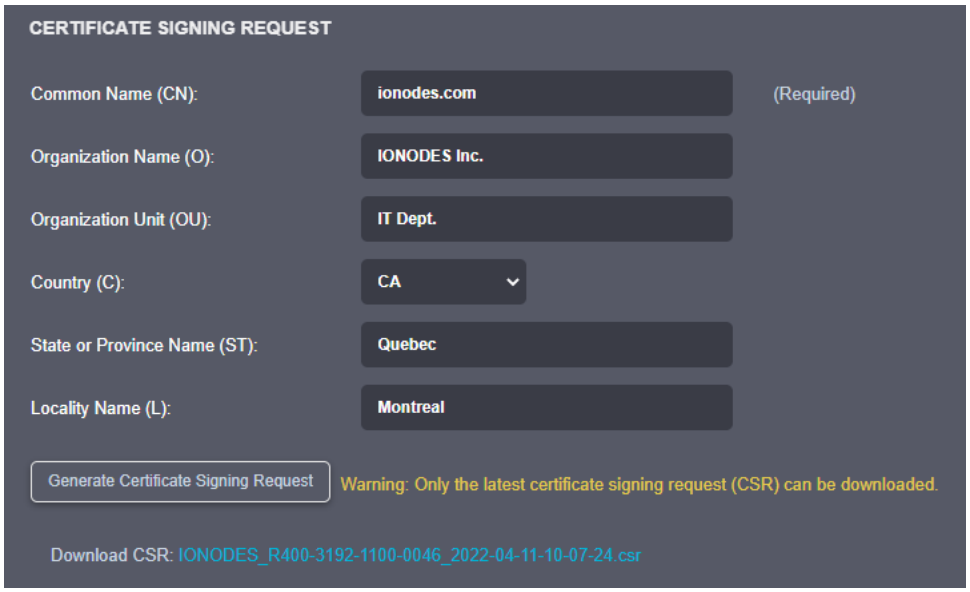
The web interface and HTTP-based APIs (ION API) of the SDS can be accessed using HTTP or HTTPS. In HTTPS, the communication protocol is encrypted using Transport Layer Security (TLS) or Secure Sockets Layer (SSL). The SDS supports TLS 1.2 (support for the older TLS 1.0 and TLS 1.1 has been disabled since firmware v6.7.0.0) and uses a self-signed certificate generated during manufacturing, making it unique for each device. You can replace the default certificate by providing your own custom SSL/TLS certificate.

Note: The only formats accepted for SSL/TLS certificate files are *.pfx or *.p12.

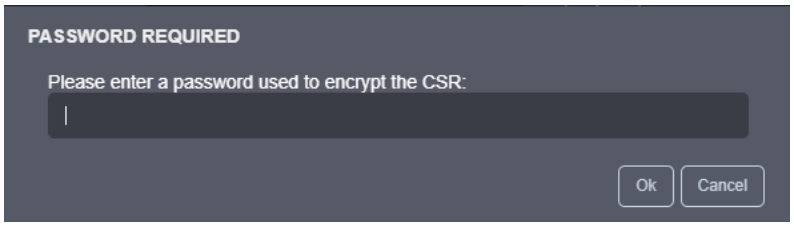
A Certificate Signing Request (CSR) is a block of encoded text forwarded to a Certificate Authority (CA) when users apply for a custom SSL/TLS certificate. CSR is created on the server where the certificate will be installed, in our case on the SDS. CSR includes information such as domain name, organization name, locality, and country. The request also contains the public key, which will be associated with the certificate generated, and the same server also generates the private key. When developing the certificate, the CA only uses the public key. The private key should be saved and kept secret, as the private key is the key pair of the public key, and the certificate would not work if we lost the private key.

A CSR contains:

- Common Name (CN): Fully qualified domain name of the server, such as *ionodes.com*
- Organization Name (O): Legal name of the organization such as '*IONODES Inc.*'
- Organization Unit (OU): Division of the organization, such as *IT Department*, or Marketing
- Country (C): such as *Canada*
- State or Province Name (ST): such as *Quebec*
- Locality Name: such as *Montreal*



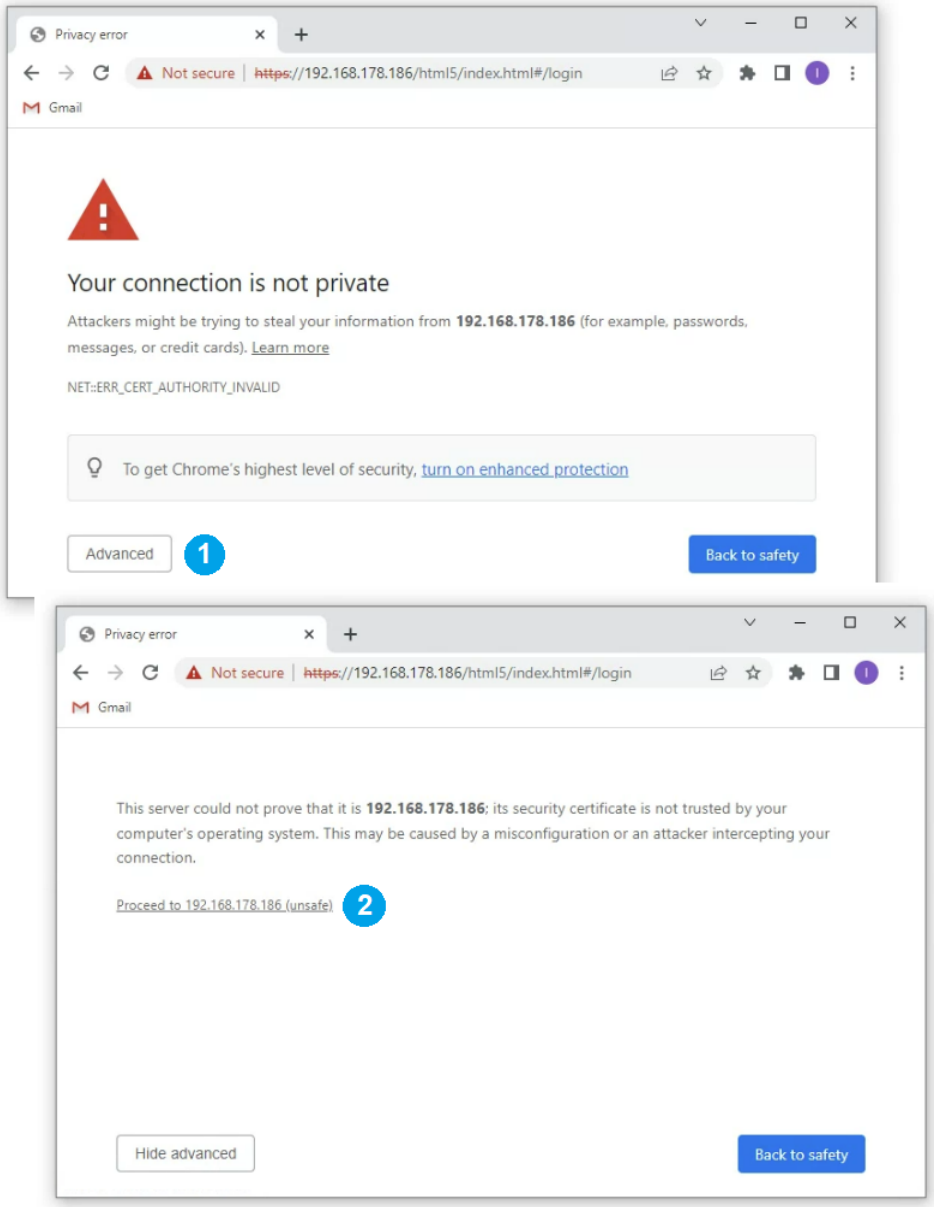
After the user clicks on “Generate Certificate Signing Request” he’ll need to input a password to be used for encrypting the CSR and then the new CSR file (*.csr) will be ready for download.



The *.csr file must be sent to either a local certificate authority (it can be a local server running this service) or to a global certificate authority (IdenTrust, DigiCert, GoDaddy, etc.). Based on the CSR the CA server will generate a certificate using the CA tools on that server. This is usually a *.pfx or *.p12 file that can be uploaded and used on the decoder.

Note: The tools required to generate the SSL/TLS certificate are not readily available on a standard Windows machine. This feature is really meant for high-end corporate customers that want to have full control over their security inside their network.

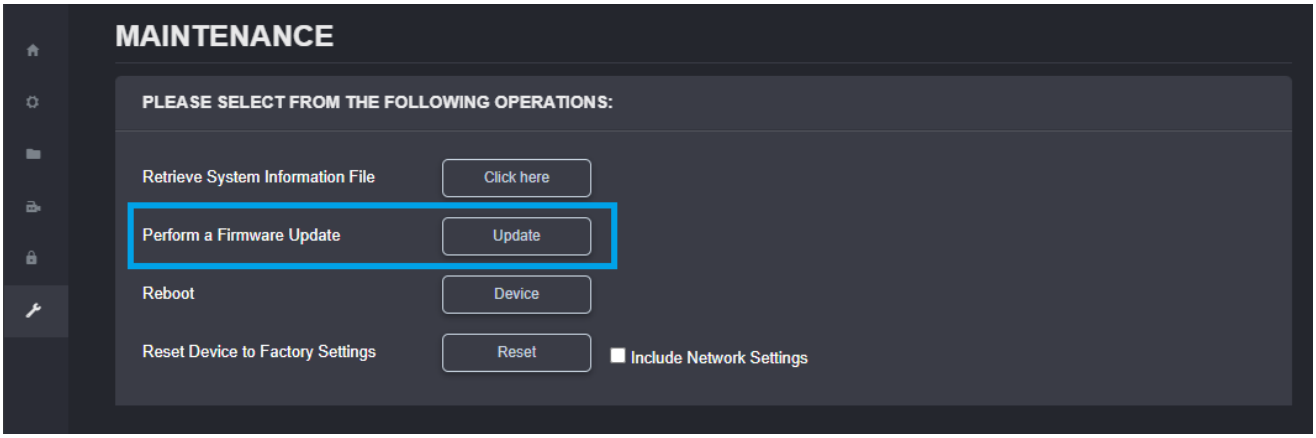
When using HTTPS with the default self-signed certificate, your browser might show a warning. You'll need to hit "Advanced" (1) and then click on "Proceed..." (2) to continue loading the web interface.



13 Performing a Firmware Update

This section describes how to update your ION-R300 to newer firmware versions from the web interface.

1. On the device, switch to configuration view OR navigate to your device's web interface.
2. If not currently logged in, log in using an administrator account's credentials.
3. Click on the ***Maintenance*** tab.
4. Click on the ***Update*** button. You will be asked for the firmware update file; please select the **.iof** file which was provided by IONODES.

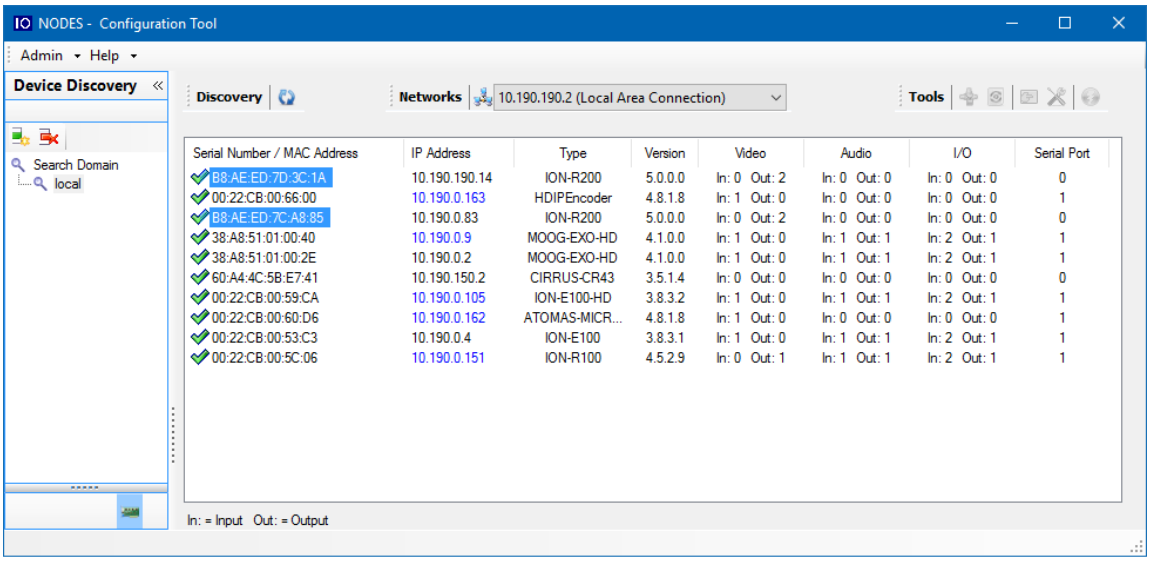


5. You will see the following messages indicating the status of the update:
    - Firmware upload in progress… (100%)
    - Firmware uploaded. Saving to internal storage… (0%)
    - Validating and decompressing firmware… (0%)
    - Firmware ready for installation. Rebooting device… (0%)
        - Web page will disconnect, and the device will reboot.
        - Once the device has rebooted, return to the configuration view. If you are performing the firmware update remotely, the web interface automatically reconnects.
    - Testing firmware stability… (##%)
        - Takes 120 seconds.
    - Firmware update complete. (100%)

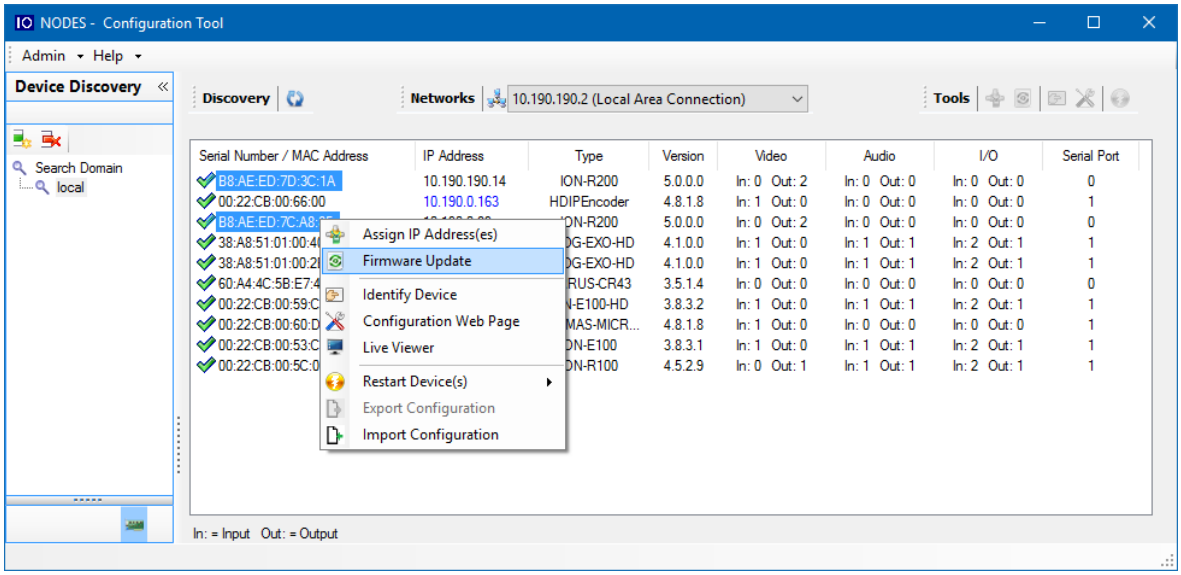
13.1 Batch Firmware Update

This section describes how to perform a batch update of multiple ION-R300 devices to newer firmware versions from the ION Configuration Tool (ICT). The batch firmware update works by starting a firmware update session. Only one session at time is allowed and only 20 devices can be selected by session.

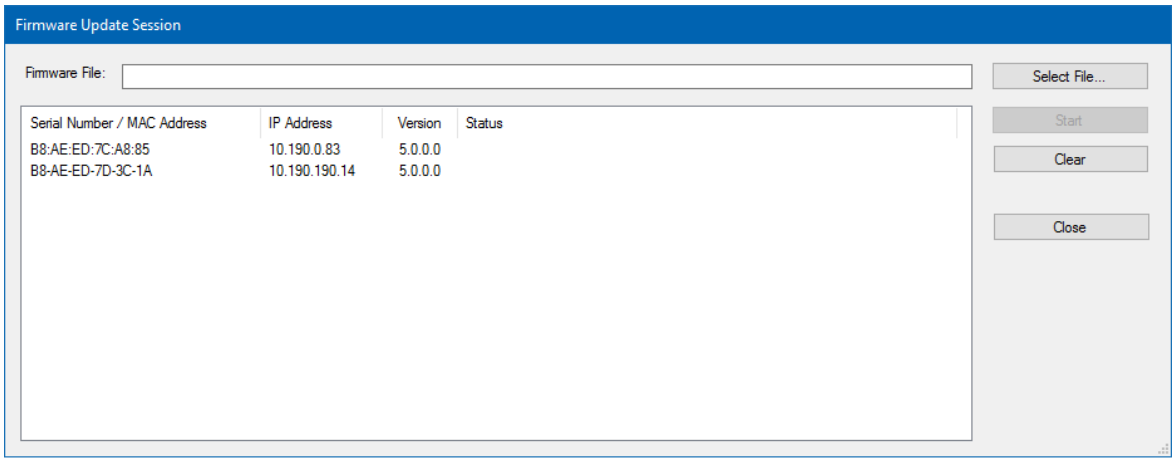
From the ICT, select one or more ION-R300 devices.



By using the right mouse button on the selected devices, choose the “Firmware Update” menu option.



To start a firmware update session, choose the ".iof" file corresponding to the new firmware by clicking to the "Select File ..." button. Once selected, click to the "Start" button.



Once started, the "Firmware Update Session" window shows the progress of the firmware update. This window can be closed at any moment without losing the current session.

If closed, the progress of the current session can be followed by reopening the "Firmware Update Session" window by clicking the button from the "Tools" toolbar.

Once done, clear the current session from the "Firmware Update Session" window and restart a new session if needed.

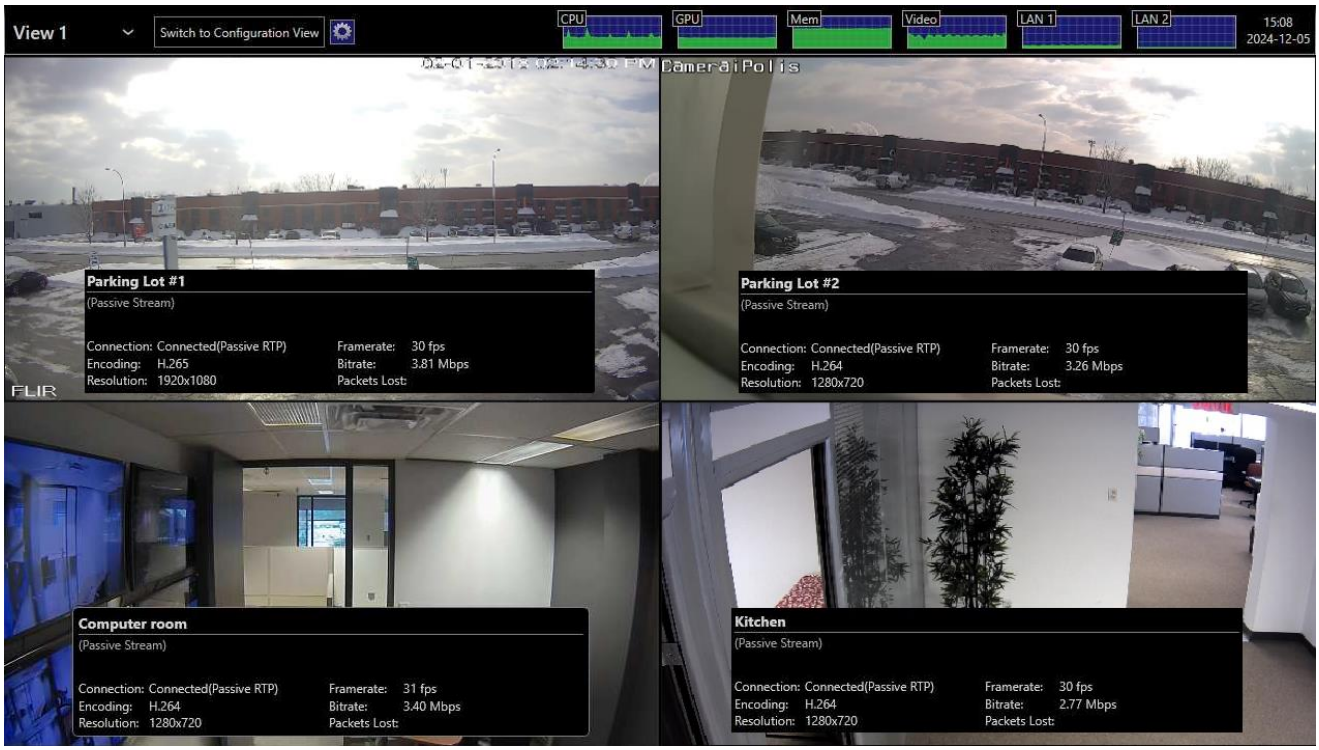
14 Diagnostics

14.1 View Stream Details

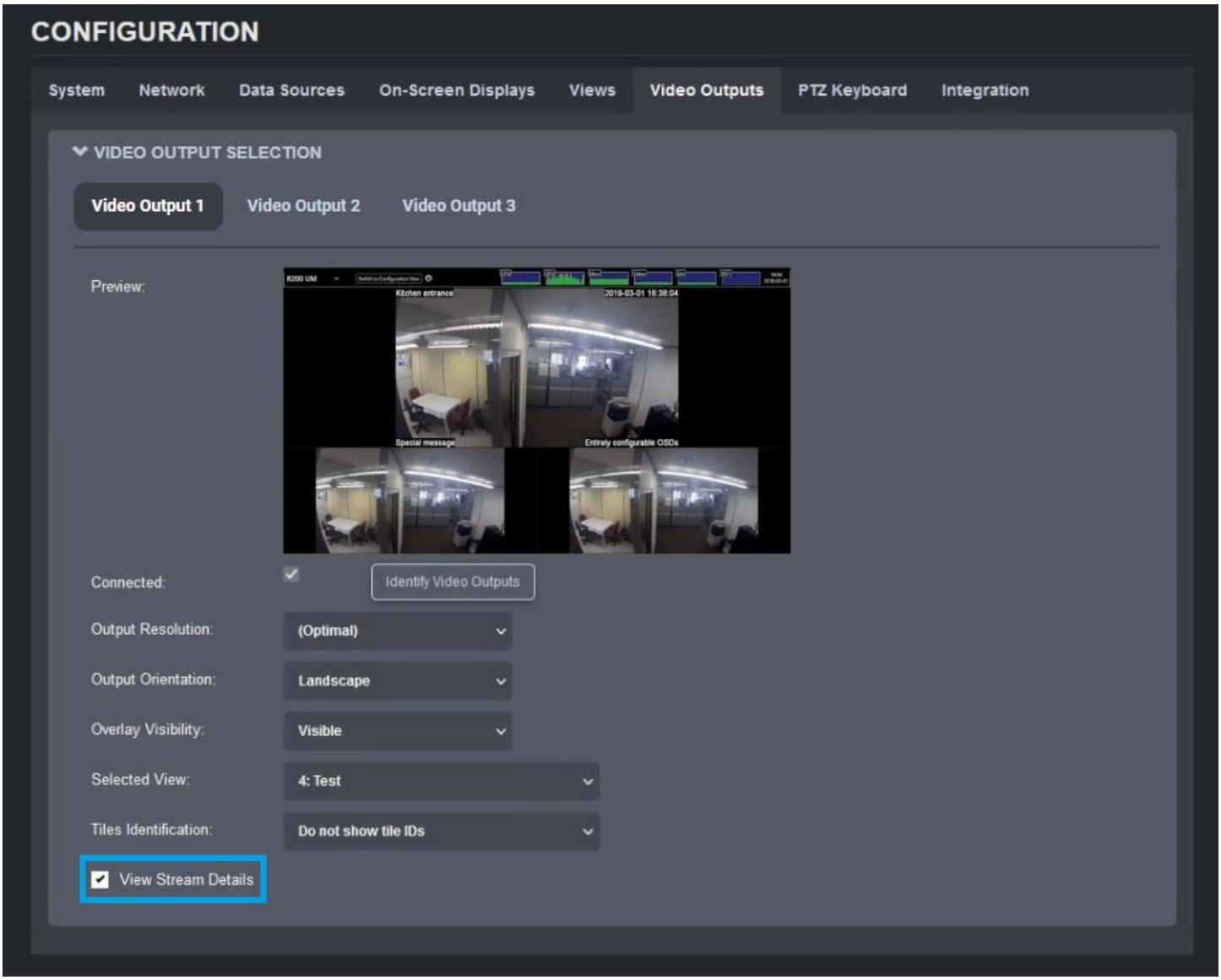
To help diagnose connectivity or performance problems, the ION-R300 can display live details about the video displayed in each tile. To display the stream details, click on the button at the top of the screen.

The stream details include:

- The name of the data source
- The connection URI
- The current connection status
- The video stream encoding and resolution (not the size of the tile the video is playing in)
- The video stream framerate
- The video stream bitrate
- The network packet lost count (displayed only when one or more packets are lost)



Stream details can also be activated from the Configuration > Video Outputs section of the web interface, by ticking the checkbox at the bottom of the page:



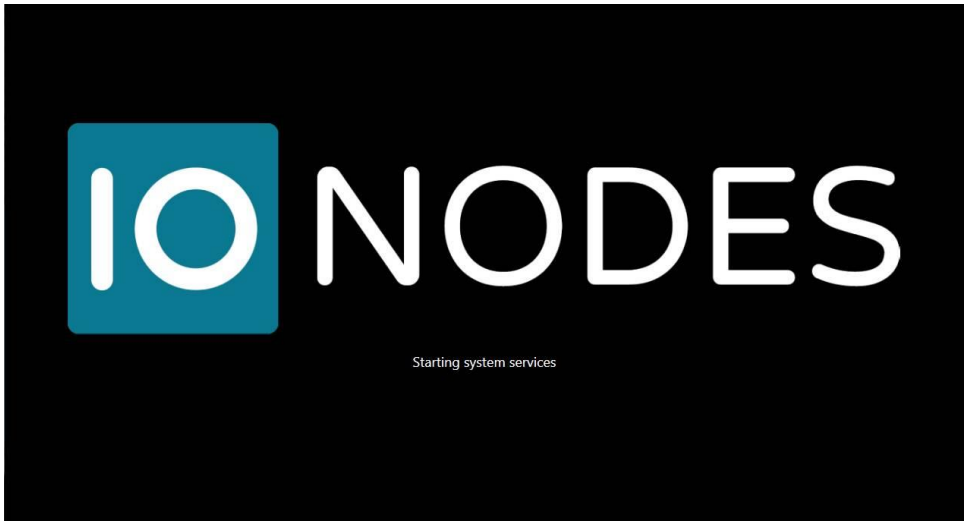
14.2 Safe Mode

It is possible to configure the ION-R300 in such a way that exceeds its decoding capabilities. Whether it is due to the number of concurrent video streams or the combined bitrate of all video streams being too high, in such scenarios the ION-R300 may run at maximum capacity. In such a scenario, the ION-R300 may become increasingly unresponsive, thus preventing access to the configuration of the device to fix the problem.

It is also possible that a video stream from a third-party camera may not strictly follow the H.265 or H.264 video encoding standard, causing problems in the ION-R300 while decoding the video stream.

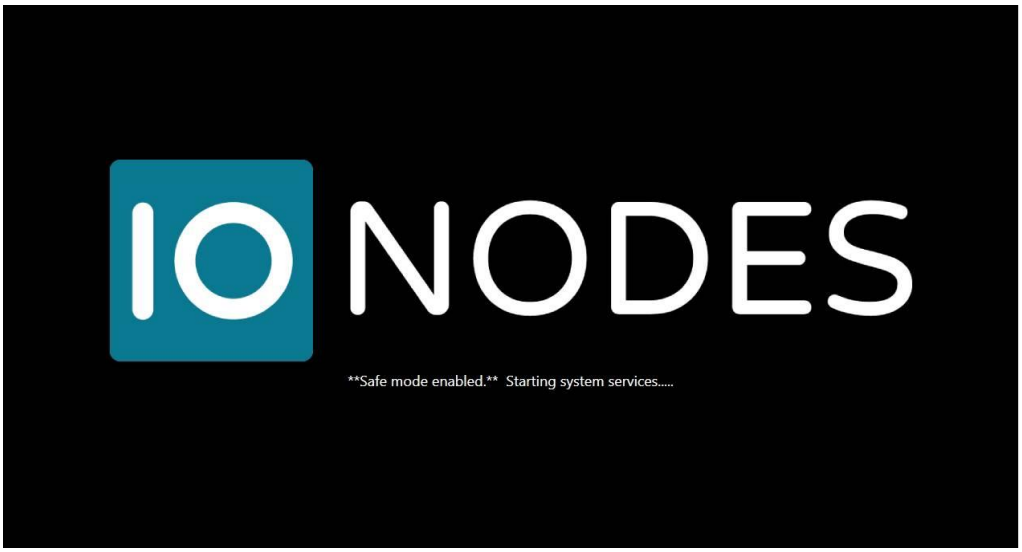
For all scenarios where the device becomes uncooperative, the ION-R300 offers a solution in the form of safe mode. Safe mode is a special mode of operation where all data sources are forcibly disabled. The device therefore no longer decodes any video, giving you easy access to the configuration of the device to fix the issue before returning to the normal mode of operation.

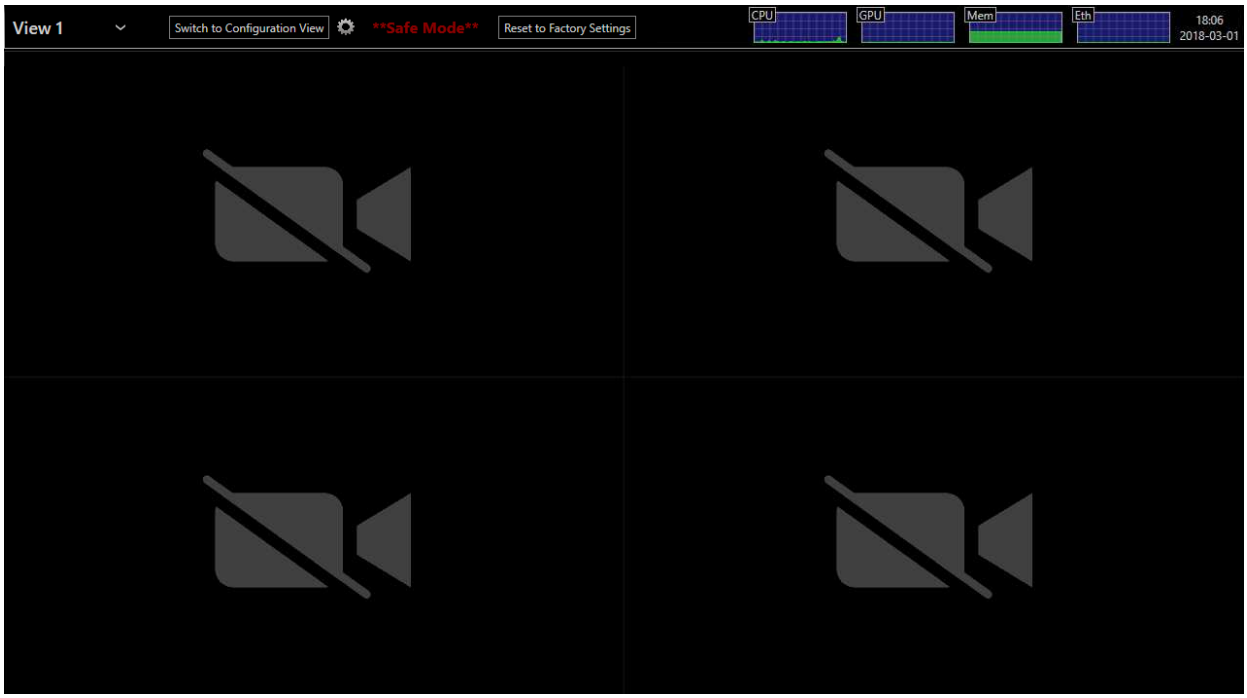
Safe mode is enabled during the boot-up of the device. It requires a keyboard to be connected to the device. While the ION-R300 is booting up, wait for the device to reach the step shown in the image below:



While the ION-R300 starts its system services, press and hold the LEFT SHIFT key and RIGHT SHIFT key on the keyboard. When the device detects the key combination, it acknowledges the switch to safe mode operation as shown below.

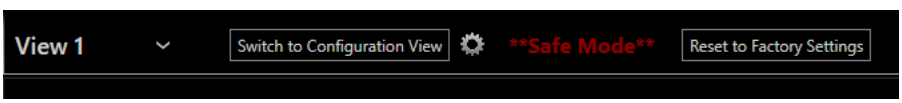
Note: It takes only a few seconds for the ION-R300 to start the system services and safe mode can be enabled only during that step of the boot-up sequence. If the device finishes booting up before you press the key combination, you can simply shut down and restart the device and try again.



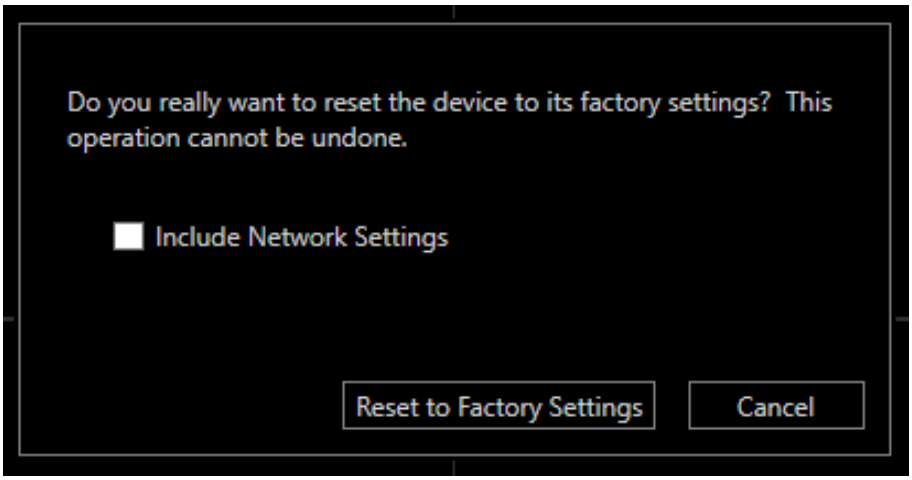


Once you fix the configuration of the ION-R300, you need to restart the device to return to its normal mode of operation.

When the device is in Safe Mode, the user is also presented with an option to perform a reset to factory default settings. This is useful, for instance, if you forget the password to the administrator account.



Once you click on the "*Reset to factory settings*", a pop-up window will appear asking for confirmation and whether to include or not the network settings.



After the process is started the unit will reboot and reload the factory settings.

Annex A – Statement Limited Warranty

Please visit https://www.ionodes.com/limited-hardware-warranty/ for the latest warranty information.