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GTION-R200
User Manual

Version 1.4

GTION-R200

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.

CAUTION: 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 any mechanical strain.

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

- Do not position the equipment as 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; there may be a risk of electric shock.
- 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. Opening the equipment casing may expose you to dangerous voltage or other risks. Refer servicing to IONODES technical service personnel. Never open the device yourself as this will void the warranty.
- 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, such as thinner and benzene, as they may damage the surface of the product.

3 Handling Notes

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

Do not use volatile liquids, such as insect spray, 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.

4 Moisture and Condensation Notes

Moisture condensation will damage the product. Read the following notes carefully.

Moisture 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 GTION-R200

The ION-R200 multi-port decoder delivers high quality H.264 video decoding and display to the video surveillance market. It is an embedded, high-performance digital video decoder, capable of decoding multiple H.264 and/or MJPEG video streams and display them on up to two digital displays with up to 4K resolution.

The high-performance decoding capabilities of the ION-R200 offer a cost-effective way to decode and display digital camera streams while providing the benefits of video over IP and wireless networks.

The ION-R200 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-R200 uses highly efficient hardware-based stream decompression.

The ION-R200 is fully compatible with H.264 or MJPEG video streams provided by most third-party IP cameras and video encoders on the market. Combined with the IONODES line of IP-based video encoders, the ION-R200 can also decode video streams provided by most third-party analog cameras.

5.2 Parts List

Qty	Description
1	ION-R200 appliance
1	19V DC power supply with country-specific power plug attachments
1	VESA mounting bracket and screws
1	USB utility key
1	Quick install guide
1	USB-C to HDMI adapter

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

- USB mouse & keyboard
- HD Displays (HDMI and / or Mini DisplayPort)
- Internet access and/or a network switch
- 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 in the event that your ION-R200 or its components require service. The label is attached on the underside of the enclosure.

6 Hardware Installation

6.1 Equipment Installation

The ION-R200 can be placed on a flat surface, such as a desktop, or mounted via the available mounting bracket.

When installing the ION-R200, position the unit to allow for cable clearance at the front and rear of the unit. Make sure that minimal air flow is provided to the unit.

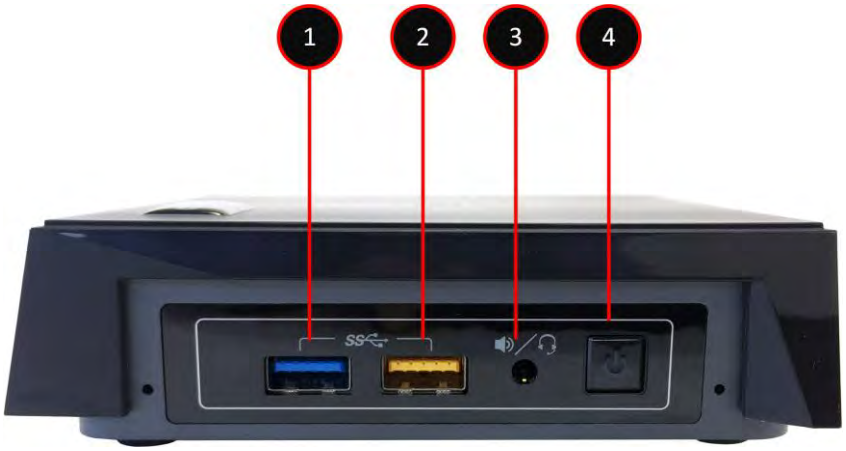
The ION-R200 can be mounted to various mounting structures via the available VESA mounting assembly. Ideal to mount the ION-R200 behind a screen. Note that VESA mounting screws are shipped with the device.

Warning: Be careful not to damage the enclosure when using mounting screws.

7 Connections

The ION-R200 offers two separate digital video output connections as well as several USB and audio connections.

7.1 Front Panel



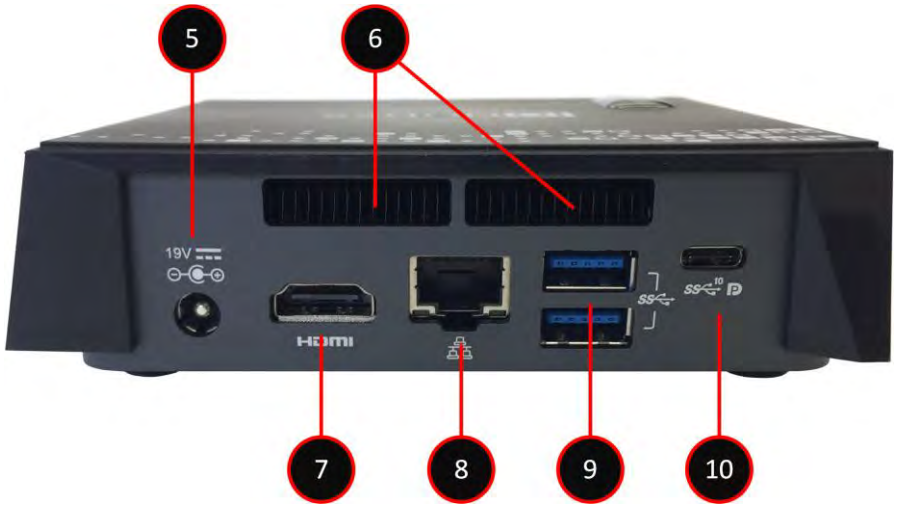
1. **1 x USB 3.0**
   General purpose USB connector interface. This port can be used to connect an optional keyboard or mouse.
2. **1x USB 3.0 (with charging capability – Yellow)**
   General purpose USB connector interface with charging capabilities. Can be used to recharge an external USB device.
3. **AUDIO IN / OUT**
   3.5 mm jack which can be used to connect both an audio input and an audio output source. The stereo channel provided by this connector exposes one channel for the audio input and the other for the audio output.

Warning: Audio support is currently not implemented on the ION-R200 and may be made available in a future software update.

4. **POWER ON / OFF**

   Button used to boot up or shut down the device. The button includes a LED indicating when the appliance is powered on.

7.2 Rear Panel



5. **POWER**

   Appliance power connector. Connect to the power supply block provided with the appliance (19V).

6. **AIR VENTS**

   Please ensure air vents are clear to allow for proper device ventilation.

7. **HDMI OUT**

   HDMI 2.0a connector interface for video output to an HD digital display.

8. **ETHERNET**

   ION-R200 Gigabit Ethernet network port. Please use a straight RJ45 (cat. 5 or 6) network cable. Note that the ION-R200 cannot be powered using Power-over-Ethernet (PoE).

9. **2 x USB 3.0**

   General purpose USB connector interfaces. These ports can be used to connect an optional keyboard or mouse.

10. **USB-C Display Output**

    DisplayPort version 1.2 USB-C connector interface for video output to an HD digital display. You may use the provided USB-C to HDMI adapter to connect to an HDMI display.

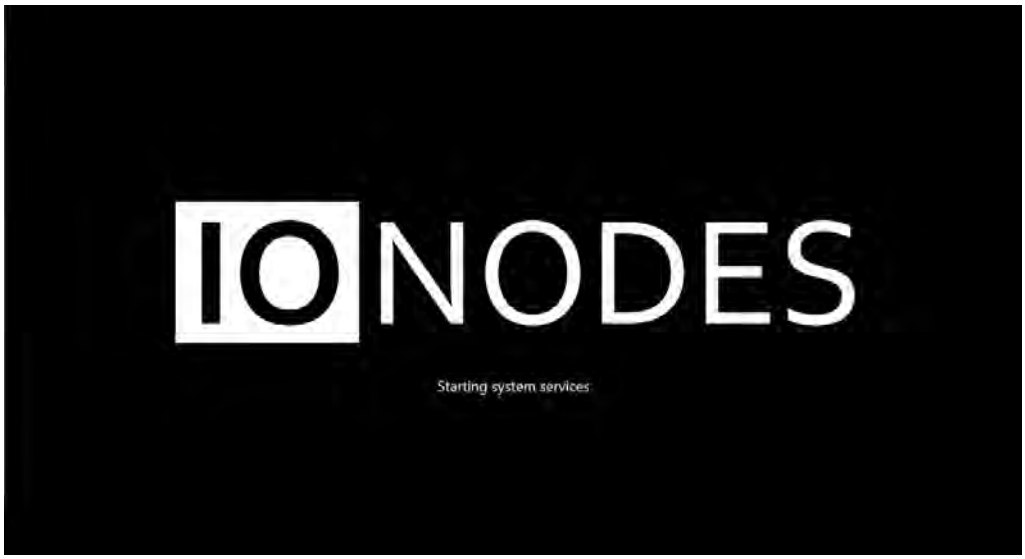
8 Powering the ION-R200 for the first time

Before you can use the ION-R200, you need to connect the following cables:

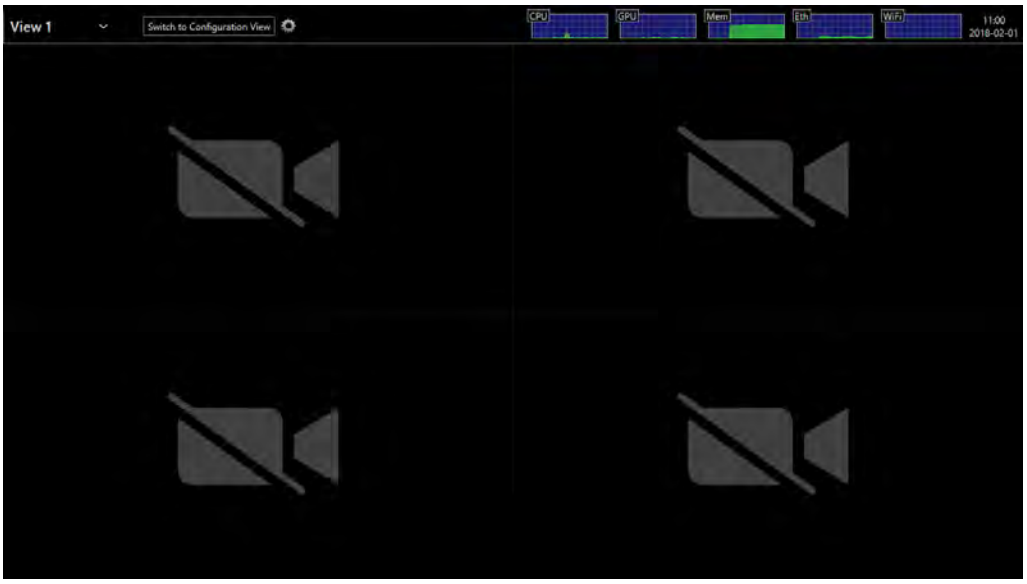
- Display(s): You can connect one display using the HDMI connector and/or one display using the USB-C DisplayPort connector.
- Ethernet network
- Keyboard and mouse *(optional)*
- Power

Connecting a keyboard and mouse to the ION-R200 allows you to configure the ION-R200 locally and for this reason are strongly recommended. If you plan on configuring the device remotely, then the keyboard and mouse are optional.

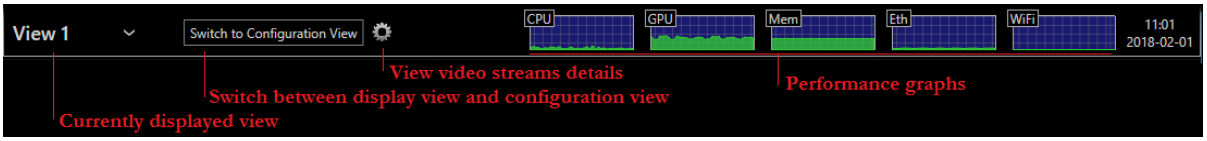
Once all the required cabling is connected, press the POWER ON / OFF button on the front panel of the ION-R200. After a few seconds, the image below appears on all connected displays:



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



The ION-R200 is now ready to be configured.



- **Currently Displayed View**
  In the top left corner appears the view 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 switch 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.

9 Device Configuration

Before the ION-R200 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-R200 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-R200, or it can be performed remotely using a computer or laptop connected to the same network.

9.1 Network Configuration Basics

By factory default, the ION-R200 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 provide a unique network address and associated settings. The device then uses the DHCP-provided network configuration to communicate with other computers and cameras the network.

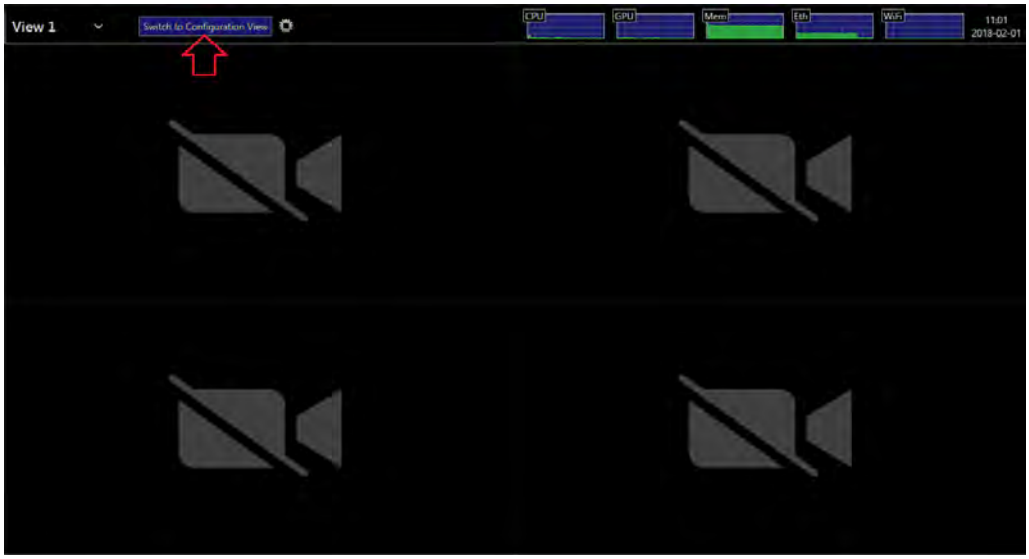
If no DHCP server is found on the network, the device switches to APIPA mode (Automatic Private IP Addressing). In this mode, the device automatically assigns itself a unique network address in the range 169.254.0.1 to 169.254.255.254 with subnet mask 255.255.0.0. APIPA mode ensures that devices in the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

If computers and cameras on your network are not configured in APIPA mode, the ION-R200 will not be able to communicate with them while in APIPA mode. In such a case, the network configuration of the ION-R200 must be set manually.

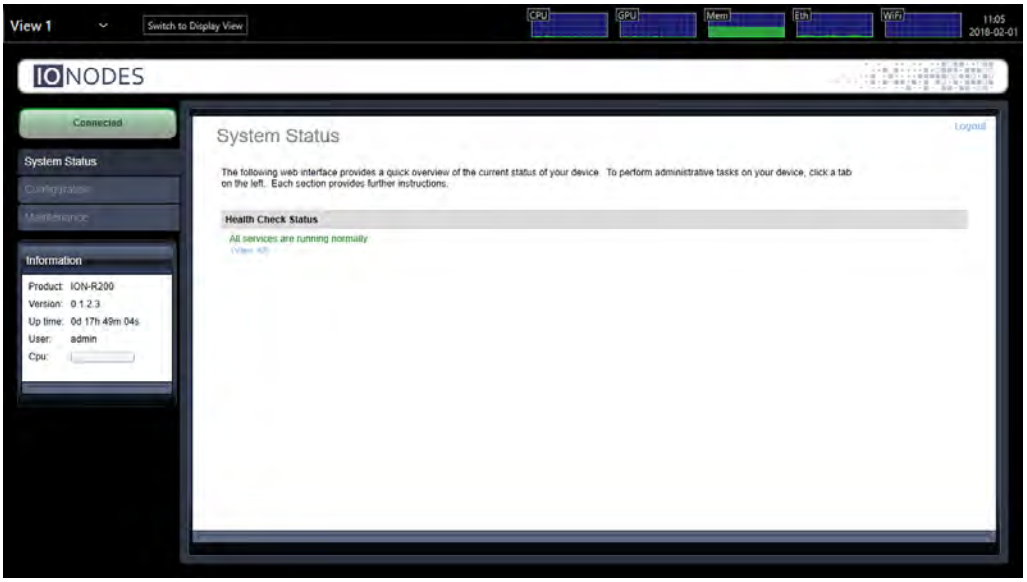
When the network configuration is set manually, the ION-R200 skips all the steps above and always uses the user-provided configuration. It is then the responsibility of the user to ensure that the network configuration in the ION-R200 is compatible with the computers and cameras on the network.

9.2 Setting Up the Initial Network Configuration Locally

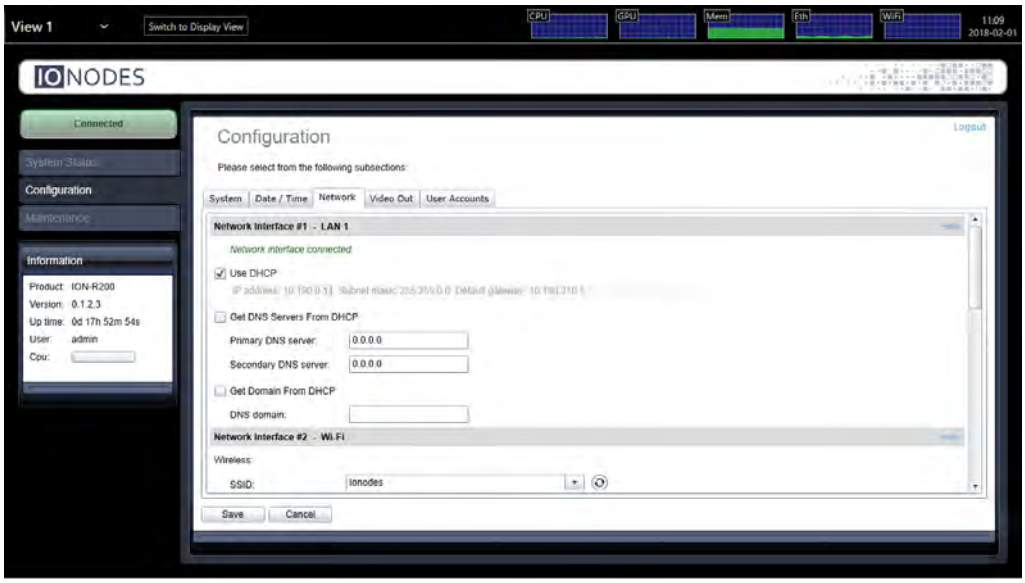
The configuration of the ION-R200 can be accessed on the device itself by switching to the configuration view.



To access the device's configuration, you must enter a valid username and password. The factory default user name and password are both '***admin***'. The following screen is then displayed:



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.

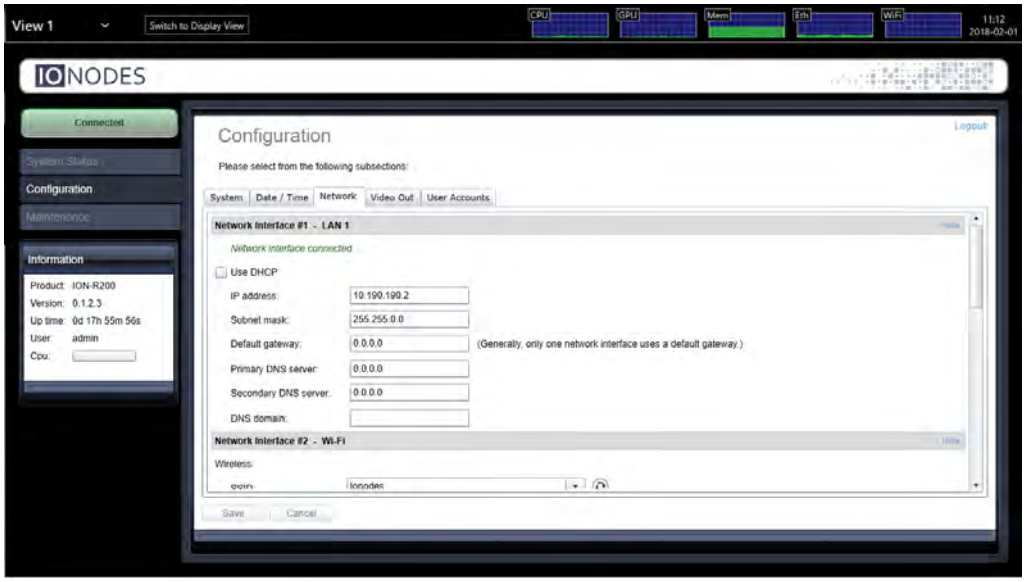


The Ethernet network configuration is shown in the first section ***Network Interface #1 – LAN 1***. The first information displayed is the connection status of the Ethernet cable. If the configuration reports the network interface as not connected, check the Ethernet cable between the ION-R200 and the network before proceeding.

By default, the ION-R200 is configured in DHCP mode. If a DHCP server is present on the network, the network configuration provided by the DHCP server is displayed. In that case, nothing needs to be done; the device is ready to communicate with computers and cameras on your network.

If the IP address shown is in the range 169.254.*.*, this means that the device could not obtain its network configuration from a DHCP server. In that case, the network configuration must be set manually.

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

9.3 Setting Up the 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.

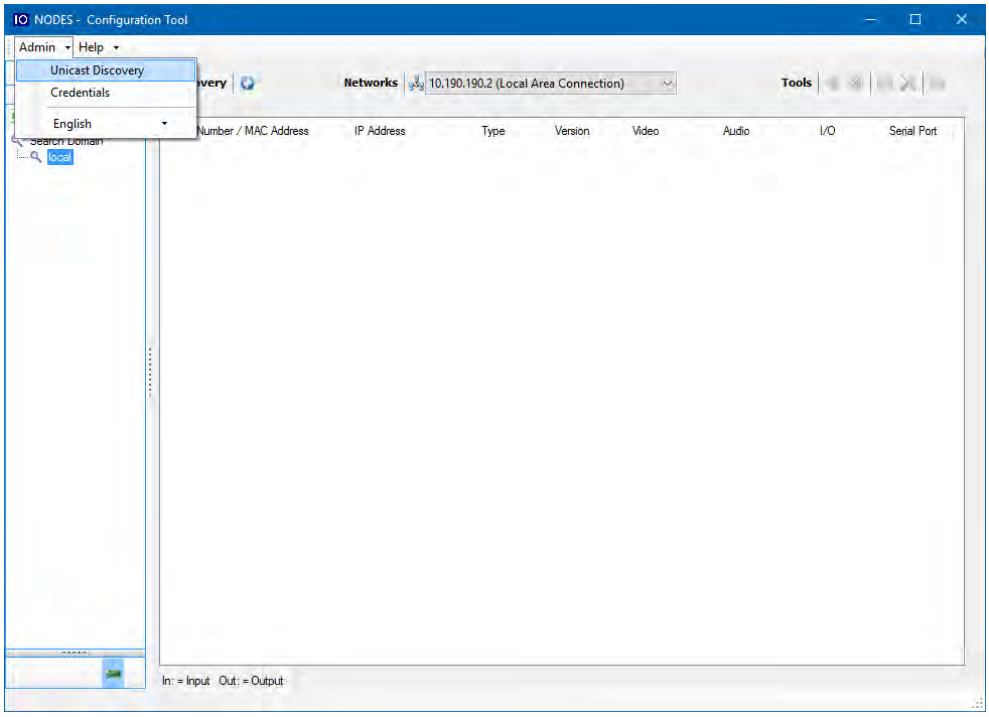
The ICT plays several roles:

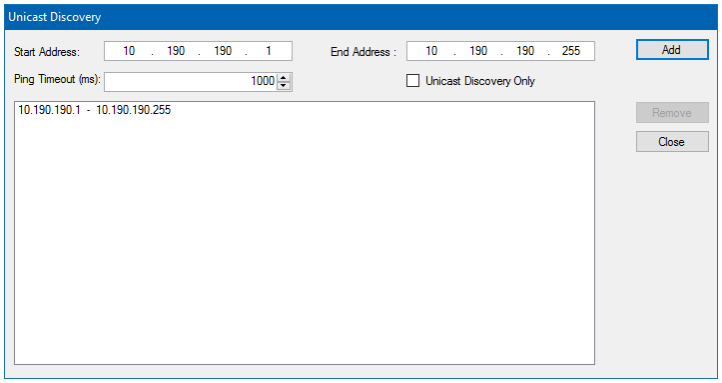
1. Discovery of all ION-R200 and other IONODES devices on the network
2. Remote configuration of the IP address and subnet mask
3. Applying batch firmware upgrade of all common IONODES devices
4. Accessing a device's web based management interface

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

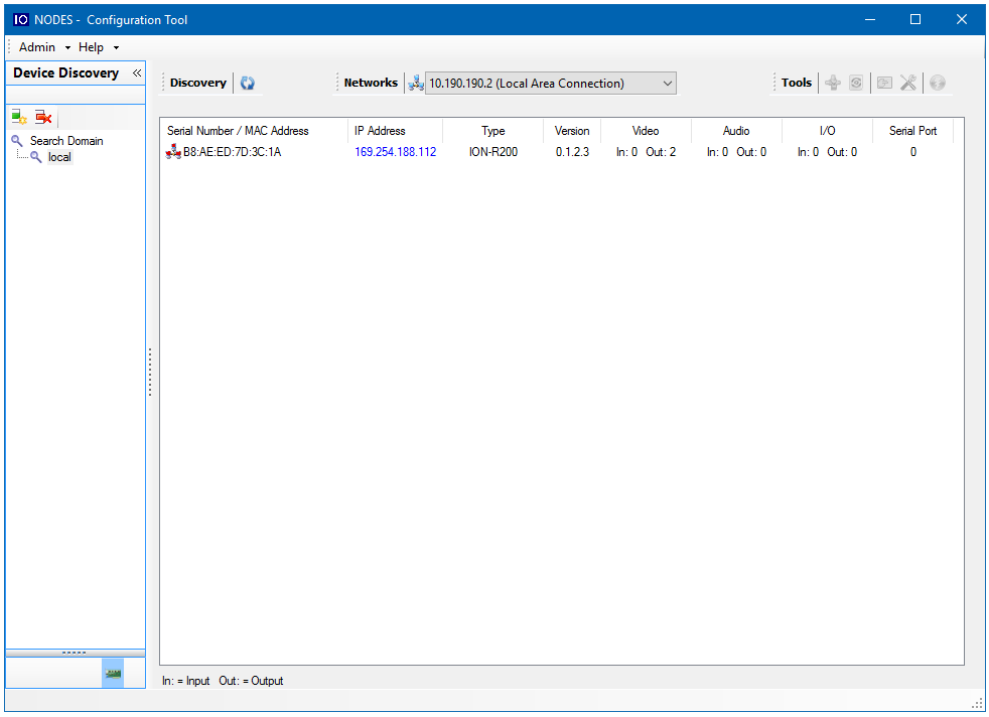
If multicast is not supported, you can use the second method: Unicast Discovery. Unicast Discovery can be configured by using the "Unicast Discovery" menu option under the Admin menu list.





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.

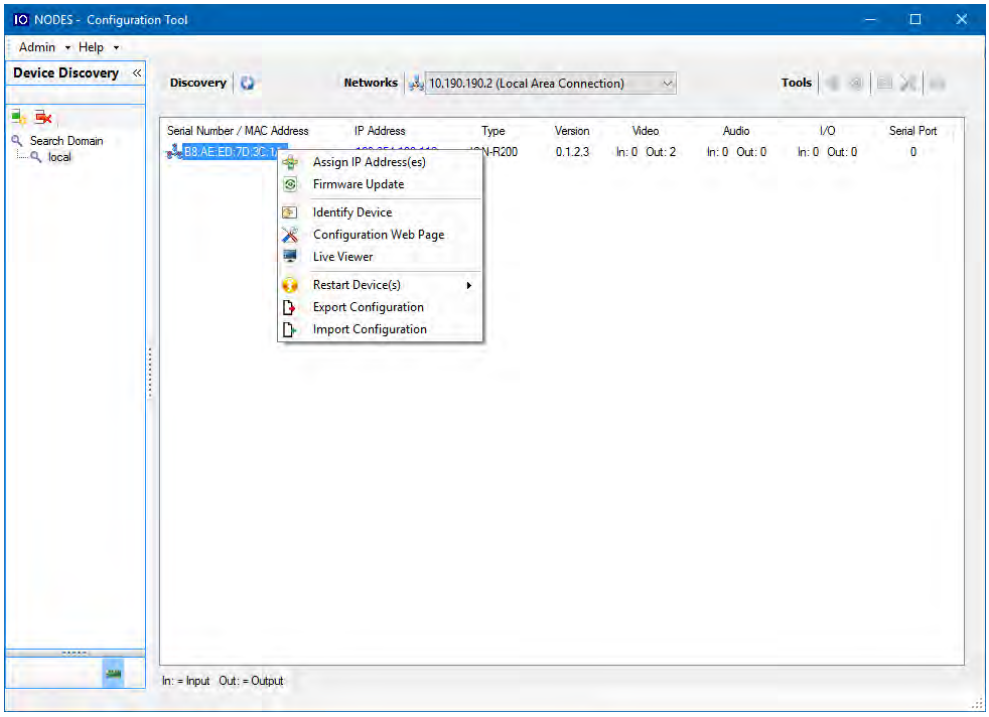
The ping timeout option can be increased for a high latency network.
The ICT will display as many devices as it discovers on the network.

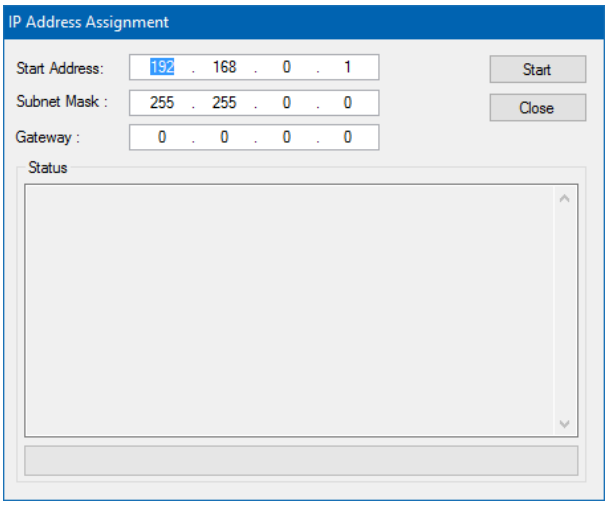


The ICT displays the current IP address of each detected device. If the device is configured in DHCP mode, its IP address appears in blue.

If a DHCP server is present on your network, it assigned an IP address to the device during the device's boot-up sequence.

If no DHCP server was able to assign an IP address to an ION-R200, it will appear in the ICT device list with an APIPA address (169.254.*.*). If an ION-R200 displays an APIPA address it must be configured with a valid IP address before it can be used on the network. Select the ''Assign IP address'' from the selection list and apply the desired TCP/IP settings to the device.





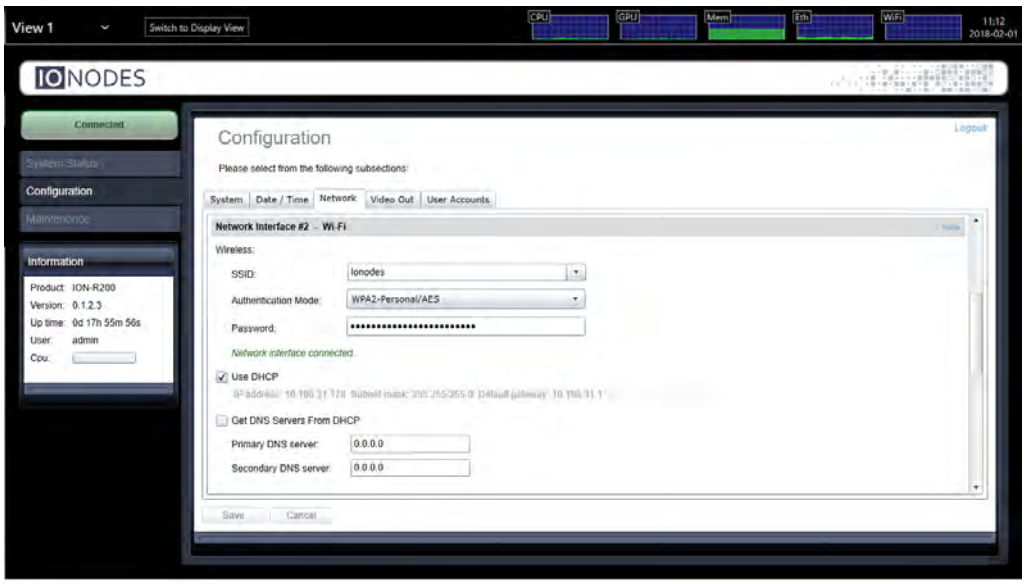
Once the network settings are set, the web-based configuration interface of the ION-R200 can be launched from the ICT or directly in your web browser by typing the device's IP address in the address bar.

9.4 Setting Up the Wireless Network

The ION-R200 can also connect to wireless networks. In the ***Configuration*** page, select the ***Network*** tab and scroll down to the section named ***Network Interface #2 – Wi-Fi***.

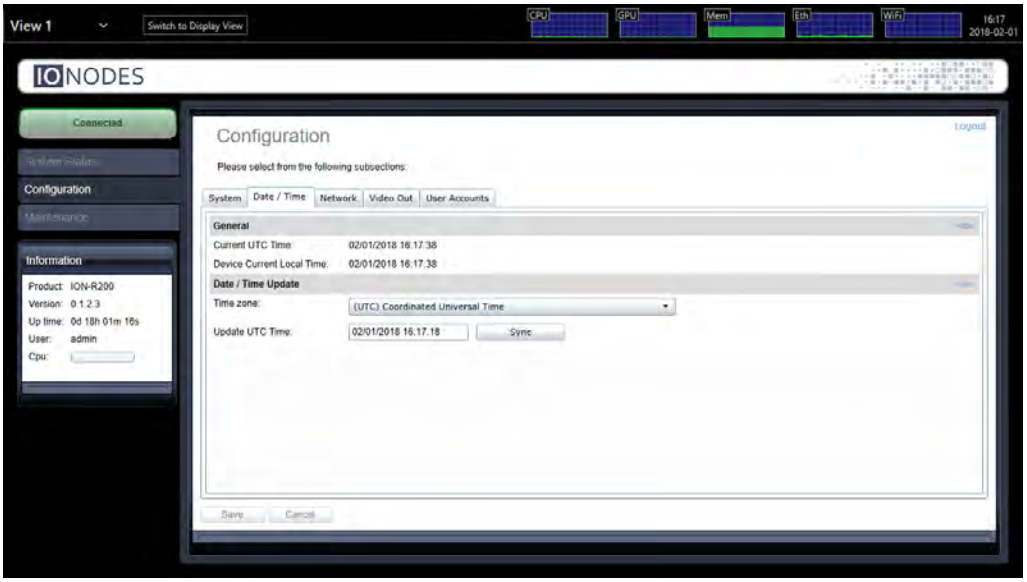
The ***SSID*** field represents the name of the wireless network. The ION-R200 automatically detects available wireless networks; simply select from the list the wireless network to which you want to connect. Enter the password protecting the wireless network and click on the ***Save*** button at the bottom.

Once the wireless settings are filled, configuring the remaining settings works exactly like configuring the Ethernet network interface (see section 9.2).

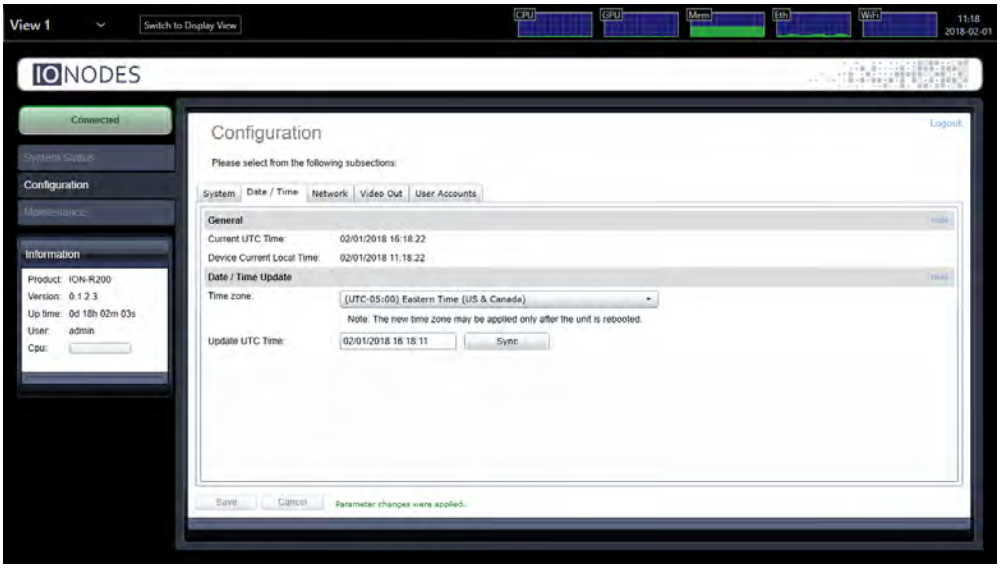


9.5 Setting Up the Time

In the ***Configuration*** page, select the ***Date/Time*** tab.



To set the time zone in the device, select the appropriate value from the list in ***Time zone***. To set the current time in the device, enter the new UTC time in ***Update UTC Time***. If you are configuring the time remotely from a computer, clicking on ***Sync*** automatically uses the current UTC time of the computer.



Click the ***Save*** button to apply the changes.

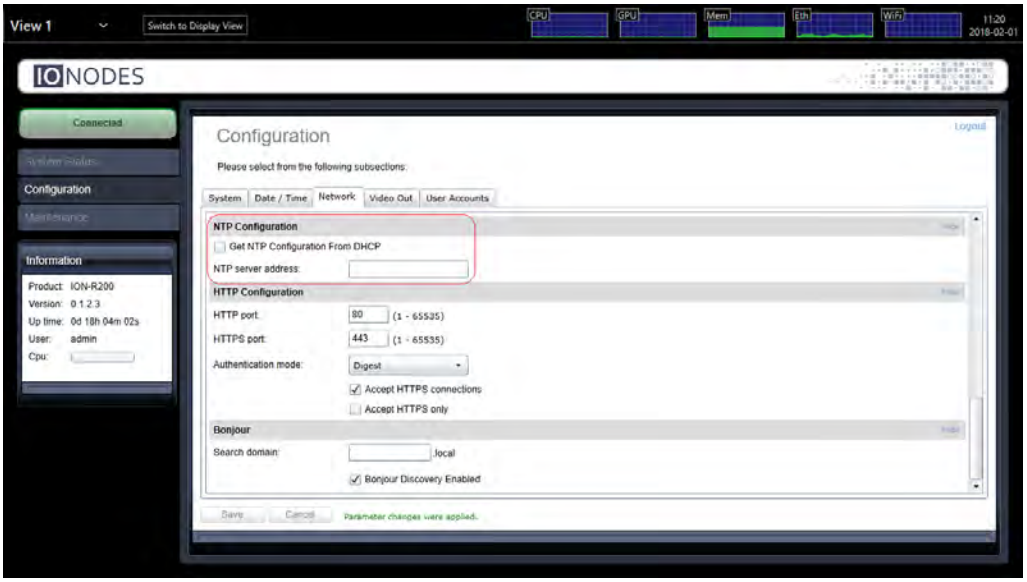
Note: Changing the time zone requires the device to be rebooted before the change takes effect.

9.5.1 Setting Up the NTP time server

Some networks use a time server, also named NTP time server (Network Time Protocol). The role of a time server is to synchronize the time for all devices on the network. The ION-R200 can be configured to use such a time server to synchronize its internal clock.

In the ***Configuration*** page, select the ***Network*** 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.

If the device is configured in DHCP mode and the DHCP server is set up to provide the address of the NTP time server, you can check ***Get NTP Configuration From DHCP***. Click the ***Save*** button to apply the changes.



9.6 Video Configuration Concepts

In the ***Configuration*** page, then select the ***Video Out*** tab. The video configuration is divided in 4 sub-tabs:

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

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-R200 supports up to 32 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-R200 supports up to 32 separate OSD configurations.

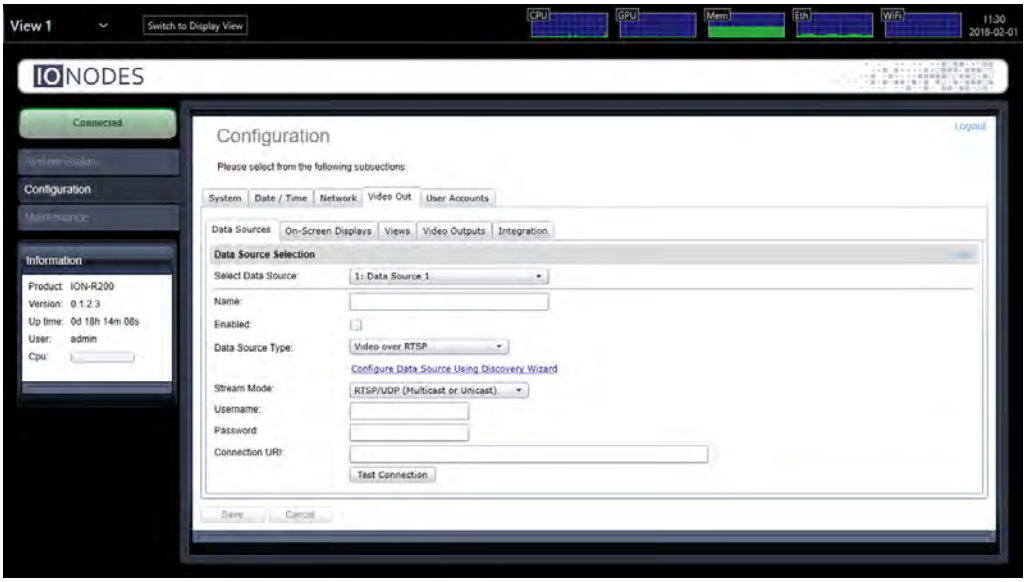
Views determine how you want to group and display data. For example, if you wanted to display video from all the building entrances on one screen in a 2x2 layout, you could configure a view to do so. The ION-R200 supports up to 5 separate views.

Finally, display outputs contain the configuration specific to each TV or monitor connected to the ION-R200, like the display resolution for example. The ION-R200 supports up to two display outputs (one HDMI and one Mini DisplayPort).

9.7 Configuring Video Connections

9.7.1 Video over RTSP Data Sources

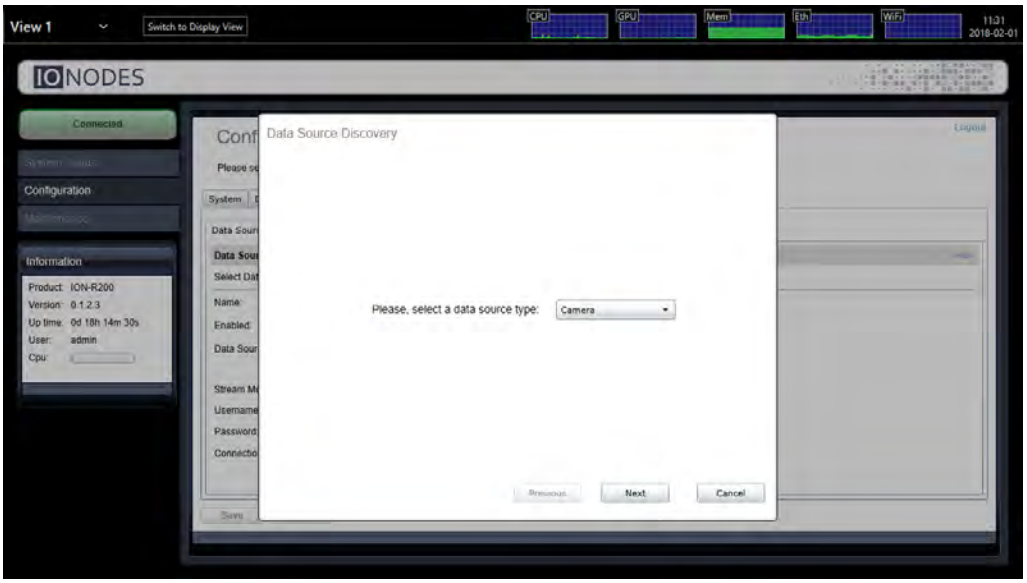
In the ***Configuration*** page, select the ***Video Out*** tab, then the ***Data Sources*** sub-tab. After that, select the data source you want to configure. To configure an RTSP video connection, set ***Data Source Type*** to *Video over RTSP*.



To connect to a video stream, the ION-R200 needs to know the **Connection URI** and **Stream Mode**, as well as any **Username** and **Password** required by the camera or encoder. If you know the exact connection URI of the video stream, you can type it in manually. Or you can use the discovery wizard by clicking on *Configure Data Source Using Discovery Wizard*. The discovery wizard guides you through a few simple steps in order to fill the data source configuration for you.

Step 1 – Data Source Type

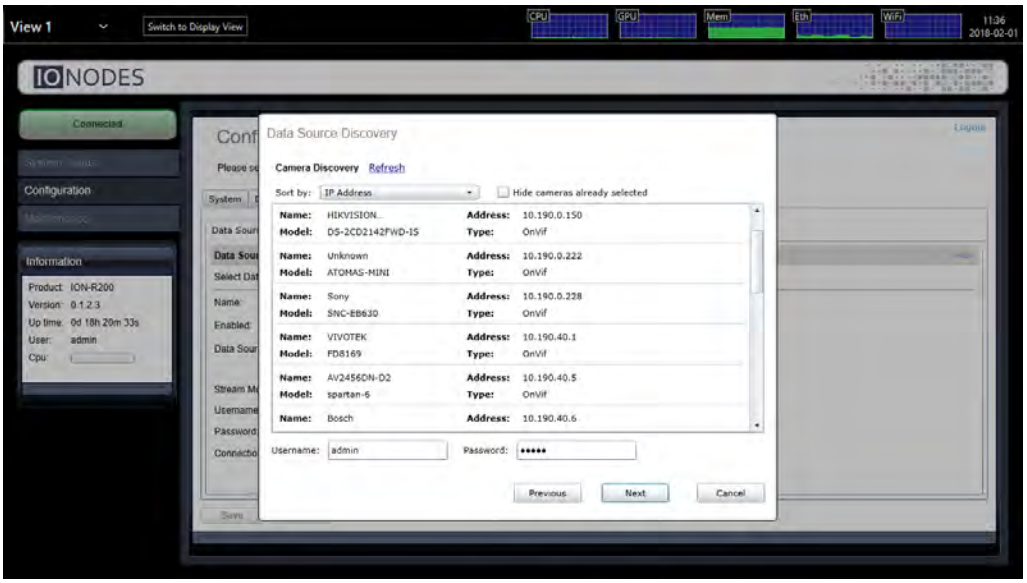
In the first step of the discovery wizard, set the type of data source to configure to ***Camera*** and press ***Next***.



The wizard then displays a list of all cameras and encoders 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 Discovery

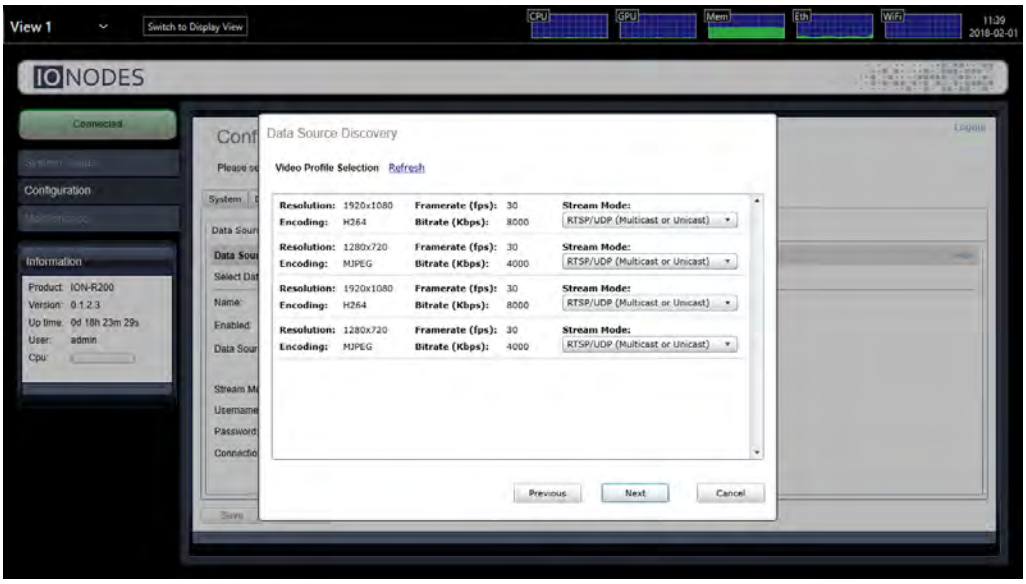
Select the camera you want by clicking on the desired entry in the list. Then, enter the ***Username*** and ***Password*** required to connect to the camera. Press the ***Next*** button.



Step 3 – Video Profile Selection

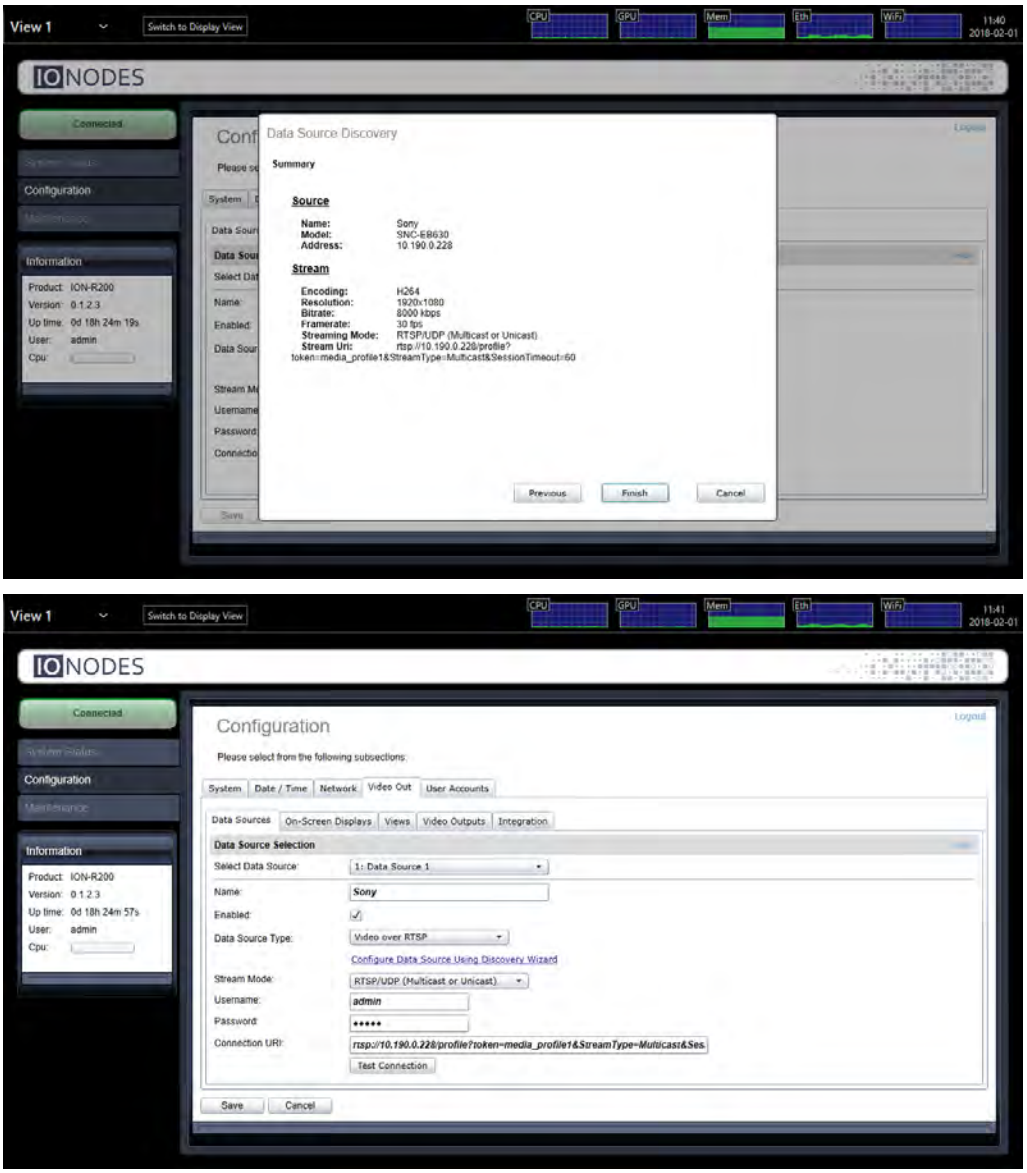
In this step, the wizard displays a list of all video streams available from the camera that are supported by the ION-R200. Click on the desired video stream. The **Stream Mode** field shows a list of network connections supported by the camera. Select the desired streaming mode and press ***Next***.

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



Step 4 – Summary

Here the wizard displays the details of the video stream you have selected. To confirm that this is the video stream that you want, click on ***Finish***. 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-R200 connects to a video stream ONLY when that video stream is displayed. Enabling a data source indicates that the ION-R200 can establish this connection when needed, not that it needs to do so right away. Disabling a data source prevents the ION-R200 from connecting to the video stream for any reason.

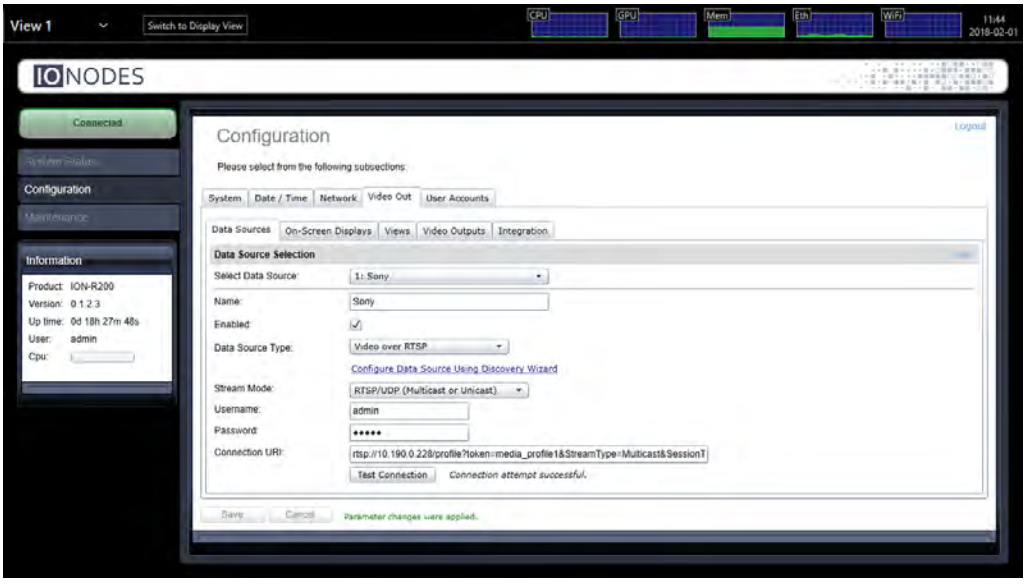
Note: A video data source creates a single connection. Even if the video is played on two different outputs at the same time, the video stream is captured only once.

9.7.1.1 Testing a connection

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

Possible results are:

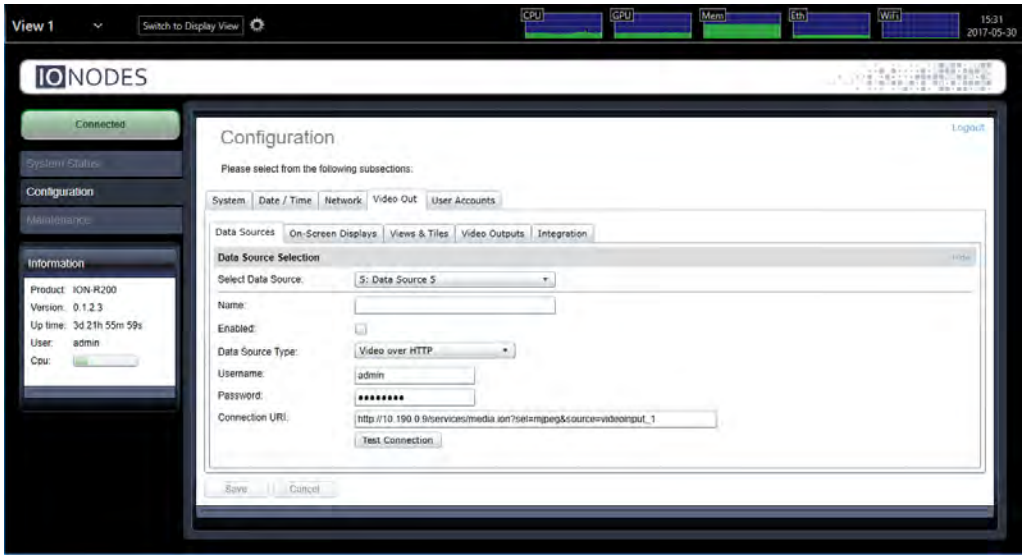
- **Connection attempt successful.**
  No error was reported while testing the connection.
- **Connection attempt timed out.**
  Tried to connect to the camera but got no answer. The camera may be temporarily offline, else it is unreachable.
- **Connection attempt refused by remote.**
  The connection 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.

9.7.2 Video over HTTP Data Sources

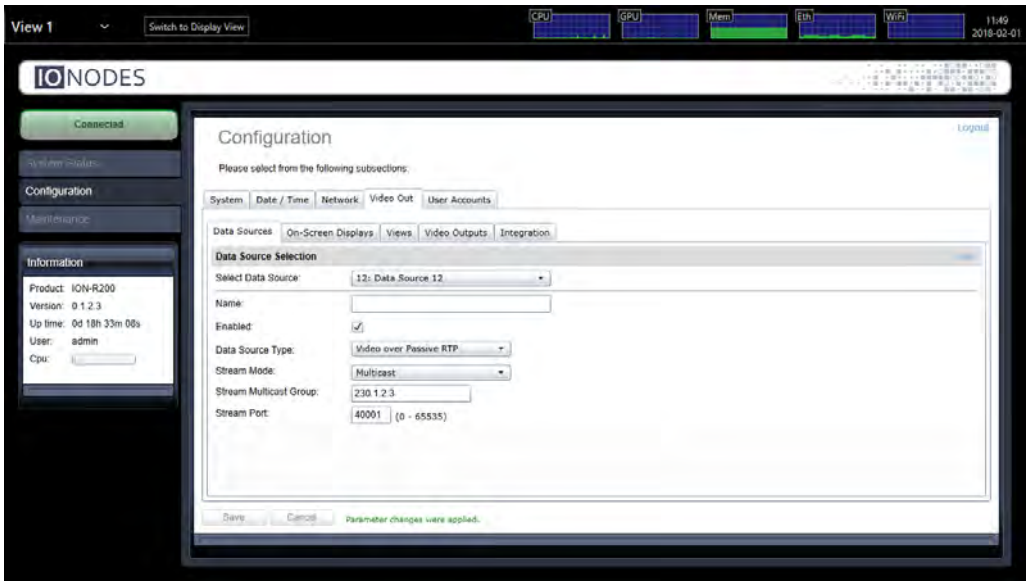
To configure an MJPEG over HTTP video connection, set ***Data Source Type*** to *Video over HTTP*. There is no standardized method to query the list of available HTTP video streams in a camera and thus the discovery wizard cannot be used to configure the data source. You have to enter the **Connection 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.



9.7.3 Video over Passive RTP Data Sources

Some legacy video systems use 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**.

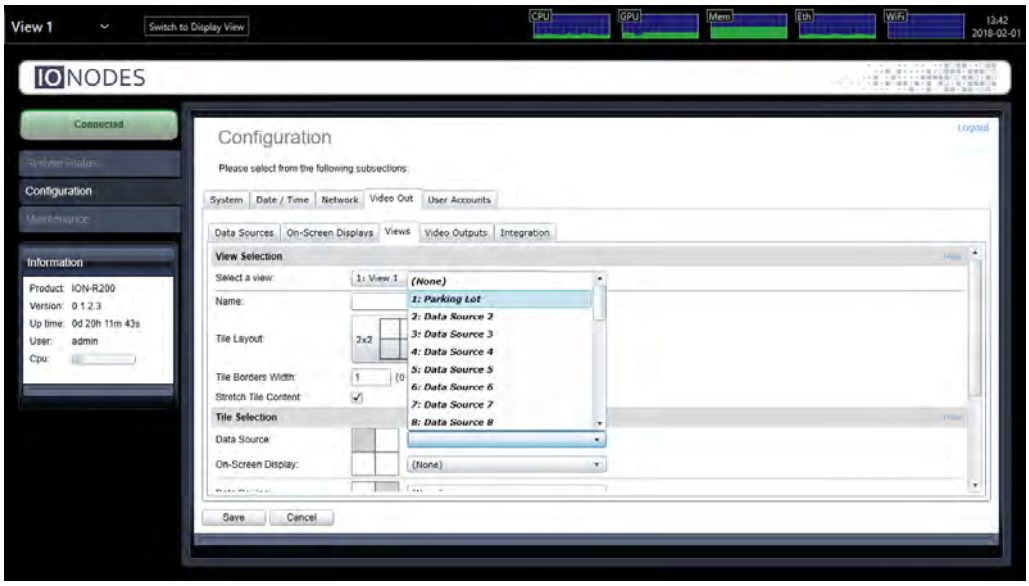


9.7.4 Displaying a Data Source

Now that we have configured an RTSP video data source, the next step is to display it. In the ***Configuration*** page, select the ***Video Out*** tab, then the ***Views*** sub-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 9.9. For now, scroll down to the ***Tile Selection*** 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.

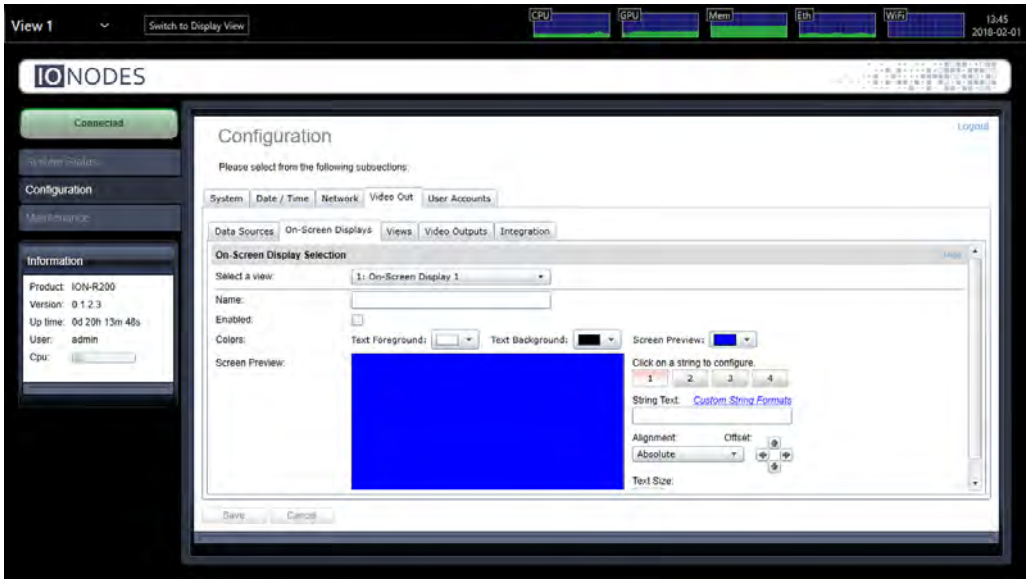


If you are configuring the ION-R200 from your computer through the device's web interface, the video is now displayed. If you are configuring the ION-R200 locally, click on ***Switch to Display View*** at the top of the screen to view the video.

9.7.5 On-Screen Displays

In the ***Configuration*** page, select the ***Video Out*** tab, then the ***On-Screen Displays*** sub-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.

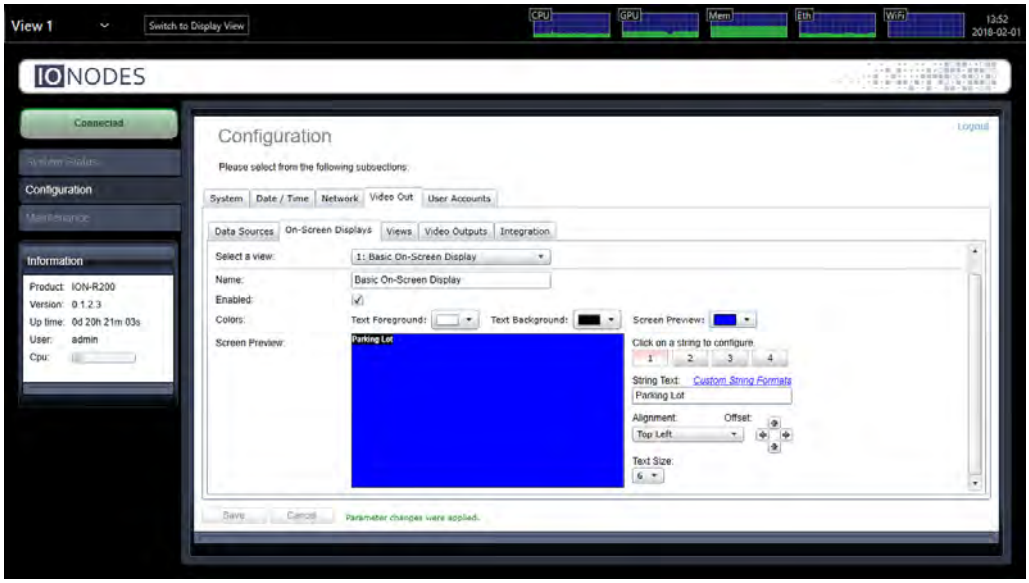


Click on ***Text Foreground*** to select the color of the OSD text. In the same fashion, click on ***Text Background*** to select the background color for the OSD text.

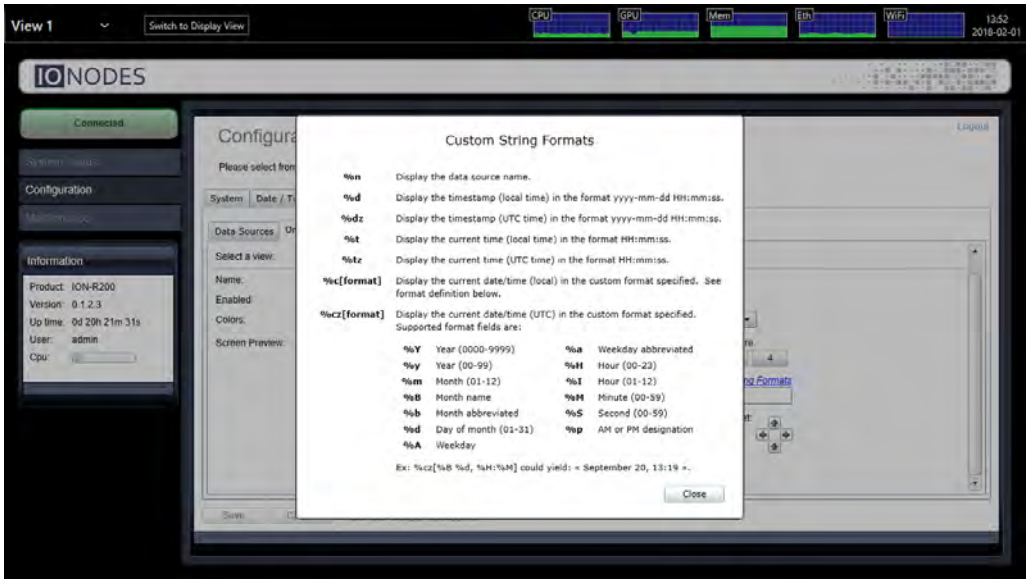
On the right side of the preview is where you configure each OSD string. Click on the button ***1*** to configure the first OSD string. In ***String Text***, type in the text to display. ***Alignment*** lets you select where to anchor the text (ex: top left corner). Use the ***Offset*** arrows if you want to move the text around that anchor. Finally, ***Text Size*** lets you select how big to display the text.

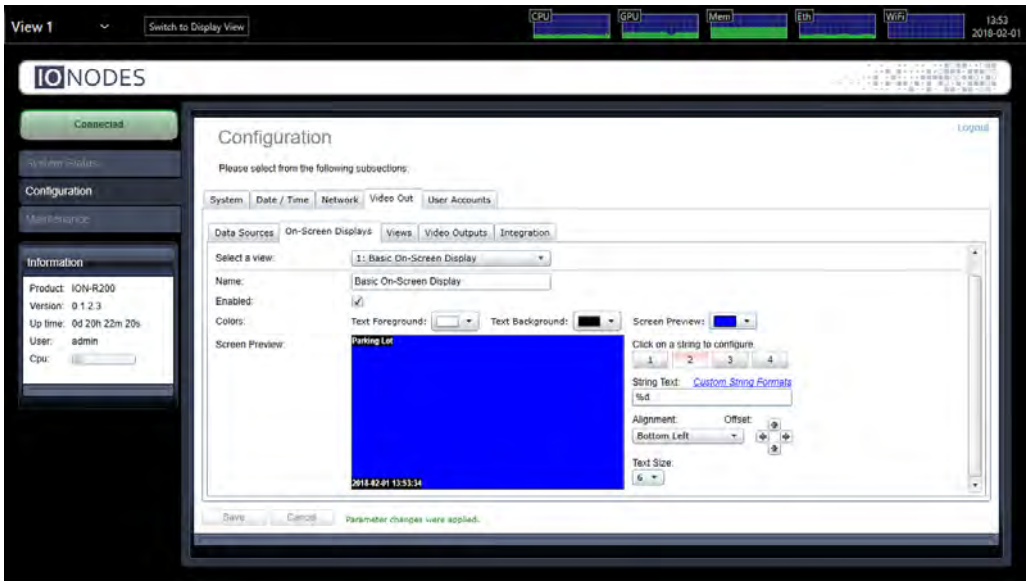
Ton configure other OSD strings, click on ***2***, ***3*** or ***4*** and set the appropriate text, alignment and size.

Note: The ION-R200 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-R200 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.



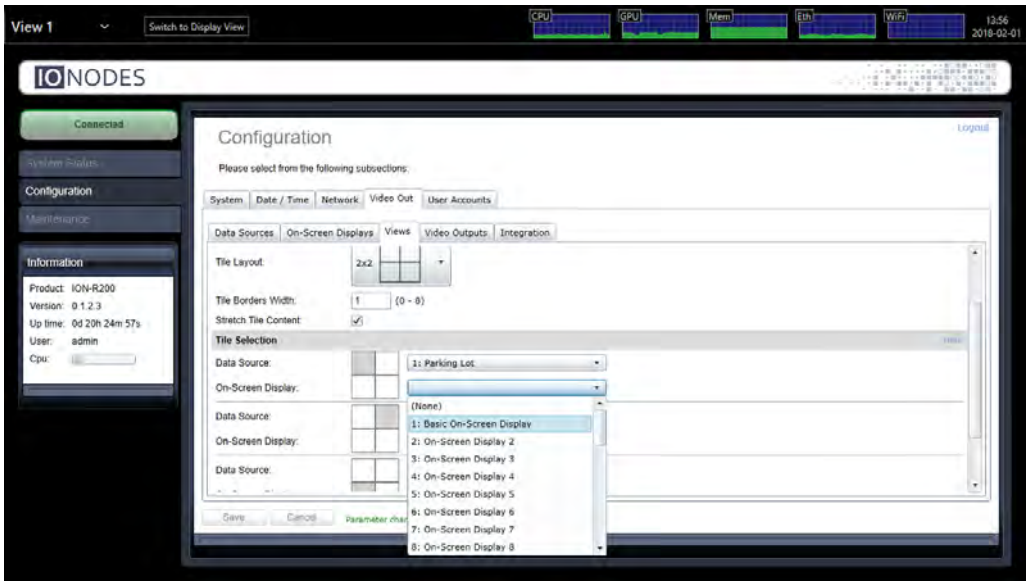


Note: Using custom OSD strings allows for greater flexibility. For example, displaying "Parking Lot" in your OSD makes sense only for the camera pointed at the parking lot. Instead, using "%n" (data source name) allows creating one OSD and displaying it over all your video streams.

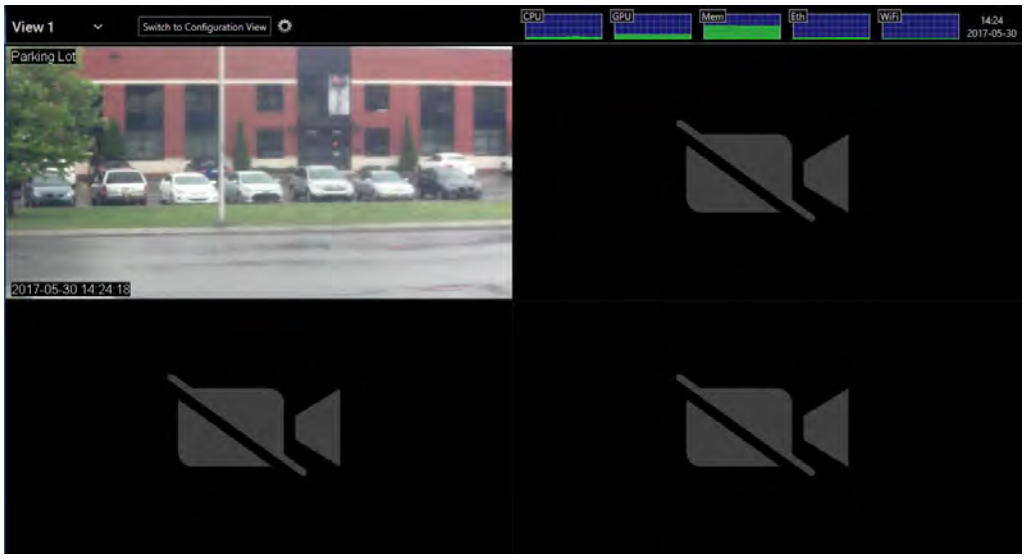
9.7.6 Displaying an On-Screen Display

In the ***Configuration*** page, select the ***Video Out*** tab, then the ***Views*** sub-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.



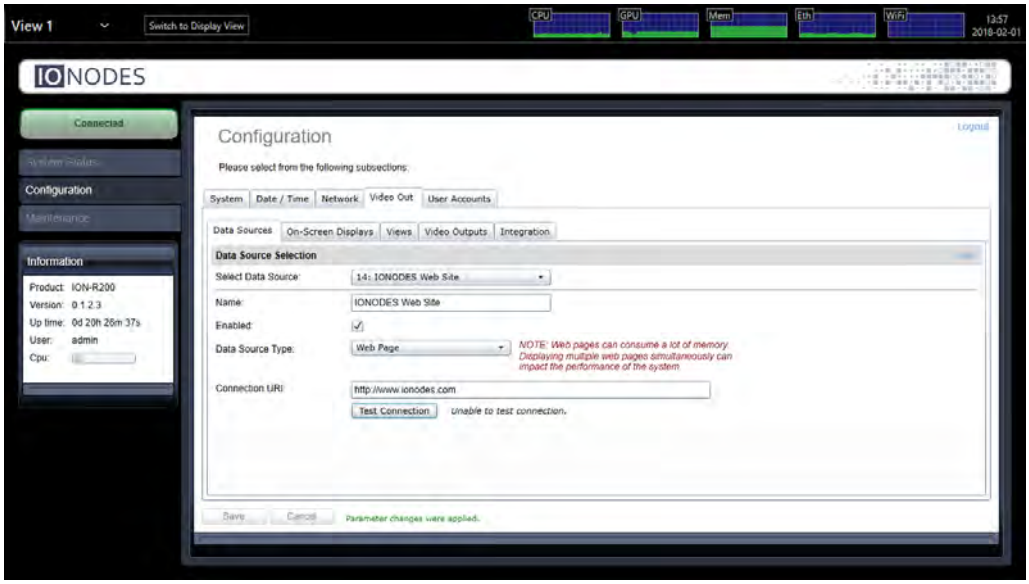
If you are configuring the ION-R200 from your computer through the device's web interface, the OSD is now displayed over the video. If you are configuring the ION-R200 locally, click on ***Switch to Display View*** at the top of the screen.



9.8 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*.

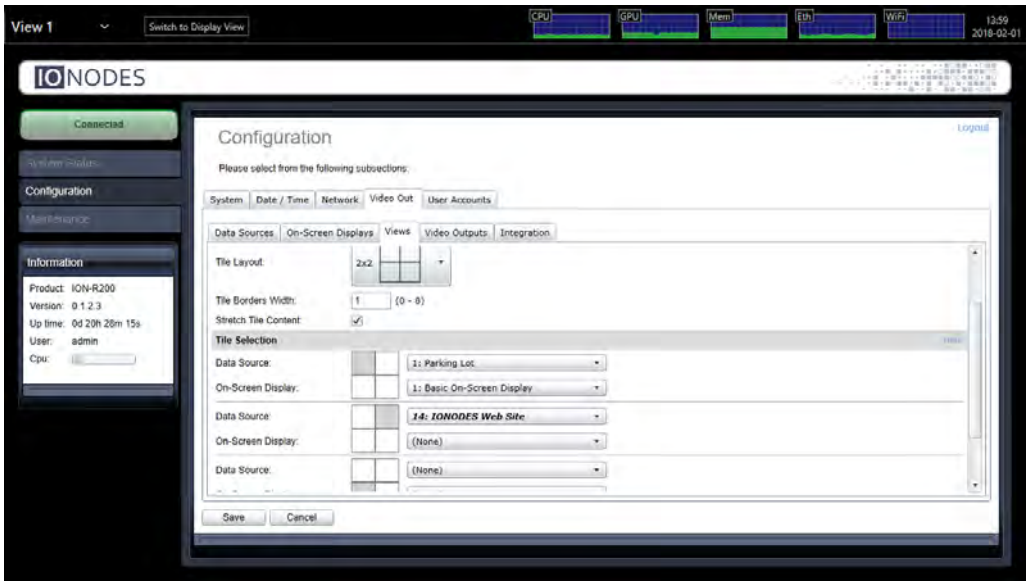
Type in the address of the web page in ***Connection URI***. Type in a name (optional) for the data source, check ***Enabled*** to enable this data source and press ***Save*** at the bottom to save the new configuration.

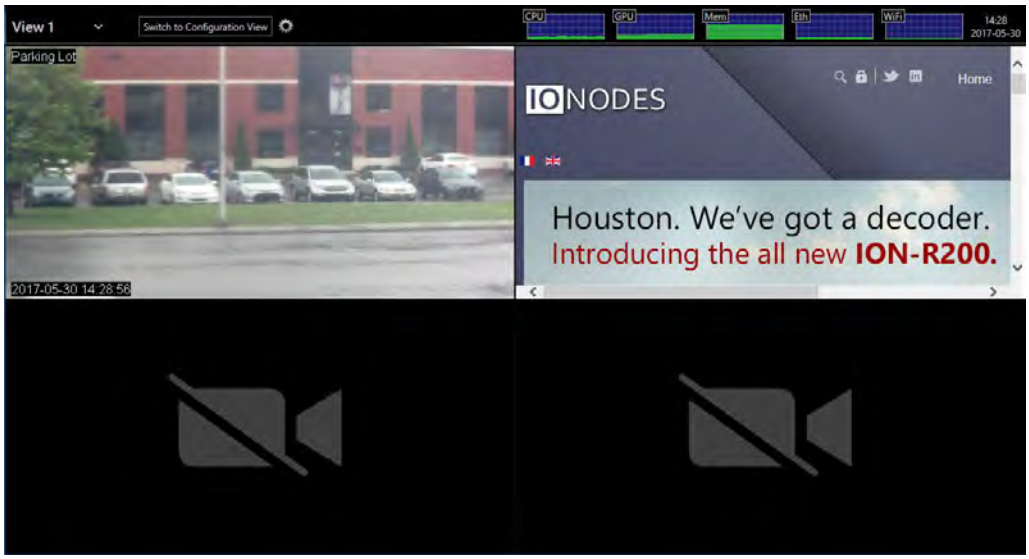


Note: The ION-R200 connects to a web page ONLY when that web page is displayed. Enabling a data source indicates that the ION-R200 can establish this connection when needed, not that it needs to do so right away. Disabling a data source prevents the ION-R200 from connecting to the web page for any reason.

To display the web page, we need to add it to a view. In the ***Configuration*** page, select the ***Video Out*** tab, then the ***Views*** sub-tab. Scroll down to the ***Tile Selection*** 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.





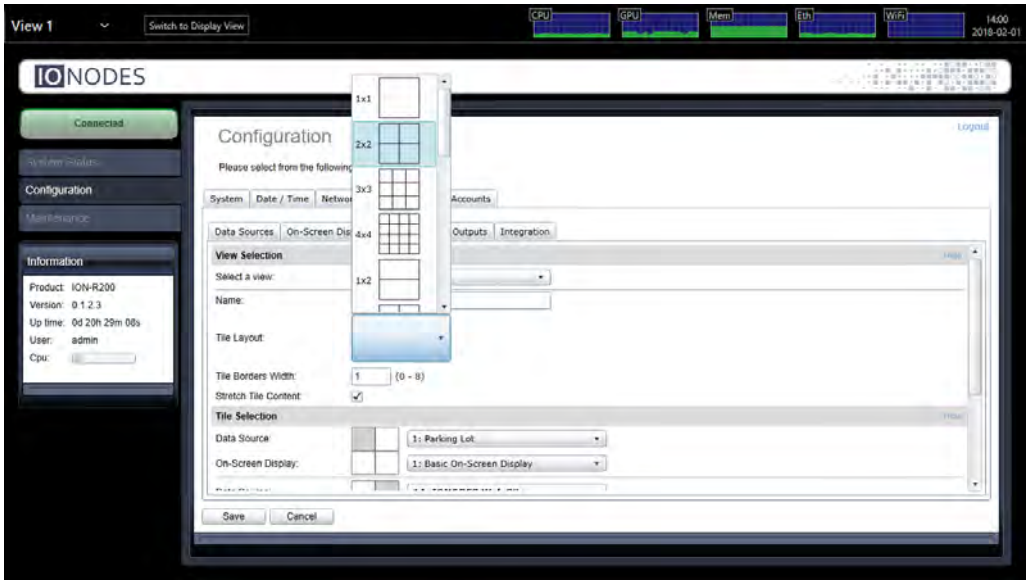
Warning: Modern web pages are often filled with highly dynamic media content. Displaying such content require a lot of resources. Displaying multiple web pages WILL affect the video decoding performance of the ION-R200.

9.9 Configuring Views

In the ***Configuration*** page, select the ***Video Out*** tab, then the ***Views*** sub-tab.

Views have the following configuration:

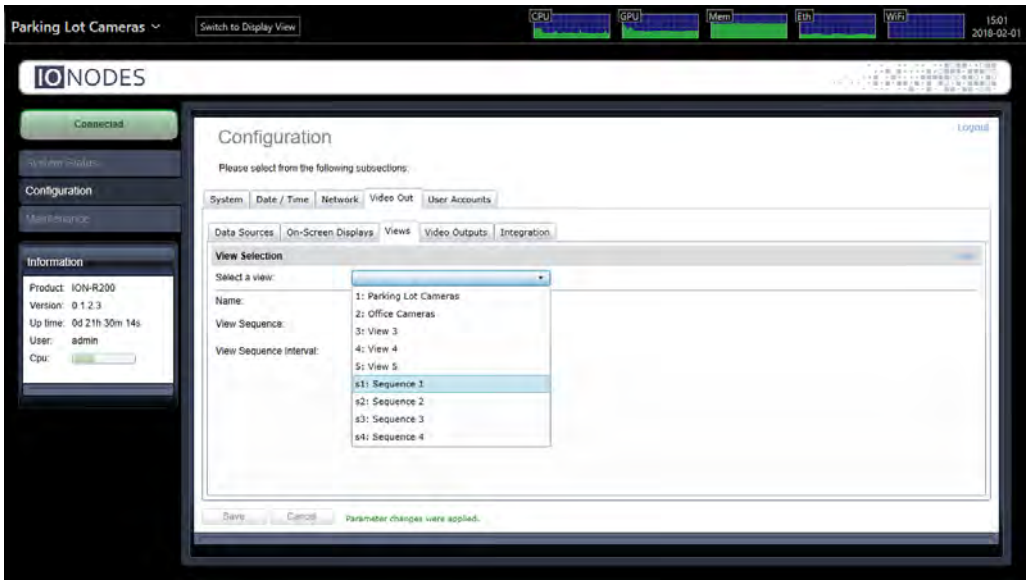
- **Name**
  User friendly name. Also displayed in the view selector in the top-left corner of the screen.
- **Tile Layout**
  Views display content in one or more tiles. The tile layout dictates how many tiles to display as well as how to organize these tiles.
- **Tile Border Width**
  Determines the 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 determine whether the video is stretched to fill the entire tile or scaled to fit inside.



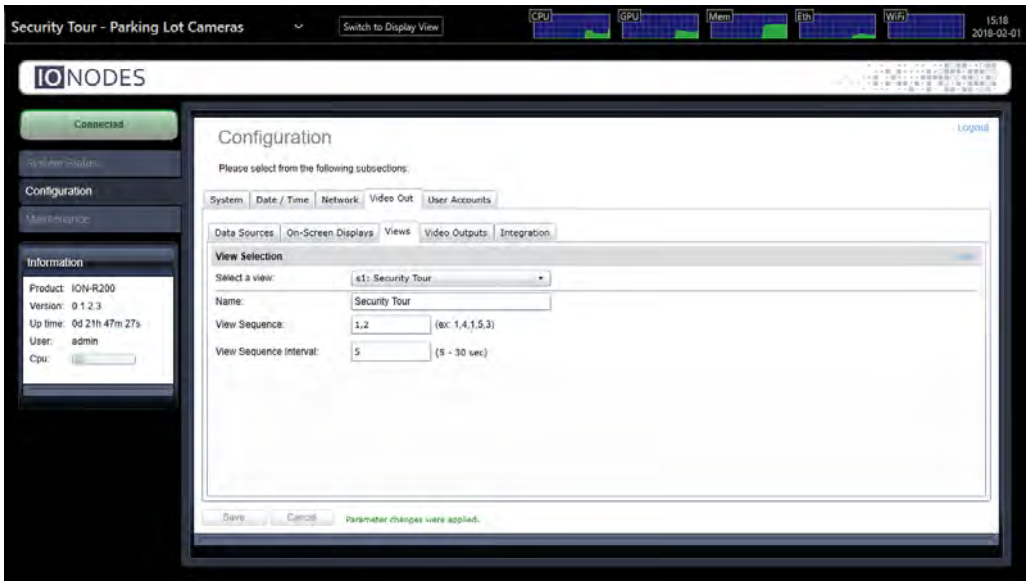
Note: Stretching the content of a video tile can visibly deform the video, as shown in the images below. Web pages simply adjust their layout based on the available space, so they are generally not affected in the same way.

9.10 View Sequences

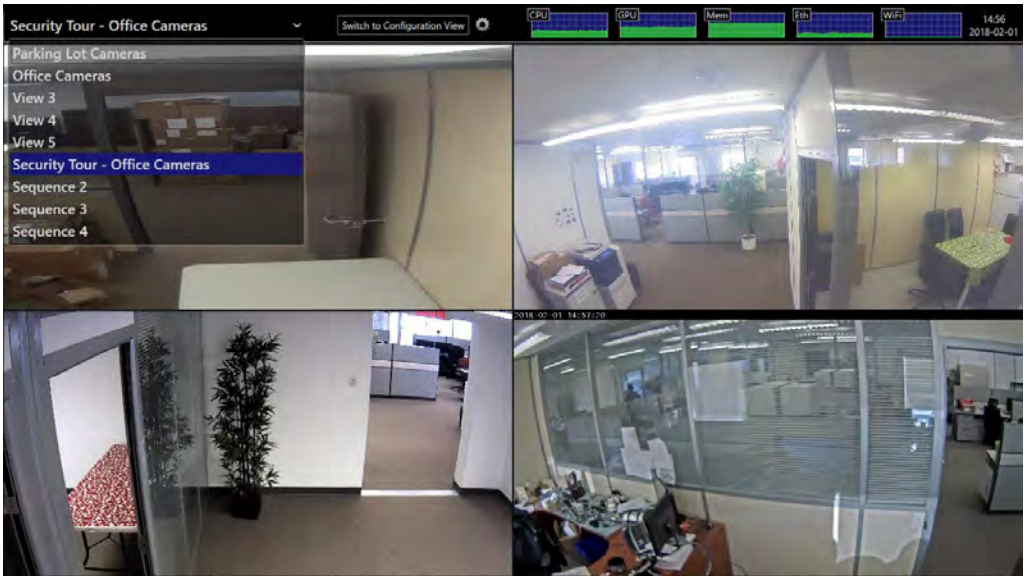
Once you have configured two or more views to display your various video streams, you can configure the ION-R200 to cycle through each of your views automatically on a timer.



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 each view will be displayed. Select a name for the view sequence (optional) and click on **Save** to save the configuration.



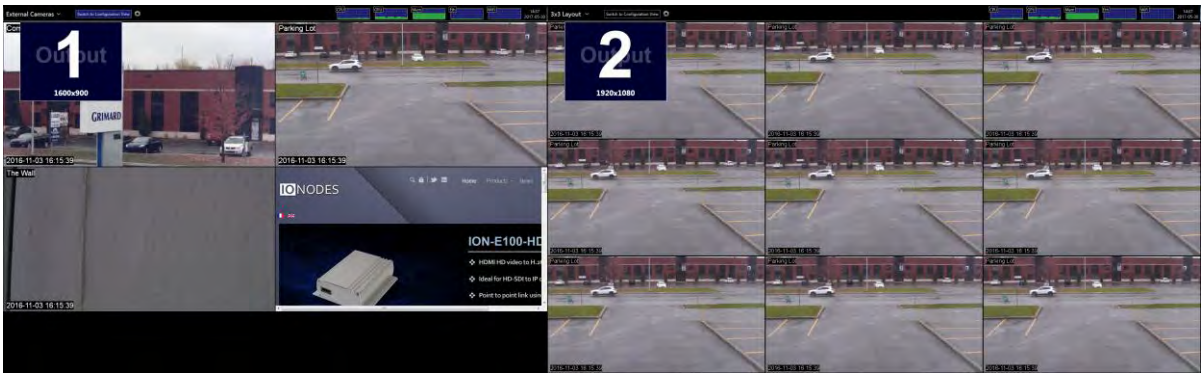
Back in Display Mode, you can now select the view sequence start the sequence. When a view sequence is selected, the name of the view currently displayed will also be shown.



9.11 Configuring Video Outputs

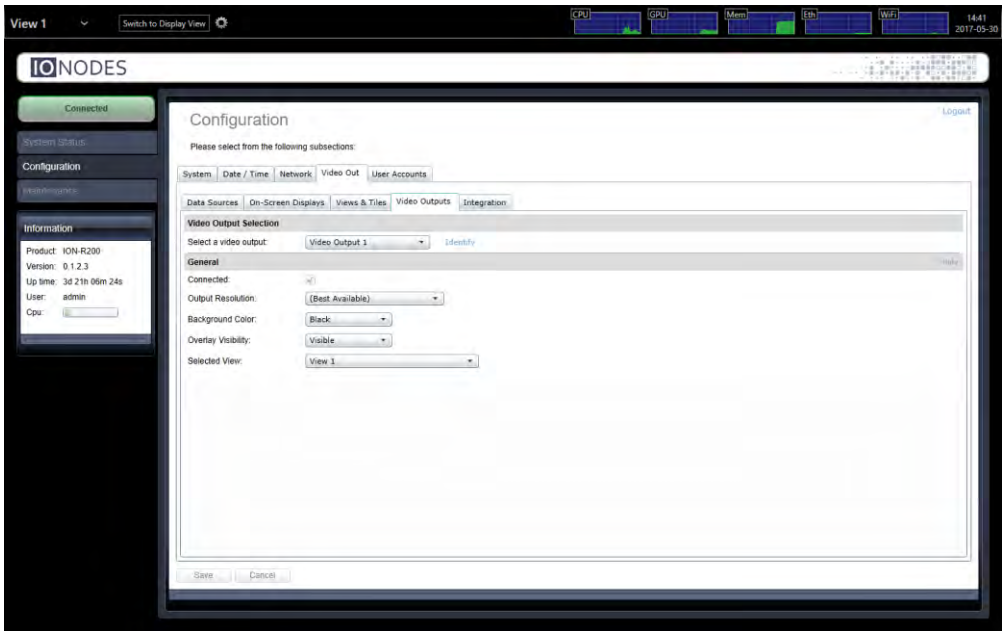
In the ***Configuration*** page, select the ***Video Out*** tab, then the ***Video Outputs*** sub-tab.

When a single display is connected to the ION-R200, that display is always referred to as *Display Output 1* regardless of the connector (HDMI or Mini DisplayPort) the display is connected to. If there are two displays connected to the ION-R200, click on *Identify* to determine which is *Display Output 1* and which is *Display Output 2*.

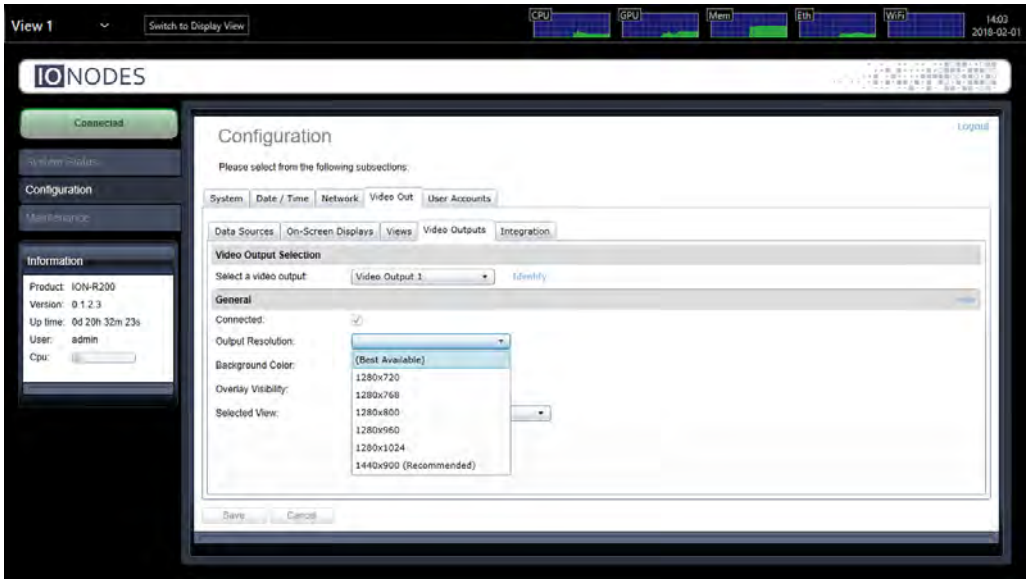


The configuration of each display output is as follows:

- **Connected** (read only)
  Indicates whether the display output is connected to a physical display.
- **Output Resolution**
  Determines the display resolution to use for this output. See below for details.
- **Background color**
  Determines the background color for empty tiles.
- **Overlay Visibility**
  The overlay is the utility bar at the top of the screen. The overlay can be displayed at all times 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.



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-R200 is connected to two displays and you disconnect *Display Output 1*, the other display automatically becomes *Display Output 1*. *Display Output 2* is then considered disconnected. A common mistake is to try to configure a disconnected output.

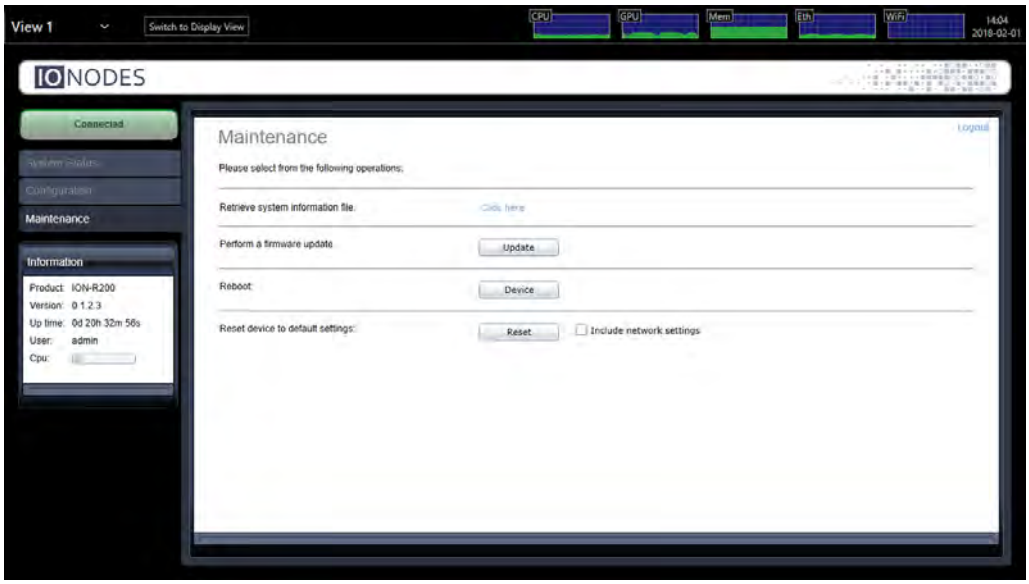
Use the *Identify* feature to make sure you are configuring the right display.

If you disconnect a display, the ION-R200 remembers 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.

10 Performing a Firmware Update

This section describes how to update your ION-R200 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.



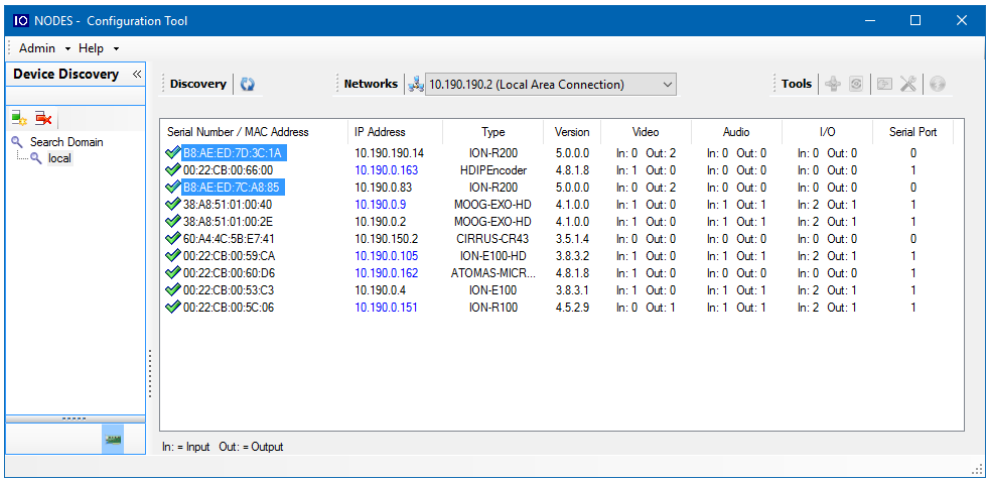
5. You will see the following messages indicating the status of the update:
   - Firmware upload in progress... (100%)
   - Firmware uploaded. Saving to internal storage... (0%)
   - Validating and decompressing firmware... (0%)
   - Firmware ready for installation. Rebooting device... (0%)
     - Web 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... (26%)
     - Lasts 120 seconds.
   - Firmware update complete. (100%)

10.1 Batch Firmware Update

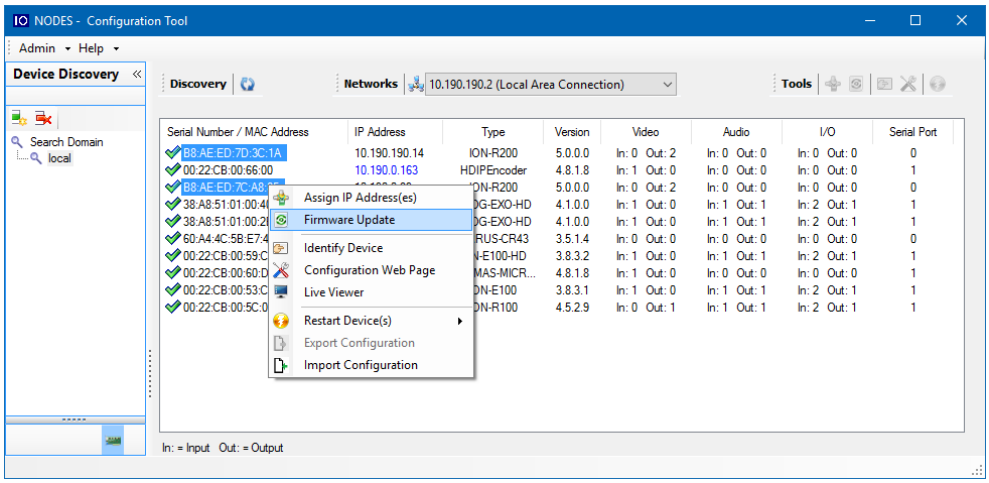
This section describes how to perform a batch update of multiple ION-R200 devices to newer firmware versions from the ION Configuration Tool (ICT).

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.

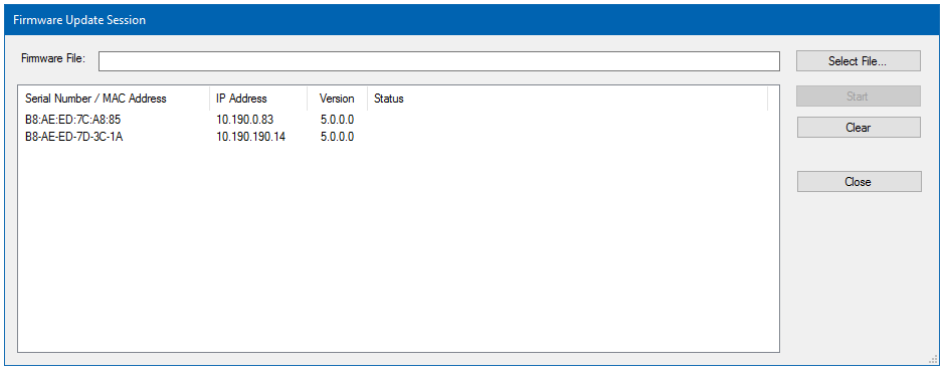
From the ICT, select one or more ION-R200 devices.



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.

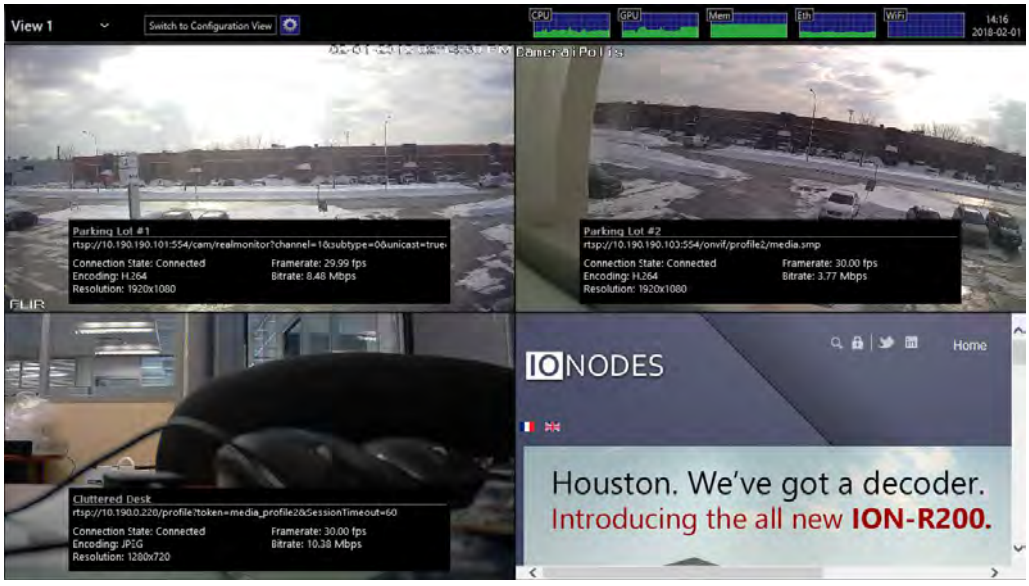
11 Diagnostics

11.1 View Stream Details

In order to help diagnose connectivity or performance problems, the ION-R200 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)



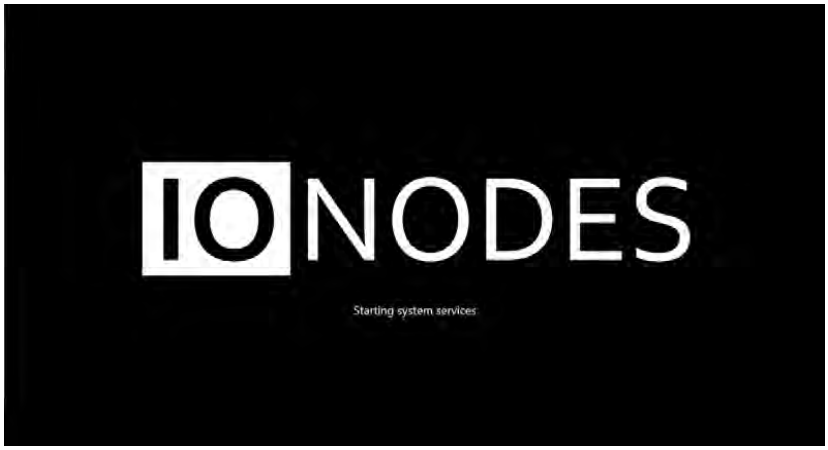
11.2 Safe Mode

It is possible to configure the ION-R200 in such a way that there is just too much video to decode. 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-R200 may run at maximum capacity and it may not be enough to decode all the video. In such a scenario, the ION-R200 may become increasingly unresponsive, thus preventing access the configuration of the device in order to fix the problem.

It is also possible that a video stream from a third-party camera may not strictly follow the H.264 video encoding standard, causing problems in the ION-R200 while decoding the video stream.

For all scenarios where the device becomes uncooperative, the ION-R200 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-R200 is booting up, wait for the device to reach the step shown in the image below:



While the ION-R200 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-R200 to start the system services and safe mode can be enabled only during that step of the boot-up sequence. If the device