

SILENT SENTINEL ARE SPECIALISTS IN LONG RANGE  
OPTICAL SENSORS INCLUDING BOTH COOLED AND  
UNCOOLED THERMAL CAMERAS



## Silent Sentinel IP Encoder User Guide

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Date: 06/08/2021



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This manual is used as a guide. The photos, graphics, diagrams, and illustrations provided in the manual are only used for explanation, which may be different from the specific product. Please refer to the actual product. We try our best to make sure all the contents in this manual are accurate. We do not provide any representations or warranties in this manual.

If you need the latest version of this manual, please contact us. Silent Sentinel recommends that you use this manual under the guidance of professionals.

## Version Control

<b>Version</b>	<b>Author</b>	<b>Approver</b>	<b>Date</b>
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## General Notes

The below guide references generic information regarding the video encoders. For actual IP addresses, usernames and passwords of the delivered system please refer to the Final Test Reports.

## System Configuration

For initial set-up, the Silent Sentinel camera platform must be powered up, connected to the network and the viewing platform configured with an IP address in the correct subnet.

Silent Sentinel uses two variations of Encoder within the supplied cameras systems. Functionally, these are the same.

The usages of these encoders is as follows;

1. Oculus / Aeron
  - a. Typically a Dual Channel Encoder is used that offers two video feeds on the same IP Address;
    - i. Video Input 1: HD Daylight Feed
    - ii. Video Input 2: Thermal + SS OSD (Silent Sentinel On Screen Display)
      1. If there is no thermal present in the unit then this feed will just carry the SS OSD
2. Osiris / Jaeger Payloads
  - a. Daylight
    - i. This is typically a Single Channel Encoder offering a single Video Feed
  - b. Thermal
    - i. Depending on the Thermal this may be either a Single Channel Encoder (for thermals with a HDSDI Output) or a Dual Channel Encoder (for thermal with an Analogue output).
    - ii. If a Single Channel is used then the encoder will present 'Video Input 1'
    - iii. If a Dual Channel is used the encoder will present;
      1. Video Input 1 – this will be unused
      2. Video Input 2 – this will provide the Thermal + SS OSD.

Despite the variations in encoder type the information contained within this guide applies.

## Initial Network Configuration

1. Oculus / Aeron
  - a. IP Address: 192.168.1.100
  - b. Subnet Mask: 255.255.255.0
2. Osiris / Jaeger Payloads
  - a. Daylight
    - i. IP Address: 192.168.1.100
    - ii. Subnet Mask: 255.255.255.0
  - b. Thermal
    - i. IP Address: 192.168.1.101
    - ii. Subnet Mask: 255.255.255.0

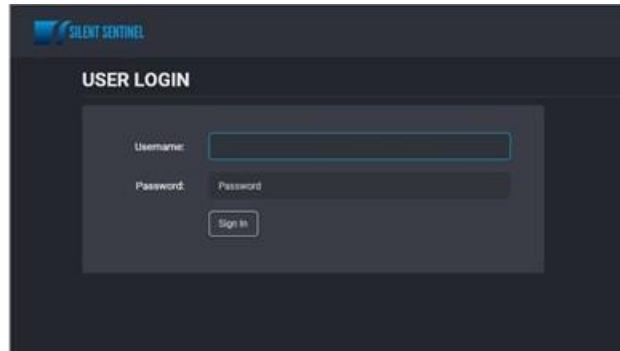
In order to connect to the encoders the host machine must have in IP Address configured in the above subnet.

## Web Interface

### Log In Page

When entering the web interface, you will be asked for a username and password. The default credentials are **'admin' / 'admin'**.

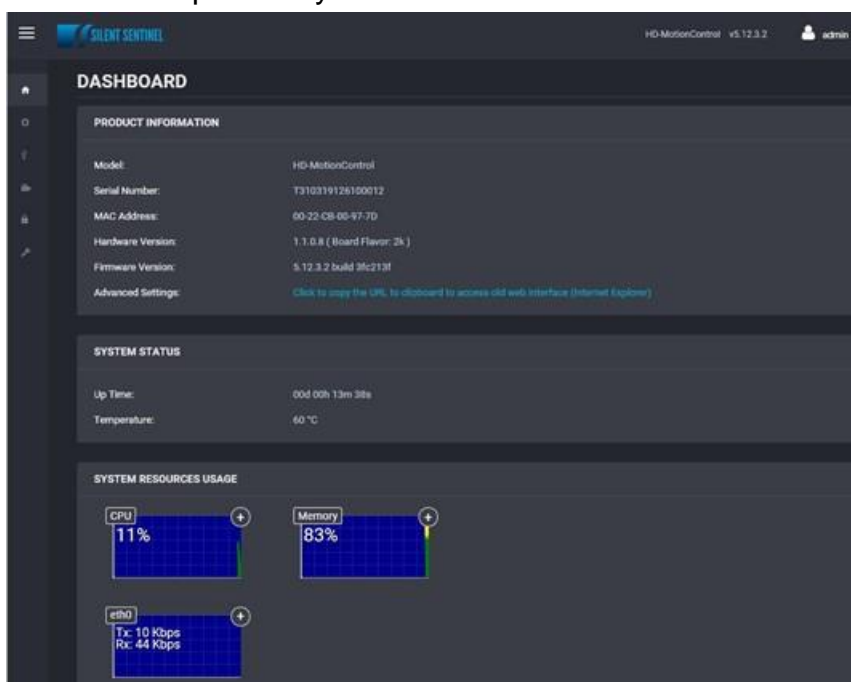
The following window will be displayed:



### System Status

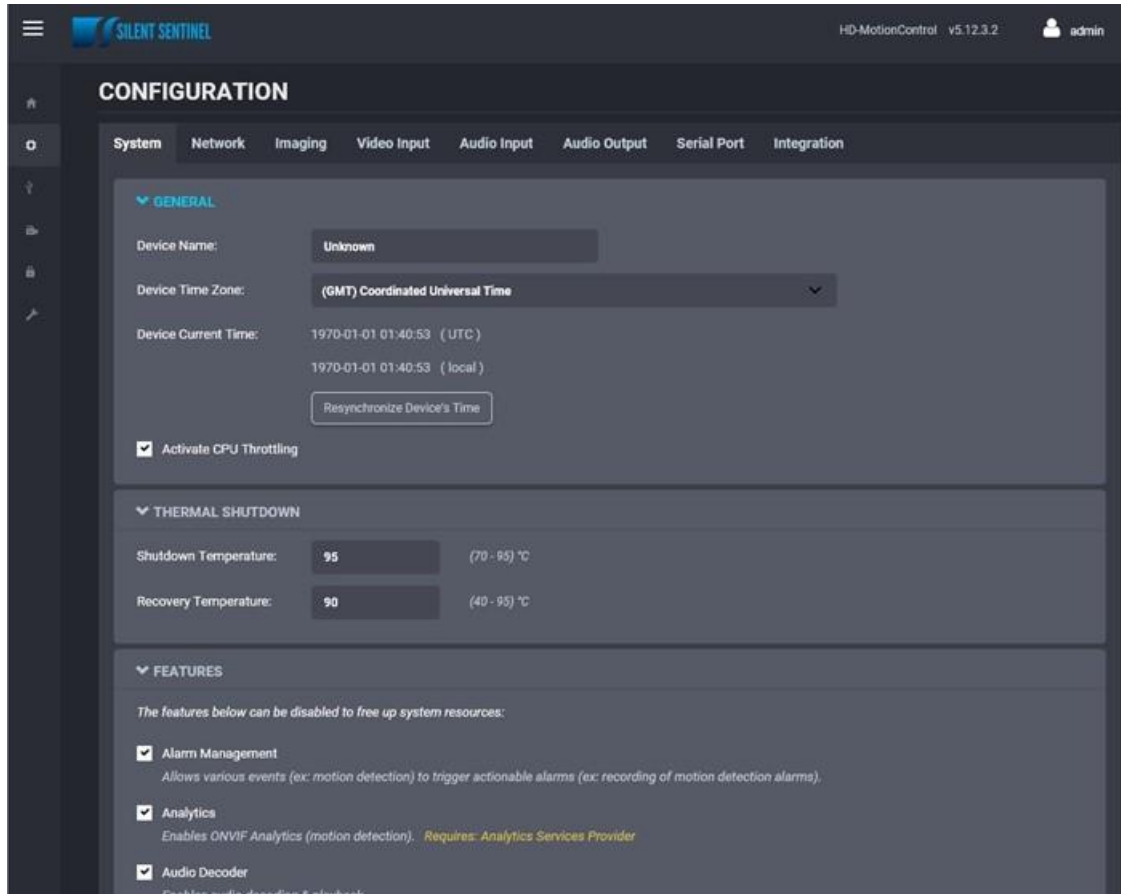
Upon successfully logging into the web interface, a **Dashboard** screen will be presented. This screen shows the device's product information, system status and system resources usage.

A link is provided for the older Silverlight-based web interface that is still needed for modifying some advanced settings. Once these features are migrated to the new HTML5-based interface, the older interface will not be required anymore.



# Configuration

## System



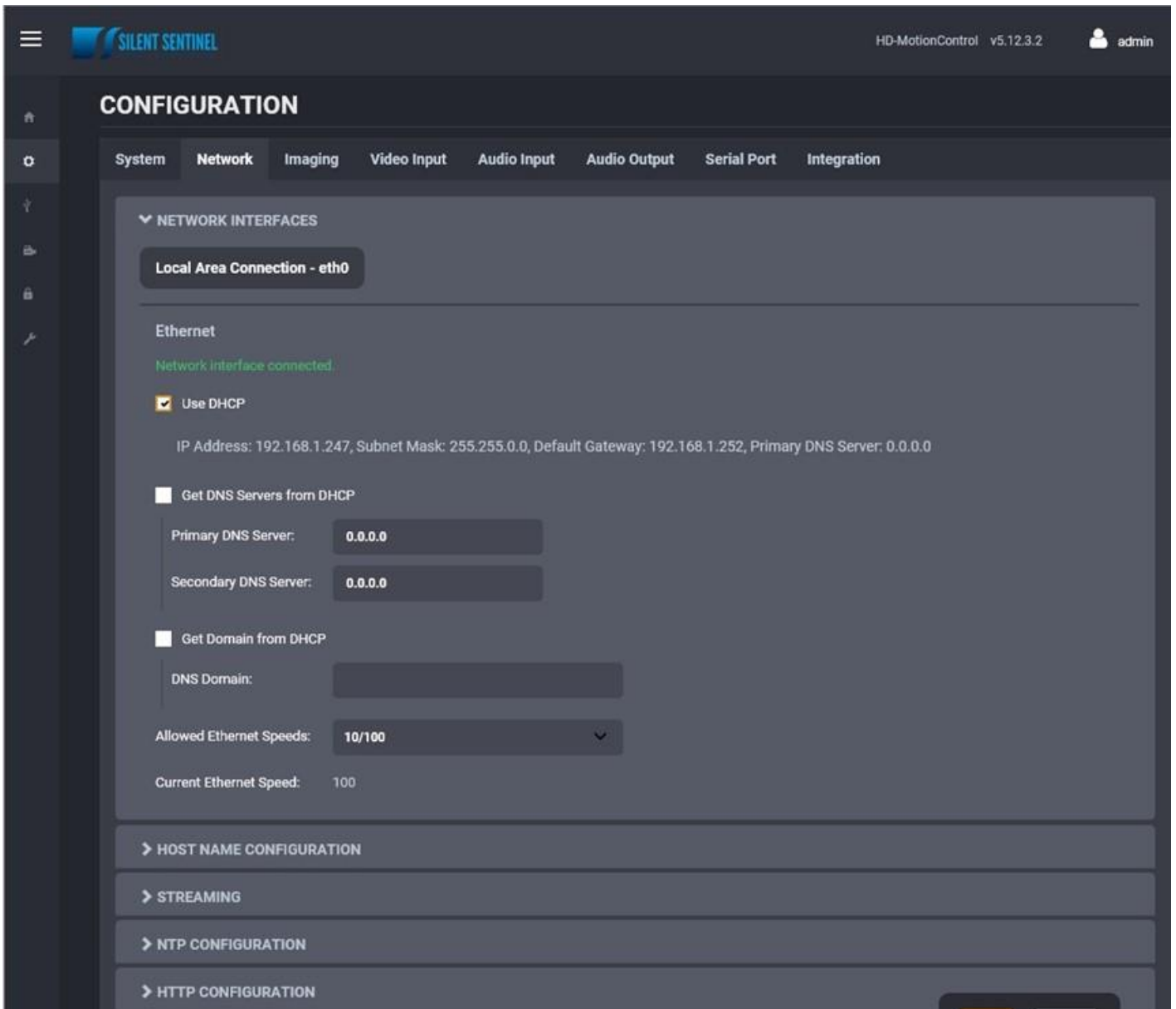
Under the **Configuration** section, select the **System** tab to perform the following operations:

- Specify a **Device Name**; this custom name can be used by third-party software to display a friendly name for the device
- Set the device's **Time Zone**; based on this setting, as well as the current UTC time, a local time is calculated and displayed. The button "Resynchronize Device's Time" will force a time synchronization between the encoder's internal clock and the local system that is used to open the web interface.
- **Activate CPU Throttling**; this feature aims to reserve a part of the CPU's processing resources for critical tasks, like handling PTZ commands. This is achieved by reducing the video quality during a short period when the CPU load is too high. After the CPU load decreases, the video quality is restored automatically.

- Set **Thermal Shutdown** thresholds; these are used for controlling the behaviour of the platform when very high operating temperature conditions are encountered (which can otherwise affect the platform's reliable operation). The encoder will enter RESET mode when the shutdown temperature is reached and remain in this state until the temperature drops below the recovery temperature.
- **System Features**; a list of the features supported by the system, along with their dependencies (if applicable), is presented to the user. Based on the application/project where the encoder is being used, some features considered irrelevant may be disabled. For each feature, a brief description is provided.



## Network

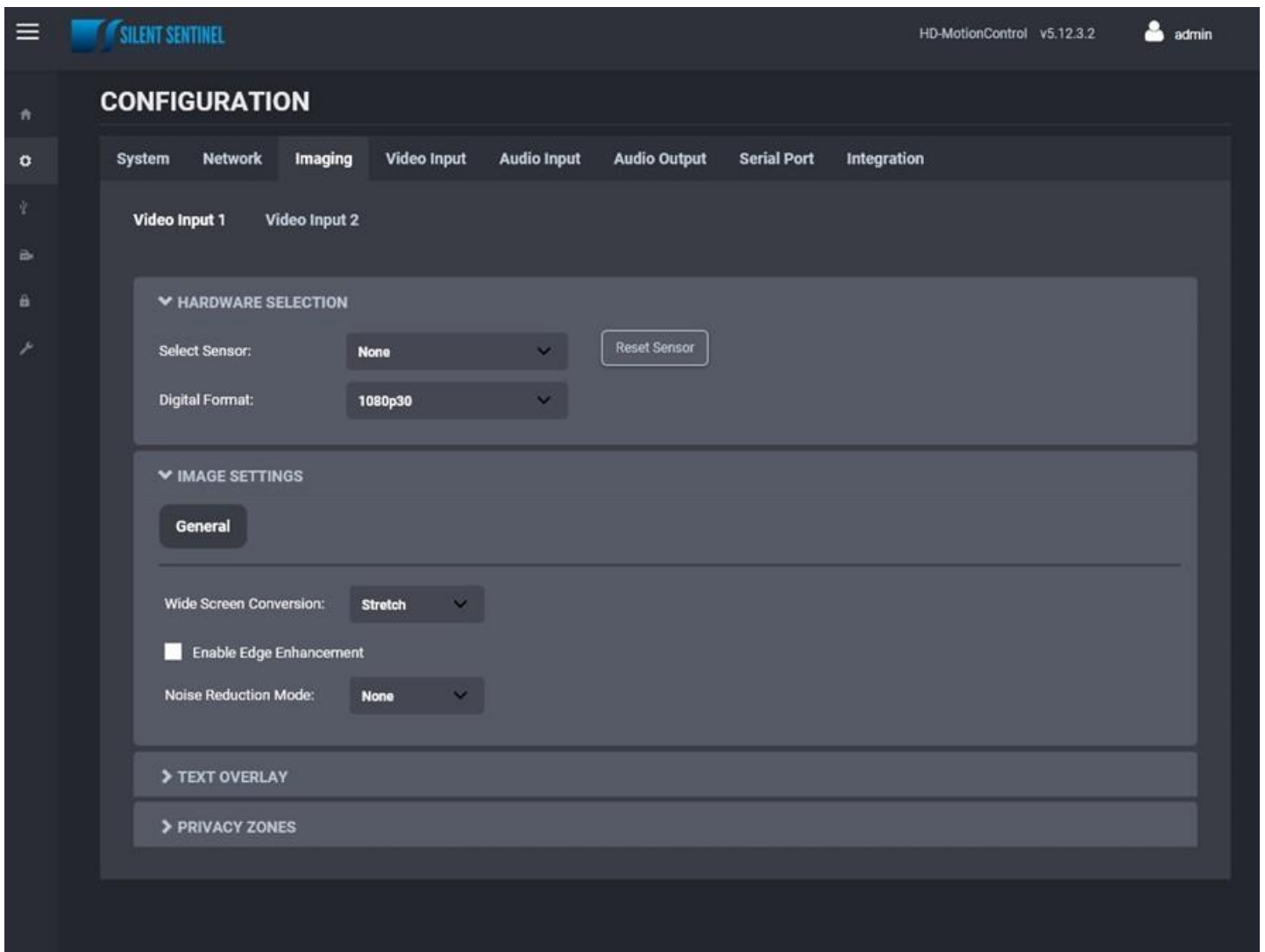


Under the **Configuration** section, select the **Network** tab to perform the following operations:

- **Network Interface** – Set the encoder's IP parameters; DHCP or static IP information. The user can also choose the allowed Ethernet Speed in order to increase compatibility with 3<sup>rd</sup> party networking equipment that the encoder is directly connected to.
- **Host Name Configuration** – Set the encoder's network name.
- **Streaming** – Set the MTU size for all media related RTP packets sent on the network; avoid changing this setting unless absolutely necessary.
- **NTP Configuration** – Configure an NTP server to allow the device to automatically update its internal clock using an NTP server.

- **HTTP Configuration** – Change the device’s HTTP configuration
  - **HTTP Port** – TCP port used by the HTTP server
  - **HTTPS Port** – TCP port used for SSL connections on the HTTP server
  - **Authentication mode** – Basic or Digest Authentication for HTTP connections
  - **Accept HTTPS connections** – Enables support of SSL connections
  - **Accept HTTPS only** – Forces the HTTP server to accept only SSL connections
- **Bonjour** – Enable Bonjour discovery protocol and configure search domain.
- **RTSP Configuration** – Change the device’s RTSP configuration
  - **RTSP Server Port** – TCP port used by the RTSP server.
  - **Session Timeout** – Configure timeout in seconds for RTSP session. The RTSP client will need to send a keep-alive before the timer for the session runs out. As a best practice please configure your RTSP client to send the keep-alive at around half of the session timeout. If the keep-alive is sent very late and the network performance is degraded (packets are being buffered and arriving late) the keep-alive might not make it in due time to the RTSP server and the session will be closed.
  - **Authentication mode** – Basic or Digest Authentication for RTSP connections.
- **SNMP** – Modify SNMP settings to match with any SNMP software you wish to use for monitoring the device.
- **Multicast** – Change the starting multicast IP address, starting port and TTL for all outgoing multicast streams. By default, each outgoing multicast stream will be automatically assigned a multicast IP address and port based on the configured range. To disable multicast streaming, set the multicast start port to 65535.
- **Mail Server Configuration** – Change email server settings to use for email alerts and events. The mail frequency parameters allows you to limit the number of emails which can be sent out per minute. The number of retry parameter allows you to set a limit to the number of retries before an email transmission is aborted.
- **Miscellaneous ports** - Enable or disable various system ports used for auxiliary functionality (like system logs for instance)

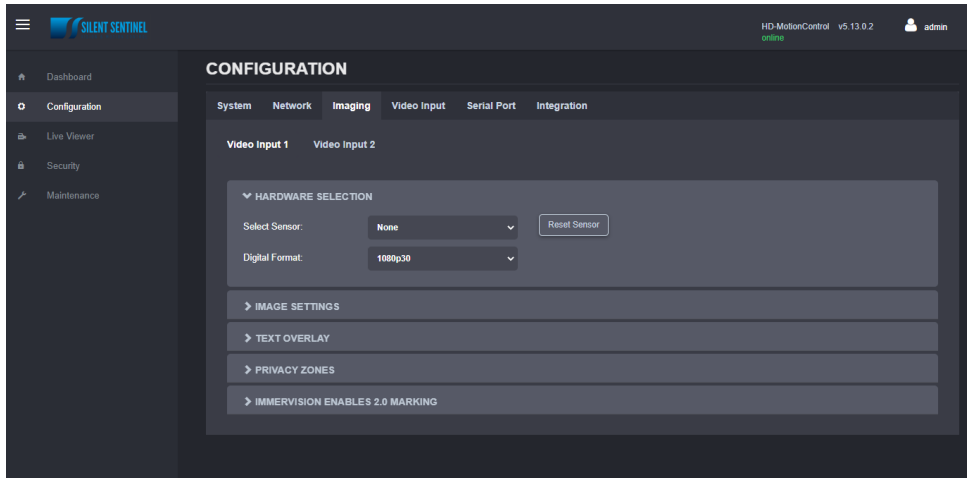
# Imaging



Under the **Configuration** section, select the **Imaging** tab to perform the following operations:

- **Hardware selection** –
  - **Select Sensor** – **NOTE: DO NOT CHANGE THIS SETTING.**
  - **Digital Format** – **NOTE: DO NOT CHANGE THIS SETTING.**
  - **Reset Sensor** – **NOTE: DO NOT CHANGE THIS SETTING.**
  
- **Digital Sensor Settings** –
  - **IMAGE STABILIZATION** – **NOTE: THIS IS NON FUNCTIONAL.**
  - **NOISE REDUCITON** – **NOTE: THIS IS NON FUNCTIONAL.**
  -
- **Image Settings** – **NOTE: DO NOT CHANGE THIS SETTING.**
  
- **Text Overlay** – This section allows you to add text overlays to encoded video streams. Note that these strings will be embedded into the images streamed out of the device. The position, as well as text size, can be customized according to the user’s preferences.

Within the same OSD, two independent texts can be configured. You can have for instance the camera name plus the time/date.



Please check “*Custom Text Formats*” for details on the available automatic (dynamic) text options.

**CUSTOM TEXT FORMATS**

<b>%d</b>	Display the date/time (local time) in the format yyyy-mm-dd HH:mm:ss.
<b>%dz</b>	Display the date/time (UTC time) in the format yyyy-mm-dd HH:mm:ss.
<b>%t</b>	Display the time (local time) in the format HH:mm:ss.
<b>%tz</b>	Display the time (UTC time) in the format HH:mm:ss.
<b>%h</b>	Display the camera heading (short). Ex: N, W, SE, NW.
<b>%H</b>	Display the camera heading (long). Ex: NORTH, WEST, SOUTH EAST.
<b>%ht1 - %ht9</b>	Display the camera heading (short) for 1 to 9 seconds when the camera moves.
<b>%Ht1 - %Ht9</b>	Display the camera heading (long) for 1 to 9 seconds when the camera moves.
<b>%p</b>	Display the current azimuth & elevation. Ex: AZ 280.72 EL 12.98.
<b>%pt1 - %pt9</b>	Display the camera azimuth & elevation for 1 to 9 seconds when the camera moves.
<b>%c[format]</b>	Display the date/time (local) in the custom format specified. See format definition below.
<b>%cz[format]</b>	Display the date/time (UTC) in the custom format specified. See format definition below.

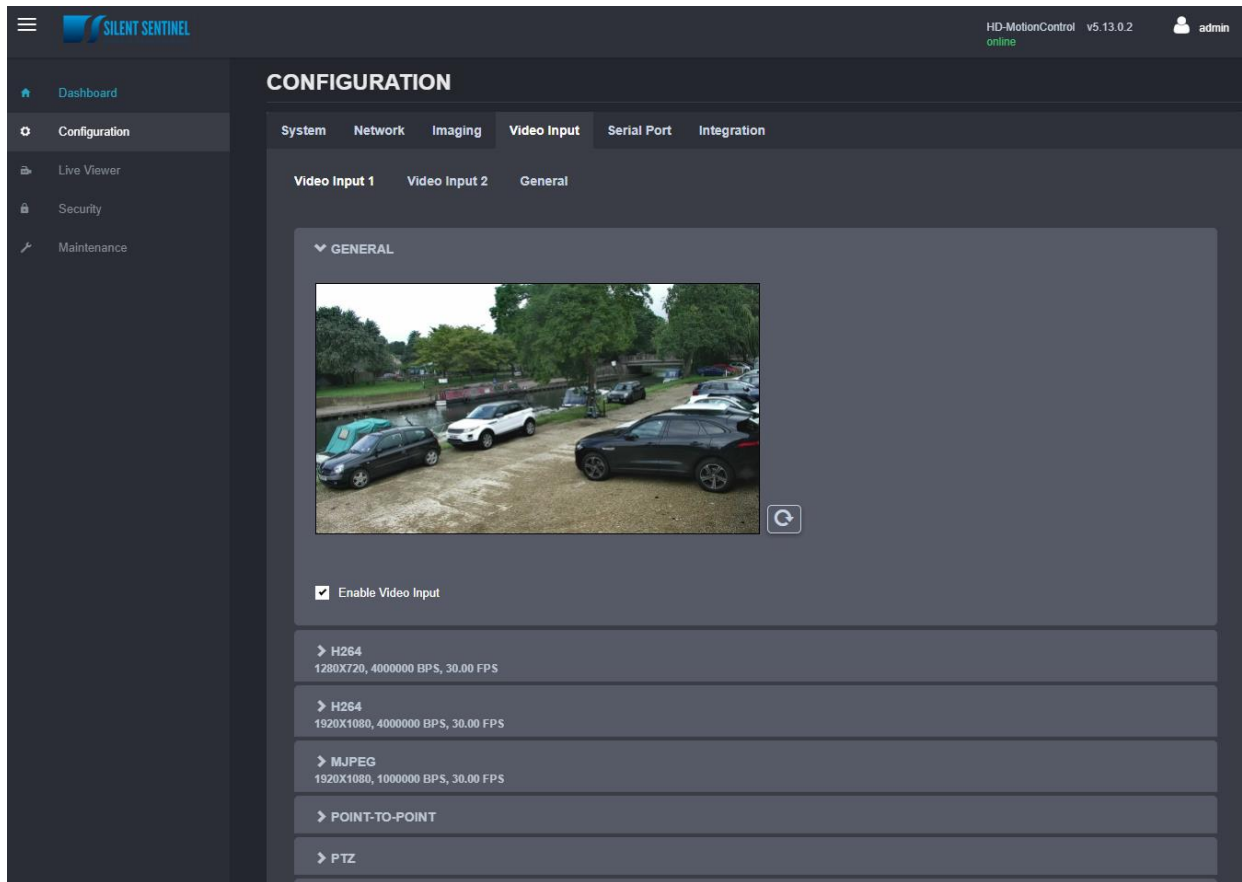
<b>%Y</b> Year (0000-9999)	<b>%a</b> Weekday, abbreviated
<b>%y</b> Year (00-99)	<b>%H</b> Hour (00-23)
<b>%m</b> Month (01-12)	<b>%I</b> Hour (01-12)
<b>%B</b> Month name	<b>%M</b> Minute (00-59)
<b>%b</b> Month name, abbreviated	<b>%S</b> Second (00-59)
<b>%d</b> Day of month (01-31)	<b>%p</b> AM/PM designation
<b>%A</b> Weekday	

Ex: %cz[%B %d, %H:%M] could yield « September 20, 13:19 ».

Close

- **Privacy Zones – NOTE: THIS IS NON FUNCTIONAL.**

## Video Input



Under the **Configuration** section, select the **Video Input** tab to perform the following operations:

### General

- **General** – This section allows you to enable/disable the currently selected video input.
  - **NOTE: DO NOT CHANGE THIS SETTING**

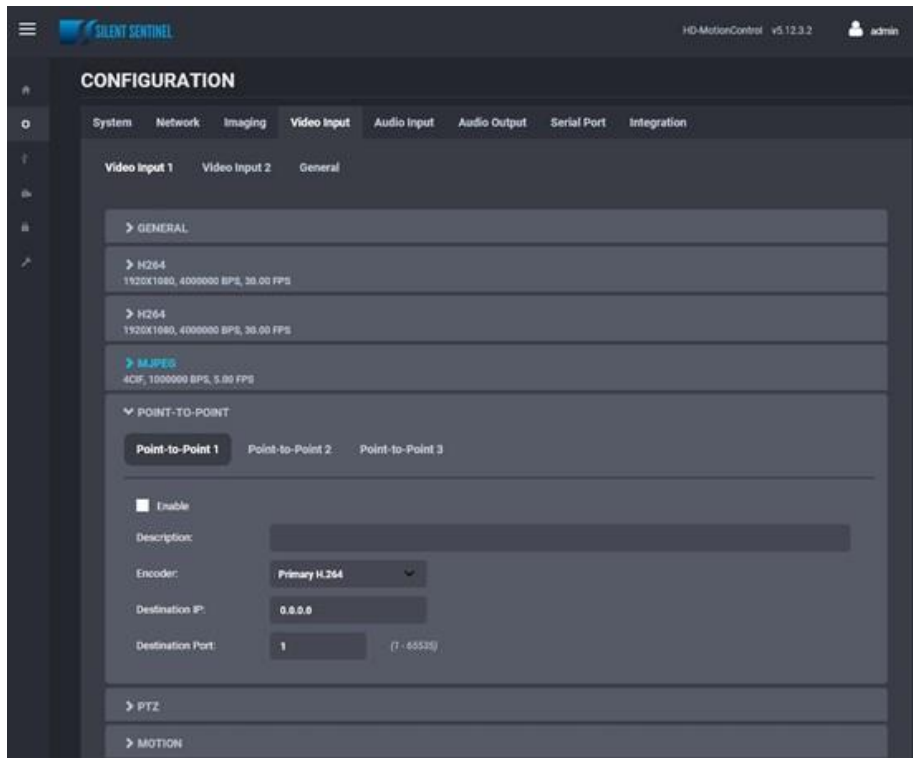
### Video Compression

- **Video Compression** – This section allows you to configure video compression parameters for any of the three available codec instances (Primary, Secondary and MJPEG).
  - **Enable Encoder** – Allows you to enable the encoder to be utilized
  - **Custom Name** - Allows you to define a custom name for that specific encoder
  - **Encoder type** - Allows you to choose your codec (H.264 is the only codec supported right now)
  - **Profile** – Select the H.264 profile you wish to use
  - **Resolution** – Select the video resolution to stream
  - **Frame skip rate** – Select the number of video frames to be skipped from the input in order to create an output stream with a certain frame rate (resulting frame rate is always shown, based on the selected skip rate)

- **Target bit rate** – Select the desired target bitrate
- **Rate control** – Select between Constant Rate or Variable Rate
- **Minimum QP / Maximum QP** – These parameters allow you to specify the compression range that the codec will use to determine image quality during compression. In order to force a specific quality setting, you can set the minimum and maximum to the same value. The lower the value, the better the quality will be. We do not recommend changing default values unless you have a good understanding of the H.264 compression process.
- **Intra interval** – Defines the GOP size
- **VBR aggressiveness** is unique to IONODES encoders and proposes various levels (disabled to aggressive) of motion triggered rate control. The more aggressive the setting, the more variation motion will have on the rate control. It is strongly suggested to disable VBR aggressiveness for low bit rate scenarios (below 1Mbps) as this parameter may negatively affect perceived video quality
- **Multicast Assignment** – This allows you to manually configure the Multicast IP & Port for the outgoing stream; when the automatic setting is enabled the encoder will automatically assign the Multicast IP & Port based on the range defined in the Network > Multicast section of the web interface

## Point-to-point

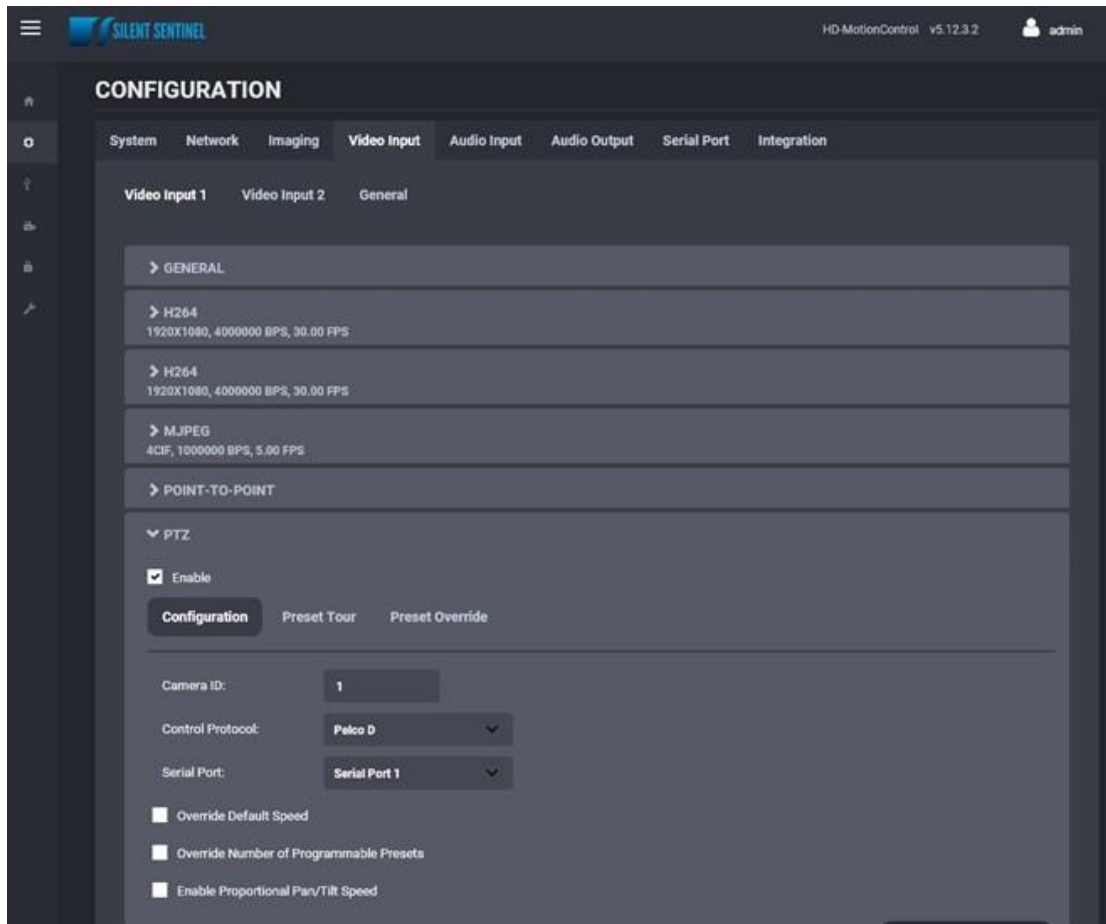
- **Point to Point** – This section allows you to configure point to point video connections for creating persistent video streams from the encoder to a network endpoint. A maximum of 3 point-to-point connections can be defined & enabled.



- **Enable:** Indicates whether this connection is to be used or not.
- **Description:** Free-form user description of the connection, not used by the device.
- **Encoder:** Indicates which video feed is to be sent over the point-to-point connection. The values refer to the encoders configured in previous sections of the web interface.
- **Destination IP:** Address where to send the video stream. Please note that the destination can be a multicast group address.
- **Destination Port:** Network port where to send the video stream.

Once all the settings have been set, click on **Save** at the bottom of the page in order to apply them. The ENCODER then creates or updates the connection as needed.

## PTZ



- **PTZ** – This section allows you to configure PTZ control behaviour.
  - **Enable** – Allows you to enable PTZ support on this encoder module.
  - **Camera ID** – Logical ID associated to the PTZ controller connected to this encoder module.
    - **NOTE: THERMAL: Camera ID 2**
  - **Control Protocol** – PTZ protocol used for communicating with the PTZ controller.
    - **NOTE: Default for both Daylight and Thermal is Pelco D**
  - **Serial Port** – Serial port instance on which the PTZ controller is connected.
    - **NOTE: Default is Serial Port 1**
  - **Override Default Speed** – Allows you to set a different default speed for PTZ movements.
    - **NOTE: This may clash with Pan / Tilt settings for Zoom-Dependant-Speed. It is advised not to change this setting.**
  - **Override Number of Programmable Presets** – Allows you to set the number of PTZ presets that can be programmed via the encoder module.
    - **NOTE: DO NOT CHANGE**
  - **Enable Proportional Pan/Tilt Speed** – Allows the encoder to automatically modify the Pan/Tilt Speed based on the current Zoom position (the further you Zoom In the lower the Pan/Tilt Speed)
    - **NOTE: This may clash with Pan / Tilt settings for Zoom-Dependant-Speed. It is advised not to change this setting.**



- **Preset Tour** – This sub-section allows you to configure up to 8 preset tours. These tours are managed by the encoder module.

To configure a PTZ preset tour, add or remove presets as needed. The tour starts at the top of the preset list and moves to the next preset in the list after the specified time. Once the tour has reached the end of the preset list, it moves back to the top of the list. If the preset list is empty, the tour simply stops without moving the camera.

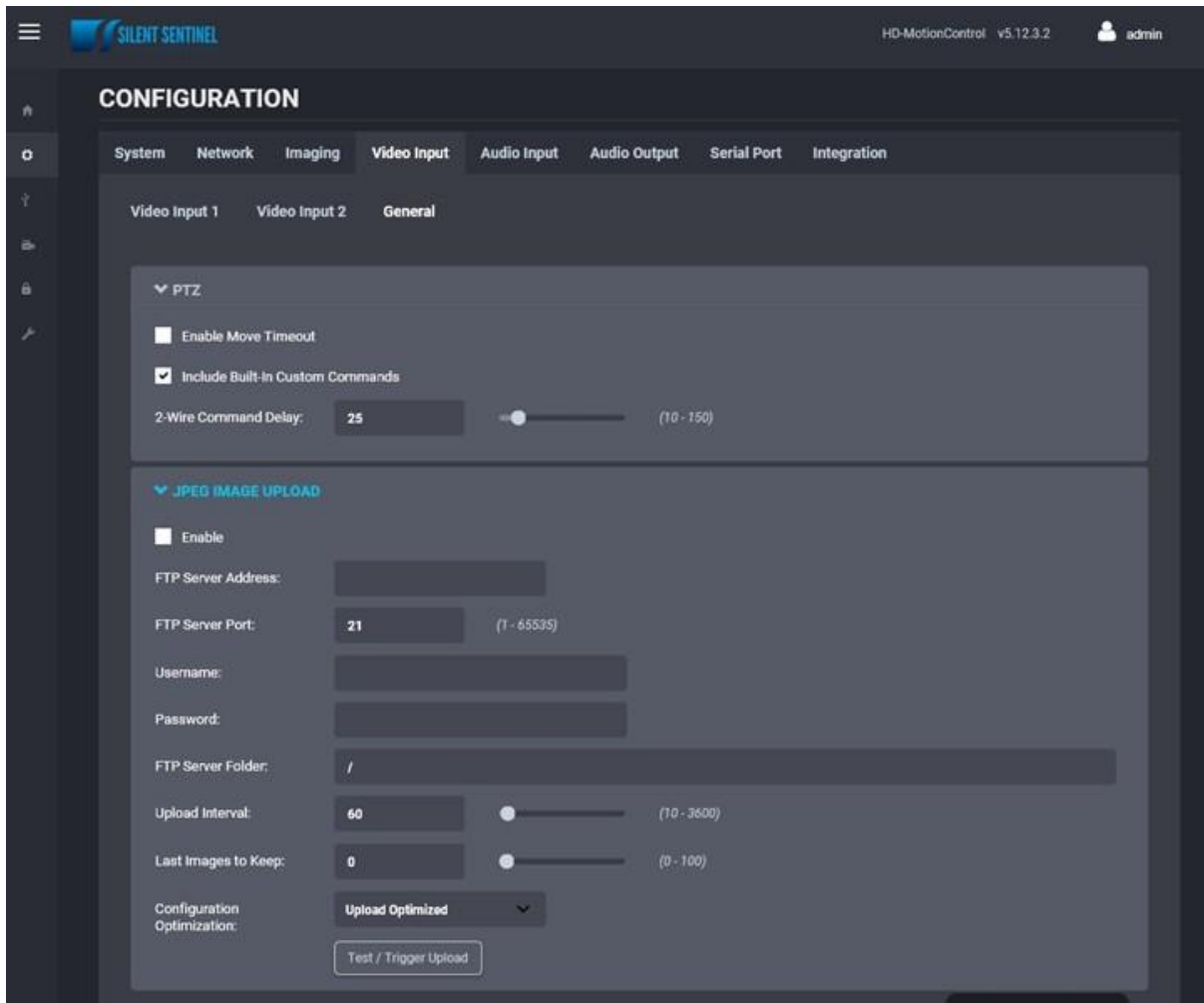
A preset tour supports up to 32 presets.

To configure a preset in the tour, select the preset in the preset list by clicking on it. The preset number and duration can then be changed. Preset numbers range from 0 to 31 and durations from 1 to 60 seconds. You can also reorder of the preset list by selecting a preset in the list and by clicking the UP or DOWN button on the right side of the preset list to move it up or down.

The changes are applied to the tour when you click on the **Save** button at the bottom of the web page.

- **Override Presets** – Allows you to override a specific PTZ preset. Following the selected protocol, a fixed set of presets can be configured. But, depending of the PTZ controller, more presets may be available. To be able to call a preset over the official protocol preset range, a preset can be overridden to call an extended preset id.

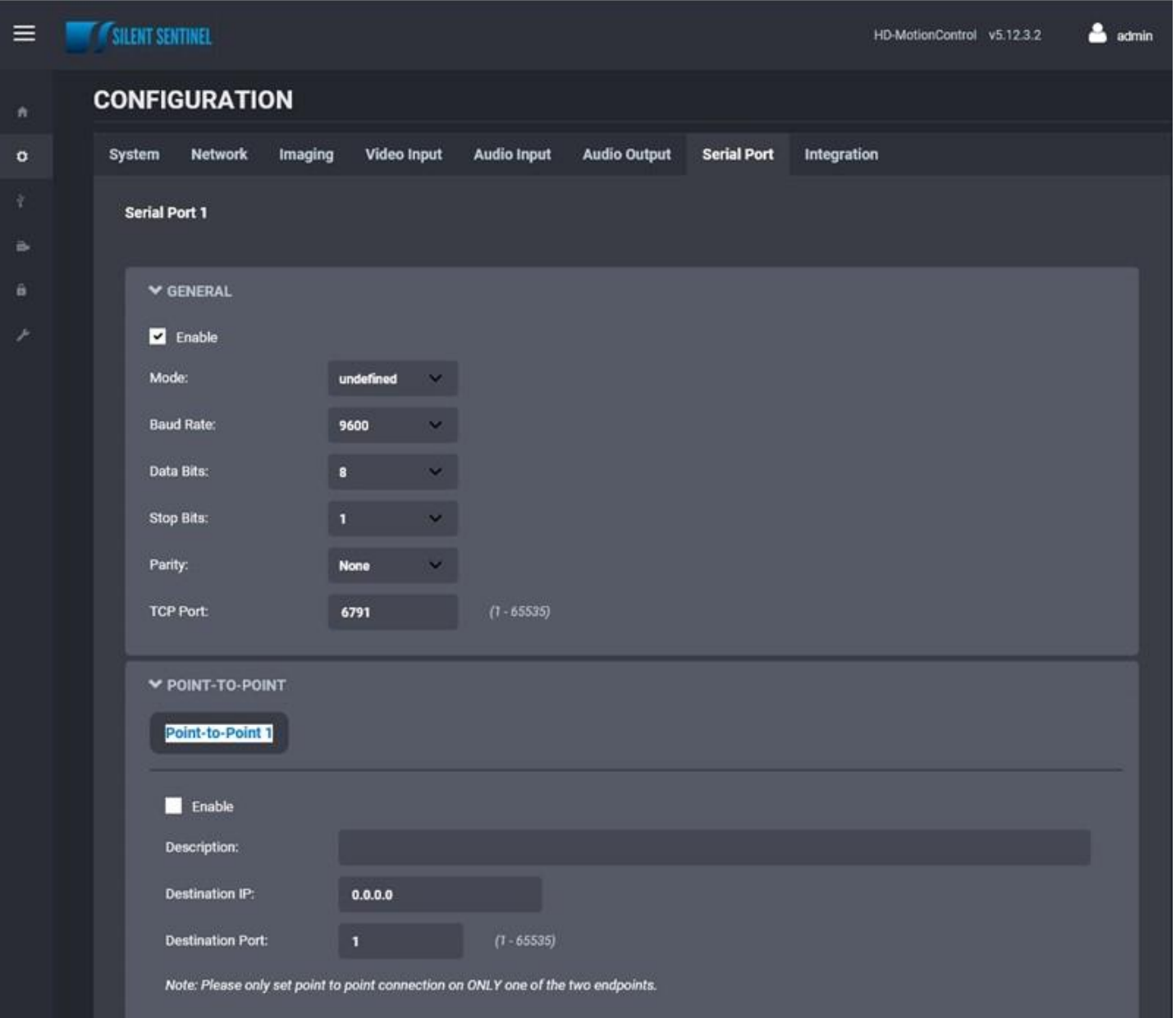
## General



Under the **Configuration** section, select the **Video Input > General** tab to perform the following operations:

- **PTZ** – This sub-section allows you to configure general parameters related to PTZ functionality
  - **Enable Move Timeout** – sets the timeout for stopping a move PTZ command
  - **Include Built-In Custom Commands** – allows the encoder's PTZ module to use built-in Custom Commands
  - **2-Wire Command Delay** – sets the command delay for cases where the serial connection to the PTZ controller is working in 2-wire mode
- **JPEG Image Upload** – This section allows you to configure JPEG Upload functionality.

## Serial Port



The screenshot shows the 'CONFIGURATION' section of the Silent Sentinel web interface. The 'Serial Port' tab is selected, displaying settings for 'Serial Port 1'. The interface is divided into two main sections: 'GENERAL' and 'POINT-TO-POINT'.

**GENERAL**

- Enable
- Mode: undefined
- Baud Rate: 9600
- Data Bits: 8
- Stop Bits: 1
- Parity: None
- TCP Port: 6791 (1 - 65535)

**POINT-TO-POINT**

**Point-to-Point 1**

- Enable
- Description: [Empty text field]
- Destination IP: 0.0.0.0
- Destination Port: 1 (1 - 65535)

*Note: Please only set point to point connection on ONLY one of the two endpoints.*

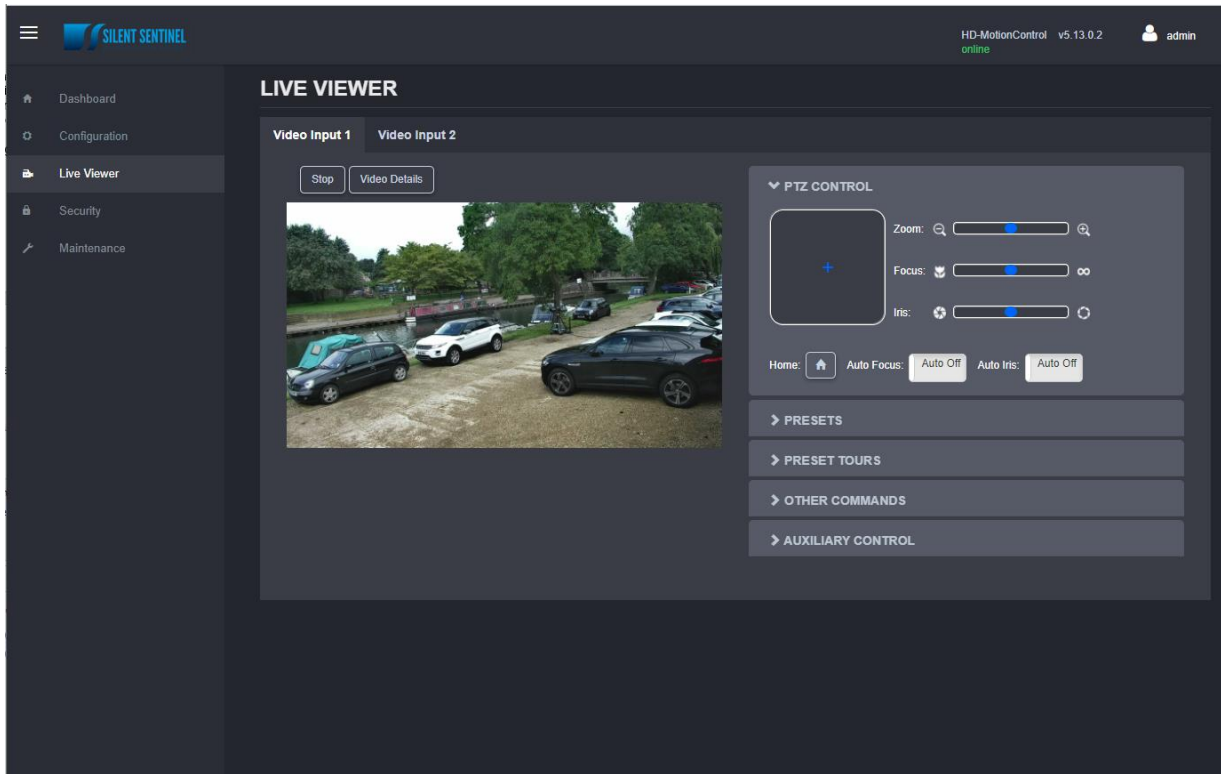
Under the **Configuration** section, select the **Serial Port** tab to perform one of the following operations:

- **Serial Port 1** – These settings relate to the Serial Link that the encoder uses to transmit PTZ Commands to the Pan / Tilt Unit. The default settings are detailed below. Do not change these unless they have also been changed on the Pan / Tilt unit.
  - **Mode:** RS485
  - **Baud Rate:** 9600
  - **Data Bits:** 9
  - **Stop Bits:** 1
  - **Parity:** None
  - **TCP Port:** 6791

- **Serial Port 1 Point to Point** – This section allows you to configure a point to point serial port connection for creating a persistent serial port connection with a network endpoint.

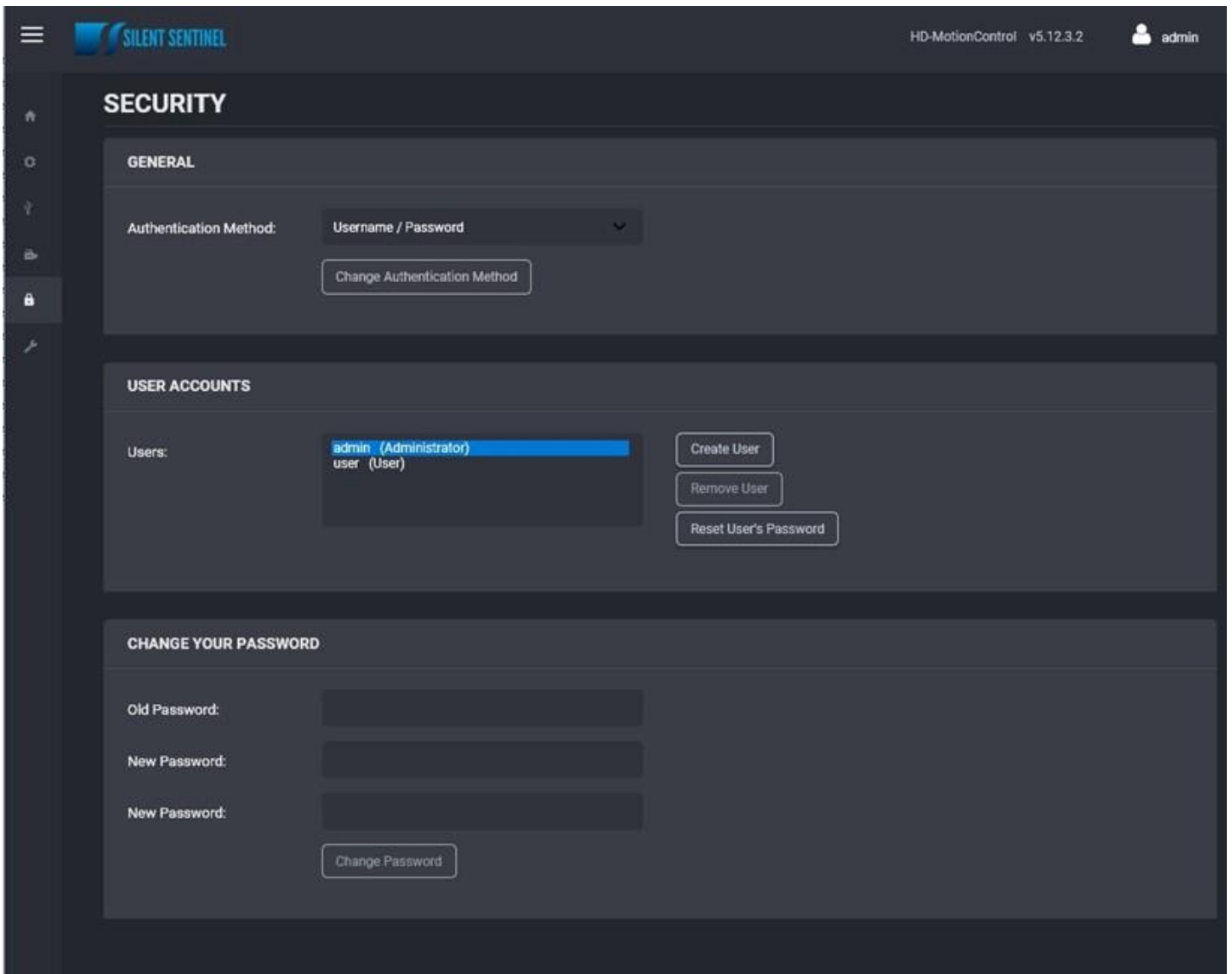
## Live Viewer

The Live Viewer page allows you to display an MJPEG video stream preview of the captured scene (MJPEG codec needs to be enabled), as well as have access to the PTZ control (including PTZ tours). This is intended to be used for the initial configuration of the final camera system.



From here the PTZ of the Camera can be controlled alongside presets etc. The SS OSD can typically be accessed by Selecting Video Input 2 and sending 'Preset 1'.

## Security



The **Security** section allows you to perform the following operations:

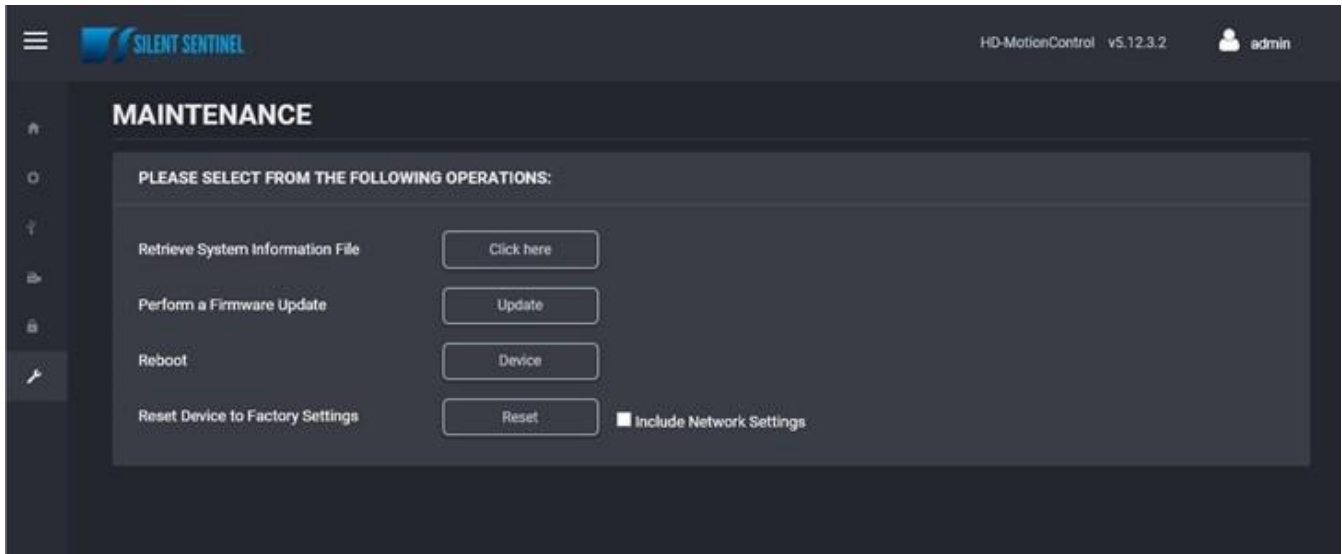
- Select the web interface's authentication method.
- Manage user accounts which have access to the device.

The user account roles are defined as follows:

- The **User** role allows access to viewing only, no permission to change any settings
- The **Poweruser** role allows access to live video and changing any setting aside from the user accounts list. This role does not grant access to recorded video clips.
- The **Superuser** role allows access to live and recorded clip viewing and changing any setting aside from the user accounts list.
- The **Administrator** role allows access to viewing and changing any setting in the system.

## Maintenance

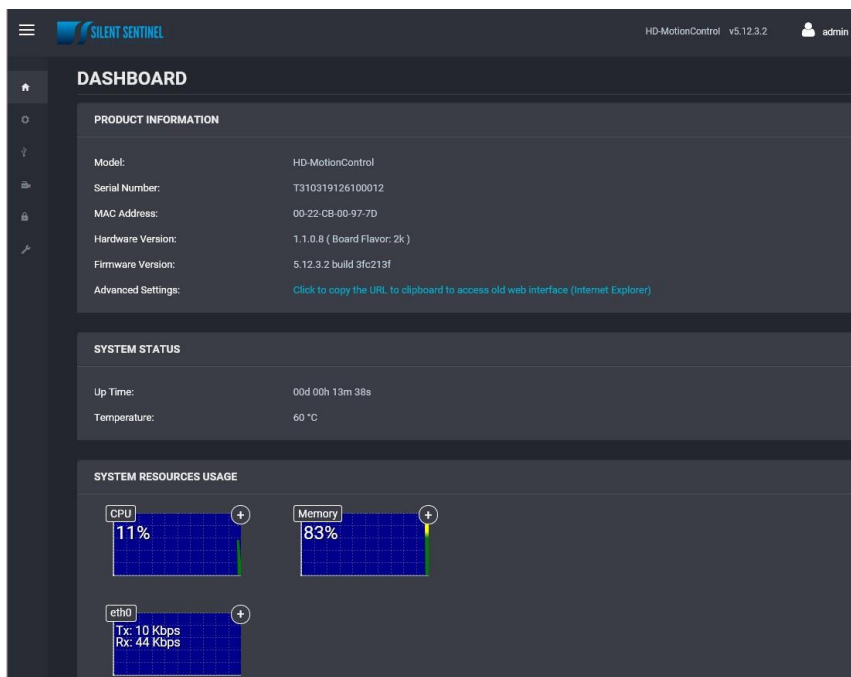
The Maintenance page allows you to retrieve the system information (“SysInfo”) file, perform a firmware update, reboot the unit and perform a factory reset (with or without including the network settings).



## Performing a Firmware Update

### Identify correct Firmware

In order to update the FW you must first find out which Hardware Flavour is current running. You can do this by entering the ‘Dashboard’ section and looking up the flavour under the ‘Hardware Version:’ dialog. The Flavour will either be 2K or 4K.



SSSSSS

## Updating the Firmware

This section describes how to update your ENCODER to newer firmware versions from the web application.

1. Navigate to your device's web application using your favorite web browser.
2. Click on the **Maintenance** tab.
3. Click on the **Update** button. You will be asked for the firmware update file; please select the **.iof** file which was provided by IONODES.
4. You will see the following messages indicating the status of the update:
  - Firmware upload in progress... (100%)
    - Lasts around 95 seconds.
  - Firmware uploaded. Saving to internal storage... (0%)
    - Lasts around 45 seconds.
  - Validating and decompressing firmware... (0%)
    - Lasts around 105 seconds.
  - Firmware ready for installation. Rebooting device... (0%)
    - Web page will disconnect from device until device has rebooted.
    - You will be prompted for login once the device is up again.
    - Lasts around 110 seconds.
  - Testing firmware stability... (26%)
    - Lasts 120 seconds.
  - Firmware update complete. (100%)