IONODES

ION-E100
User Manual

Version 1.7

IONODES

The **smart** appliance of media.

IONODES

Table of Contents

1 Before you begin

1.1 About the ION-E100

The ION-E100 single port encoder delivers high quality H.264 video encoding to the video surveillance market. It is an embedded, high-performance digital video encoder, capable of encoding an analog camera input using multiple profiles at a combined 90 images per second (NTSC/PAL) at 4CIF resolution.

Embedding support for networked API's, the ION-E100 can be integrated into a networked video management system allowing for centralized monitoring and management in a scalable and expandable IP surveillance system. Contact IONODES for a list of supported VMS systems.

The high-performance encoding capability of the ION-E100 offers a cost-effective way to service existing analog cameras while providing the benefits of video over IP networks.

The ION-E100 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 encoding, while keeping the total cost of ownership within budget constraints, the ION-E100 uses highly efficient dual stream H.264 compression and supports an optional third MJPEG stream.

Advanced features, such as "edge-recording" and "video analytics" allow you to extend usage of the ION-E100 well into the future.

1.2   Parts List

Qty   Description

1   ION-E100 appliance

1   Terminal block socket (P/N Weidmuller 1727660000 or 1727580000)

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-E100 or its components require service. The label is attached on the underside of the enclosure.

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2 Hardware Installation

2.1 Equipment Installation

The ION-E100 can be placed on a flat surface, such as a desktop, or mounted via the available mounting holes.

When installing the ION-E100, 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-E100 can be mounted to various mounting structures via the available mounting holes. Note that mounting screws are not shipped with the device.

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

3 Connections

Familiarize yourself with the ION-E100 front and rear panels before connecting any equipment to the unit. The ION-E100 offers a single analog video input and associated I/Os and audio connections.
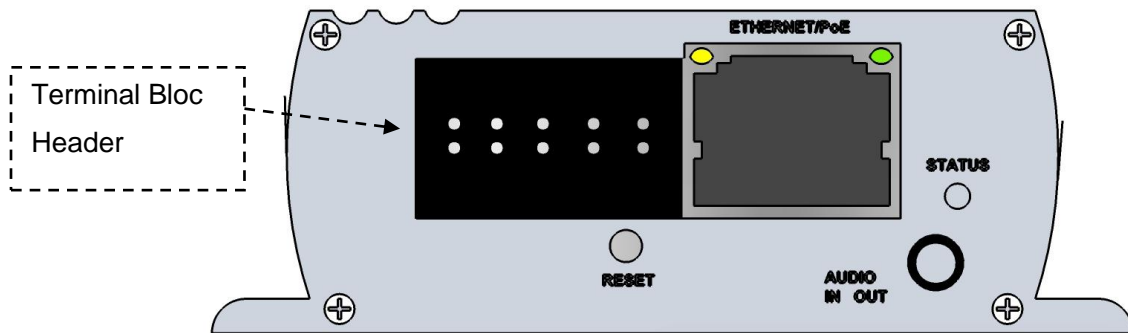
3.1 Front Panel
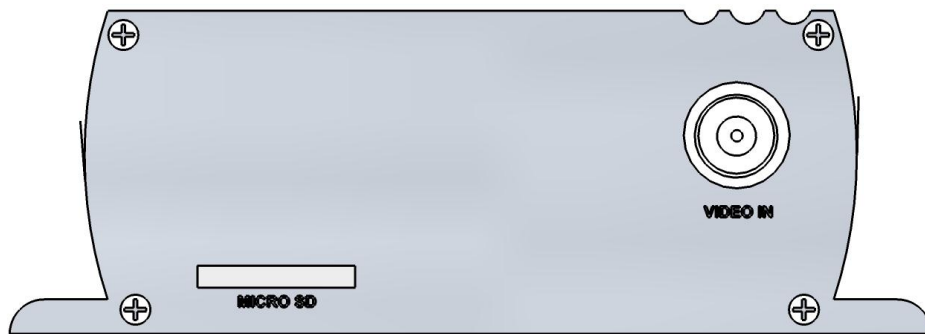
- **VIDEO IN**

  BNC connector interface for video input source (NTSC / PAL).

- **MICRO SD (optional)**

  Micro SD connector available for edge recording capability. Please insert a formatted (FAT) micro SD card to enable associated functionality.

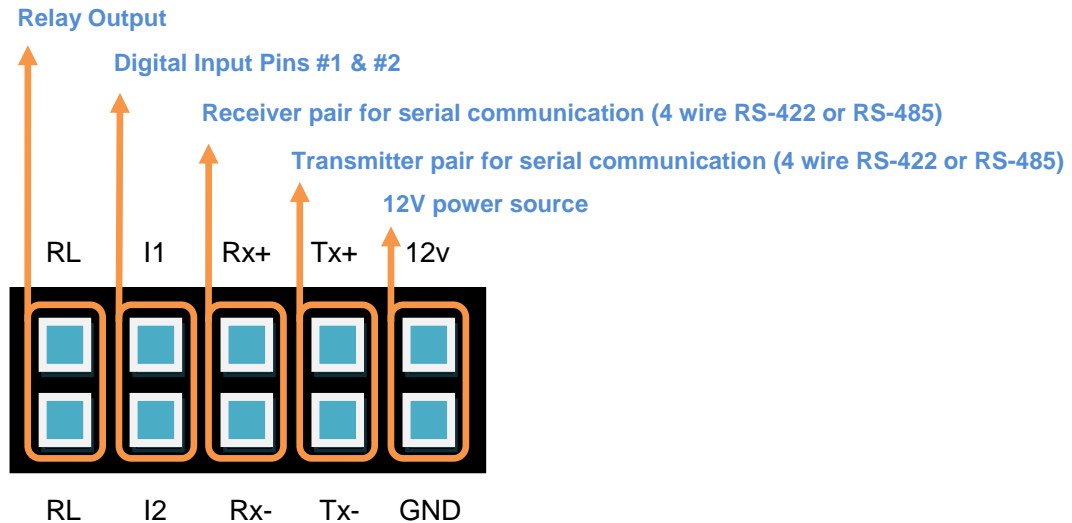**Note:** A micro SD card is not provided with the device.

3.2 Rear Panel

- **Terminal Bloc Header**

   This header connector is used to connect the supplied *Terminal Bloc Socket* which provides the interface to serial port, I/O and power connections.

   Below is a detailed view of this *Terminal Bloc Socket*:

Relay Output

**Digital Input Pins #1 & #2**

Receiver pair for serial communication (4 wire RS-422 or RS-485)

Transmitter pair for serial communication (4 wire RS-422 or RS-485)

12V power source

RL   I1   Rx+   Tx+   12v

RL   I2   Rx-   Tx-   GND

The pin out description of the *Terminal Bloc Socket* is as follows:

Number	Description	Direction
1	RL (Relay)	Out
2	RL (Relay)	Out
3	I1 (Digital Input 1)	In
4	I2 (Digital Input 2)	In
5	RX+	In
6	RX-	In
7	TX+	Out
8	TX-	Out
9	12V supply	In
10	Ground	-

- **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.
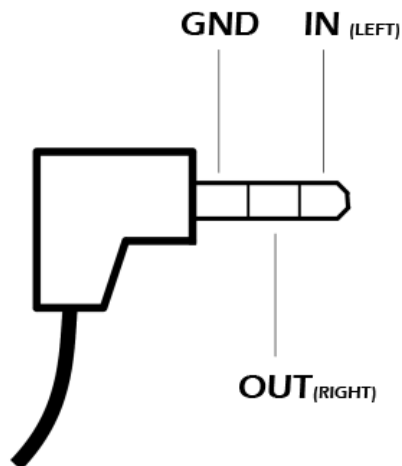
- **STATUS**

  The system status LED is a bi-color (Yellow - Orange) LED providing detailed

information on the current state of the device.

- **ETHERNET / PoE**

  This is the ION-E100 network port. Please use a straight RJ45 (cat. 5 or 6) network cable. The ION-E100 accepts a Power-Over-Ethernet (PoE) compliant power source if needed.

- **RESET**

  The reset button can be used to perform a hardware reset, or to perform a complete reset to default settings of the device's configuration parameters.

4 Serial Port Connectivity

Many devices (PTZ keyboards, PTZ cameras, etc.) use RS-422/485 protocols for communicating with other equipment. These protocols are standards for binary data exchange between DTE and DCE equipments.

To connect serial equipment to an ION-E100 using RS-422/485 4-wire configuration, use the following steps:

1. Connect twisted pair cables to the *Terminal Bloc Socket* located on the front panel of the device. Connect to **Tx+**, **Tx-**, **Rx+**, **Rx-** and **GND**.

2. Select the desired operation mode (RS-422 4-wire, RS-485 2-wire or RS-485 4-wire) using the devices web interface or external VMS interface.

3. To ensure proper connection between RS-422 4-wire or RS-485 4-wire serial equipment and the ION-E100, use the following scheme:

Equipment Serial Port	ION-E100 Serial Port
TX+	RX+
TX-	RX-
RX+	TX+
RX-	TX-
GND	GND

To connect serial equipment to an ION-E100 using RS-485 2-wire configuration, use the following steps:

1. To create the negative data signal, please connect **Rx-** and **Tx-** pins together on the *Terminal Bloc Socket*.

2. To create the positive data signal, please connect **Rx+** and **Tx+** pins together on the *Terminal Bloc Socket*.

3. To ensure proper connection between RS-485 2-wire serial equipment and the ION-E100, use the following scheme:

Equipment Serial Port	ION-E100 Serial Port
Data +	Data +
Data -	Data -
GND	GND

5 Understanding LED Status

The following describes the system status LED mappings of the ION-E100:

Normal Operation:

- Operating system boot up – *LED is steady orange (max. 30 seconds)*

- Internal application startup – *LED is flashing orange (2 second interval)*

- ION-E100 system ready – *LED is steady yellow*

- Media streaming – *LED is flashing yellow (1/2 second interval)*

Special Operations:

- Identify command received – *LED is flashing orange/yellow*

- Hardware reload default settings – *LED is flashing rapidly red/yellow*

- Software watchdog is rebooting the appliance – *LED is flashing rapidly red*

- Firmware update in progress – LED *is flashing slowly red/yellow*

Note: Under normal operation, the ION-E100 takes up to 1-2 minutes to boot up.

6 Initial System Configuration

For initial set-up, the ION-E100 needs to be configured prior to using it with your network video management system. In most cases, only network configuration will be required. Since not all ION-E100 parameters can be controlled via networked video management systems, advanced parameters may need to be set-up as well through the ION specific software tools.

The initial configuration can be done locally on the ION-E100 using a laptop directly connected to the device's network port, or remotely over the network.

6.1 Network Configuration

By factory default, the ION-E100 is configured in DHCP. If you are not using a DHCP server it will automatically allocate itself an APIPA (Automatic Private IP Addressing) address in the range 169.254.0.1 to 169.254.255.254 with subnet mask 255.255.0.0.

Initial device network configuration is done via the IonConfigTool (ICT), a tool provided by IONODES and that can be found on the company's web site.

The ICT plays 5 important roles:

1. Discovery of all ION-E100 and other ION devices on the network

2. Remote configuration of the IP address and subnet mask

3. Identify an ION device by flashing the LED (*orange/yellow)*

4. Batch firmware upgrade of all common ION devices

5. Access to the web based ION management application

Once your device is installed on your network and powered up, launch ICT from any computer on the network and the following window will be displayed:

The ICT supports 2 ways to discover a device. The first way doesn't need any configuration and uses the Bonjour discovery protocol. In order to be able to discover a device via Bonjour, the network must support multicast delivery.

If it is not the case, you can use the second way, which is the Unicast Discovery. The Unicast Discovery can be configured by using the "Unicast Discovery" configuration form. This configuration form is available via the Admin / Unicast Discovery menu option.
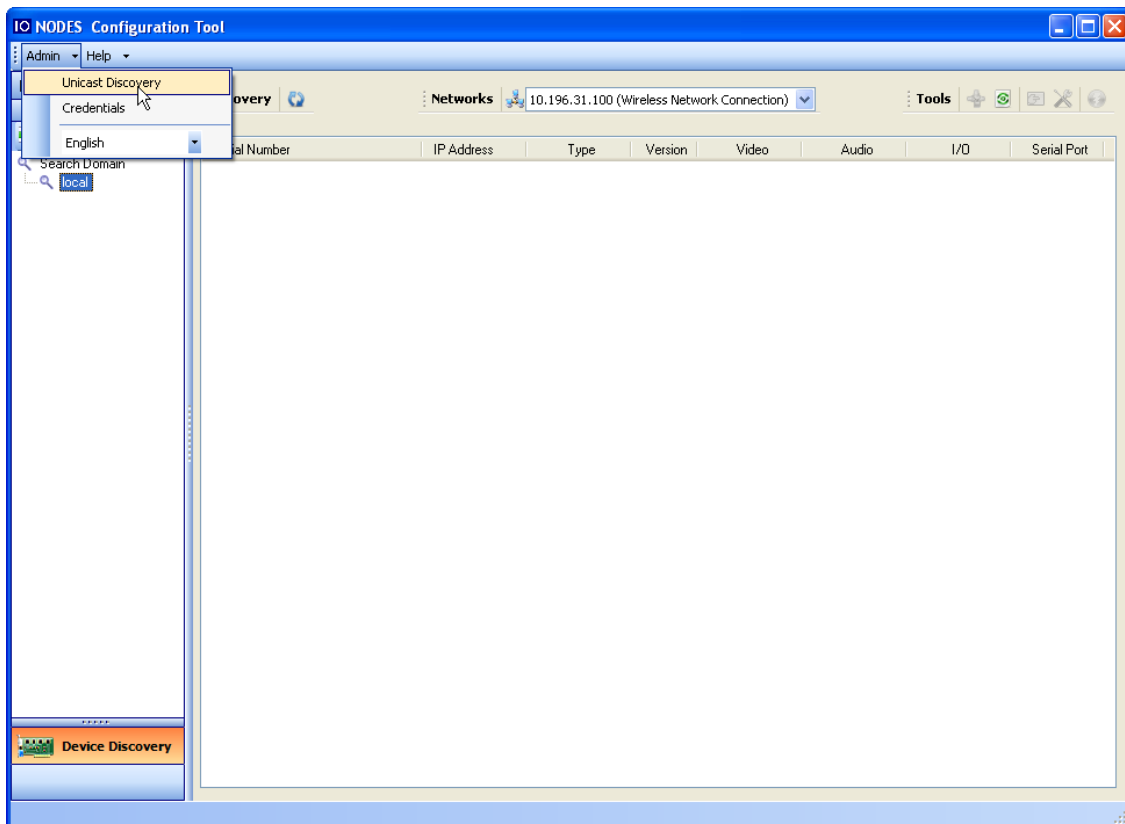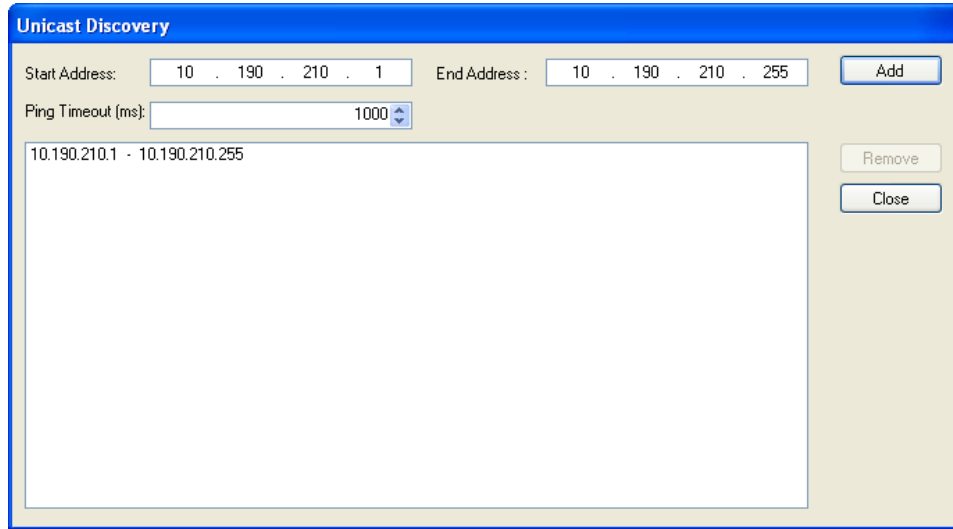
To configure the Unicast Discovery, add one or more IP address ranges. The Unicast Discovery tries to reach a device at a specific IP address in the configured ranges. The discovery can be a long process if the range of IP addresses is huge and the device is at the end of the range. To accelerate the 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.
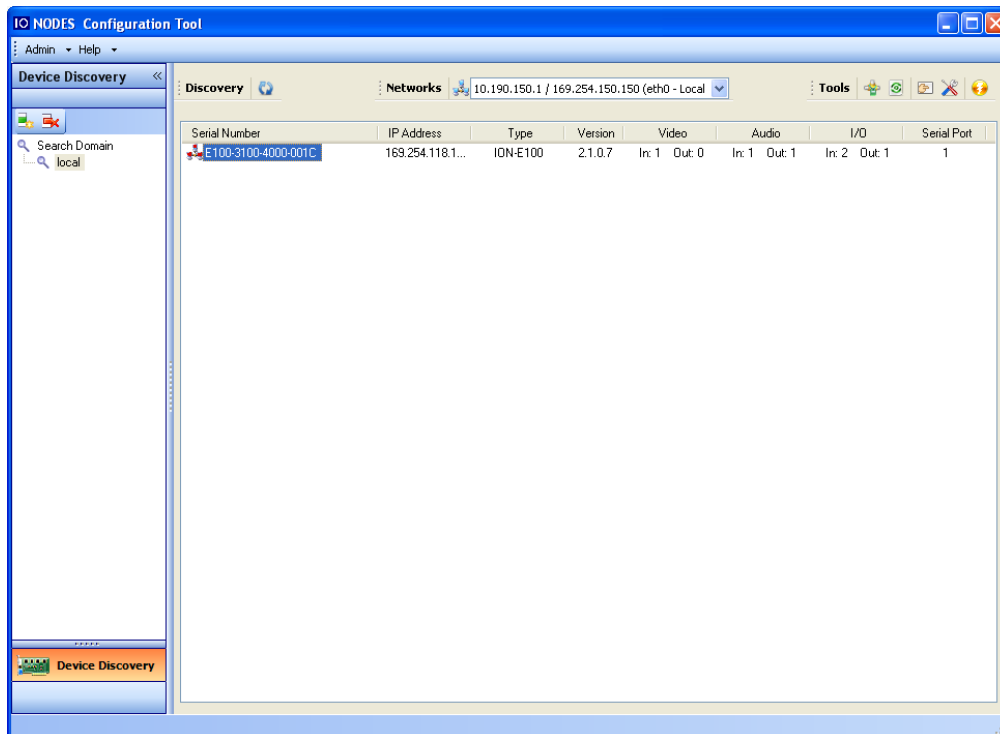
If no DHCP server was able to assign an IP address to an ION-E100, it will appear in the ICT device list with an APIPA address (169.254.*.*). If an ION-E100 displays an APIPA address it must be configured with a valid IP address before it can be remotely configured by selecting the ''Assign IP address'' from the selection list and configuring the TCP/IP settings.
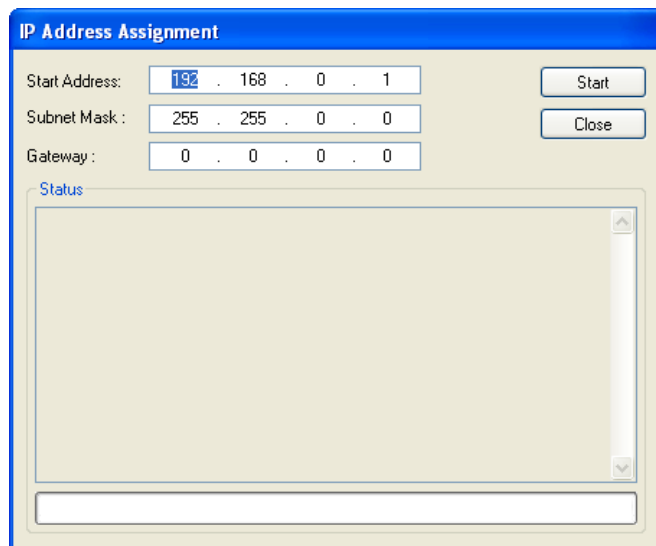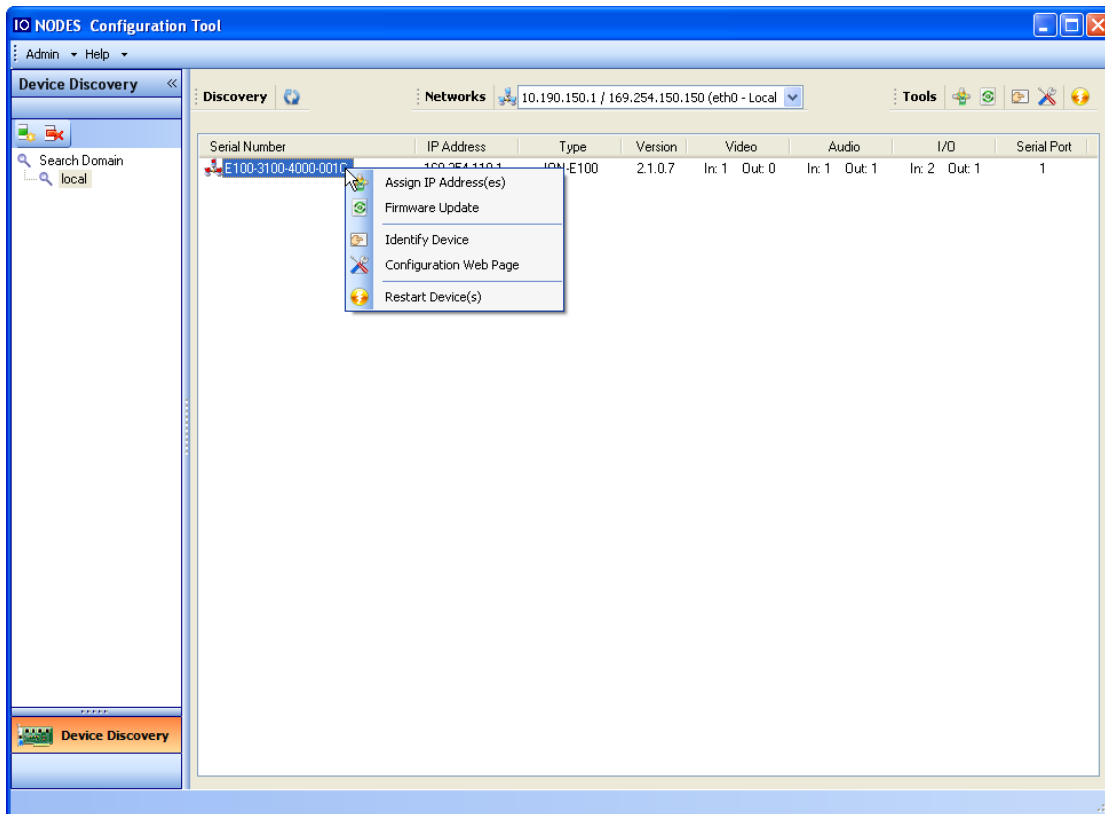
Once the IP information is set, the Silverlight web application served by the ION-E100 can be launched from the ICT or directly in your web browser by typing the device's IP address in the address bar. You can start to use your networked video management system for final system configuration or you can configure advanced parameters using the ION-E100's web based management.

6.2 Using the ION-E100 Web Application

When entering the Web Application, you will be asked a username and password. The default user name and password is '*admin*'. The following window will be displayed:
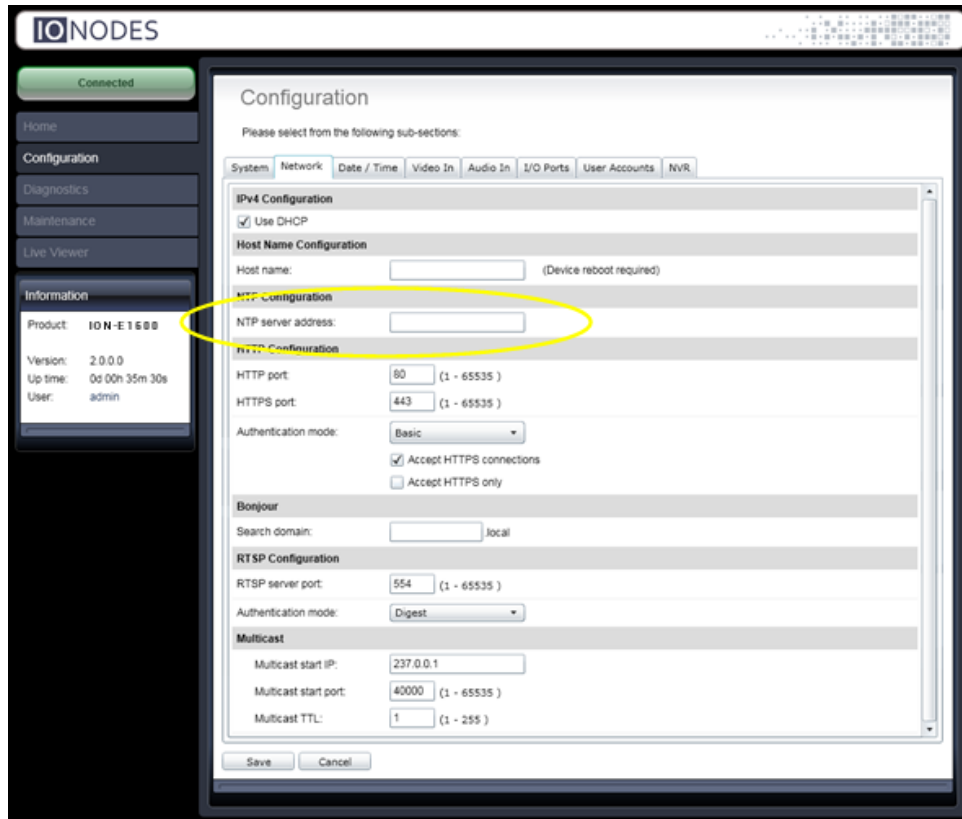

The following parameters may need to be programmed before using the unit:

1. An NTP time server address

2. Video encoder streams

Setting up the NTP server

Under the *Configuration* section, select the *Network* tab and set the proper NTP server address under the *NTP Configuration* header.

Configuring Video Parameters

You may disable any of the three (3) video encoder streams (Primary H.264, Secondary H.264 and MJPEG). All other video parameters should be configured within your NVM system.

Note: We recommend disabling the MJPEG codec if you do not intend on using this codec within your application. This will avoid turning on this stream by inadvertence and possibly affecting the performance of the H.264 codecs.
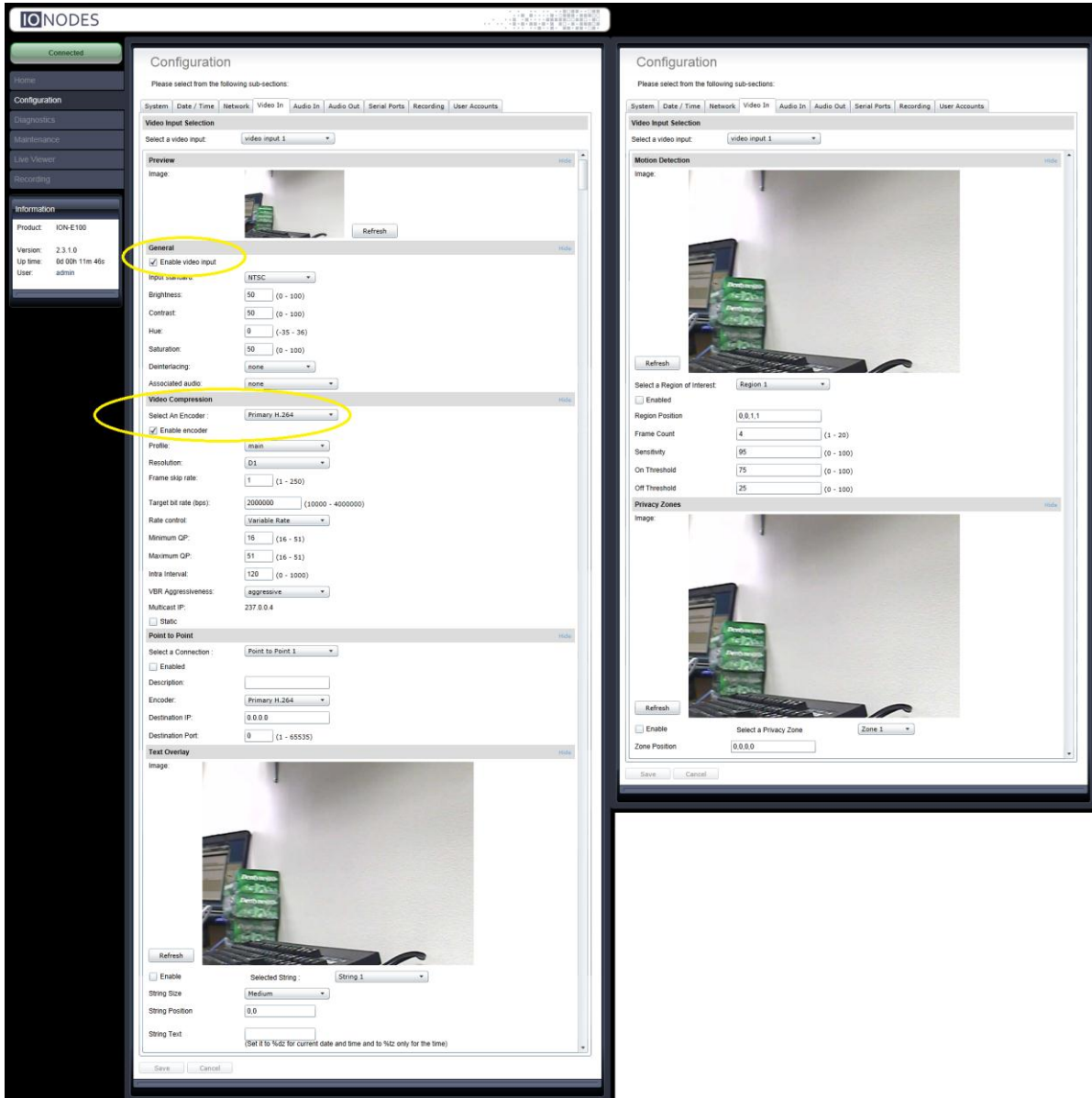
7 Performing a Firmware Update

This section describes how to update your ION-E100 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.
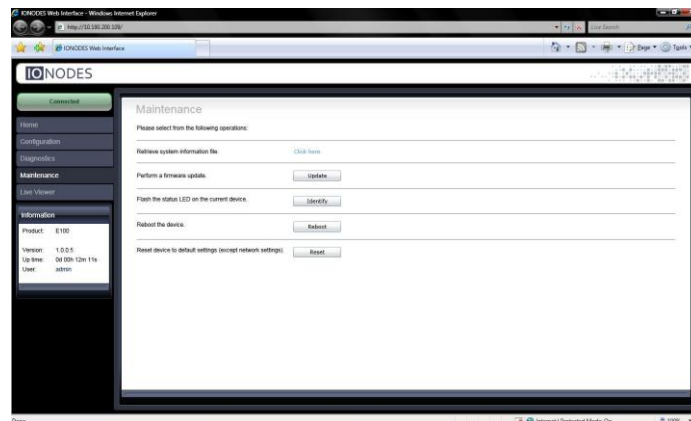

4. You will see the following messages indicating the status of the update:
   o Firmware upload in progress... (100%)
     ▪ Lasts around 95 seconds.
     ▪ Status LED is green.
   o Firmware uploaded. Saving to internal storage... (0%)
     ▪ Lasts around 45 seconds.
     ▪ Status LED is flashing red-green.
   o Validating and decompressing firmware... (0%)
     ▪ Lasts around 105 seconds.
     ▪ Status LED is flashing red-green.
   o 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.
     ▪ Status LED is orange.
   o Testing firmware stability... (26%)
     ▪ Lasts 120 seconds.
     ▪ Status LED is flashing red-green.
   o Firmware update complete. (100%)
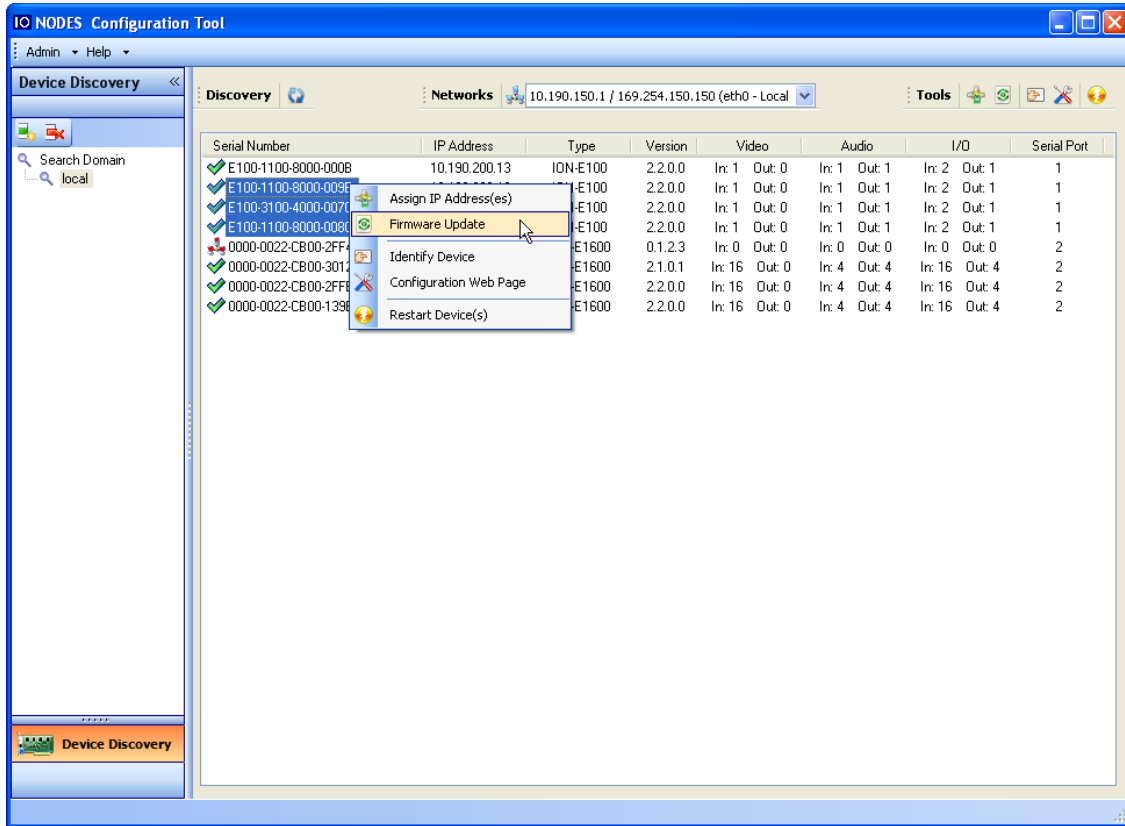
7.1 Batch Firmware Update

This section describes how to perform a batch update of multiple ION-E100 devices to newer firmware versions from the 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.
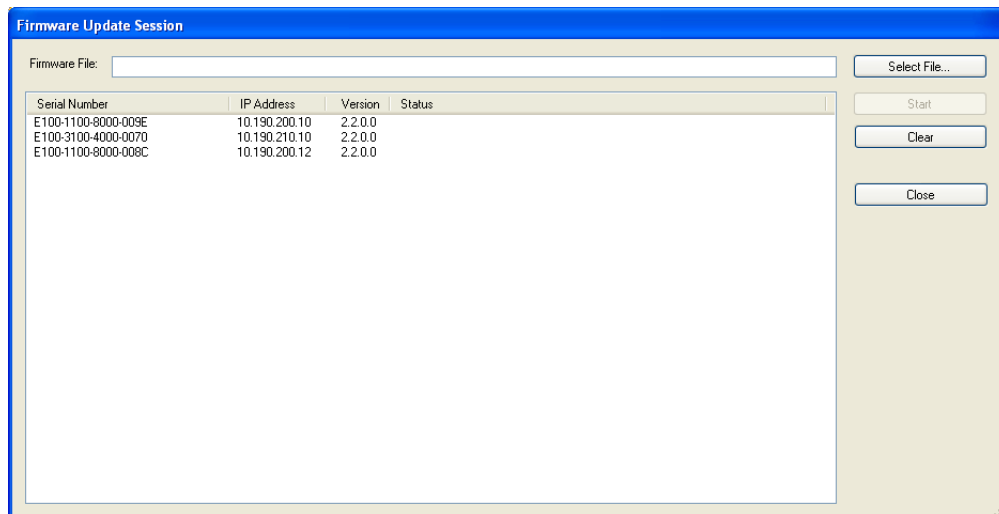
From the ICT, select one or more devices of the same type.
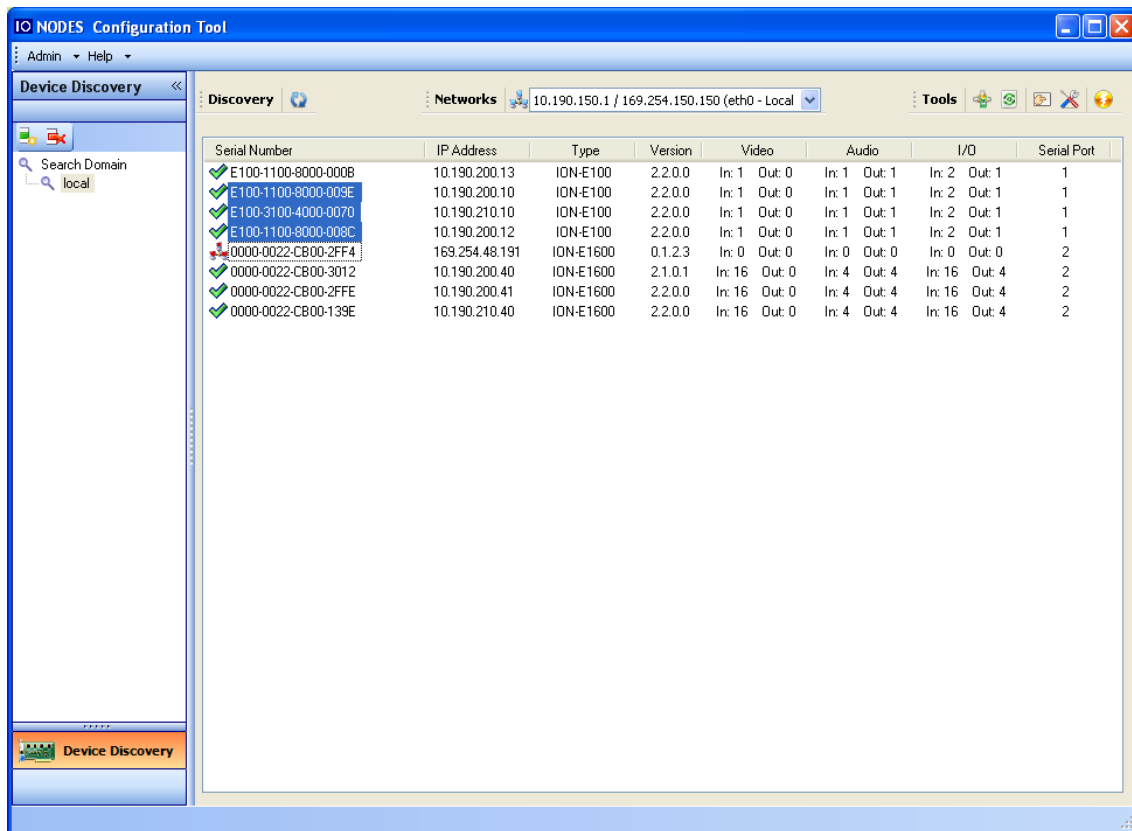
By using the right mouse button on the selected devices, choose the "Firmware Update" menu option.

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.

8 Recording on the Edge

In most setups, the ION-E100 is used to stream video and/or audio to an ION-R100 or to a central video management system (VMS). From there, the streams can be viewed «live» (in real time), recorded or both.

There are deployment scenarios that require the ION-E100 to record audio/video content to local storage instead of recording on an external video management system (VMS). There are also situations where the ION-E100 simply cannot reach the VMS for a period of time. There may be temporary network disruptions, the video management system may be undergoing maintenance, or there may be an attack on the security system in progress.

If external conditions prevent the ION-E100 from streaming its media content when it is configured to do so, the ION-E100 can record the streams locally instead. Once the situation returns to normal, the recorded content can then be retrieved from the ION-E100. Its storage capacity is limited, but depending on selected quality, it can record a few days or so of content at a time.

8.1 Configuration

Recording on the edge on the ION-E100 can be configured through the device's web application.

To view or change the recording settings:

- Open the device's web application. Enter your use name and password;
- Click on the **Configuration** tab;
- In the configuration page, click on the **Recording** tab;

The recording in the ION-E100 is configured using only a few parameters:

- **Enabled**: Determines whether recording on the edge is active.
- **Current Recorder State**: Provides information of the current state of the recorder. Possible states include *Idle*, *Rebuilding Index* and *Active*.
- **Storage Profile**: Lists the storage available for recording. When the recorder is disabled, it is also used to change the recording storage selection.

- **NVR Detection Method**: Determines how the ION-E100 is to detect when it loses its connection to the video management server.
    - ○ *Server Ping*: The ION-E100 actively polls the IP address of the server for a reply to ensure that the address is present on the network. This method is independent from the type of video management server.
    - ○ *Internal API*: The ION-E100 uses the communication protocol of the video management server to detect its presence. Currently supported: Genetec protocol.
- **Ping Timeout**: Time to go without any response from the server before declaring the connection lost. This parameter is only visible when NVR Detection Method is set to *Server Ping*.
- **Ping IP Address**: IP address of the server to poll. This parameter is only visible when NVR Detection Method is set to *Server Ping*.
- **Grooming Mode**: Determines how the recorder is to recycle storage space when the ION-E100 needs to record video on the edge.
    - ○ *Chronological*: When the internal storage space of the ION-E100 is full, the system automatically deletes older recorded video files as needed so that new video can be recorded.
    - ○ *By Input Retention Time*: When the internal storage space of the ION-E100 is full, the system automatically deletes recorded video files for which the retention period has expired. (See below.) Requires that all video inputs be configured with a retention time.
- **Maximum File Duration**: While recording video, the recorder stores video in clips no longer than this duration.
- **Maximum File Size**: While recording video, the recorder stores video in clips no bigger than this size.

The recorder also includes some per-input configuration:

- **Recording Status**: Indicates whether the video input is currently being recorded or not.
- **Record Video From**: Determines which video encoder to record for the video input.
- **Input Record Mode**: Determines under which conditions to record video from the input.
    - ○ **Do Not Record**: Never record video from the input.
    - ○ **Record Continuously**: Always record video from the input.
    - ○ **Record On Event**: Record video from the input when at least one of the following conditions is met:
        - ▪ **Record When Connection Is Lost**: Record video when the network connection to the NVR server is lost. (See *NVR Detection Mode* above.)
        - ▪ **Record On Demand**: Record video when requested manually. Manual recording can be activated from the Live Viewer web page or through the IonAPI.
        - ▪ **Record On Motion Event**: Record video when a least one motion region of the input is triggered.
        - ▪ **Record On I/O Event**: Record video when a specific I/O input pin (see *I/O Event Input*) reaches the specified state (see *I/O Event Input State*).
- **I/O Event Input**: I/O input pin to monitor for On I/O Event recording for the video input.

- **I/O Event Input State**: I/O input pin state required to activate On I/O Event recording for the video input.
- **Video Retention Time**: Period of time (in days) to preserve recorded video for the video input.
- **Force Immediate Deletion after Retention Time**: When checked, forces the recorder to delete the recorded video for the input as soon as its retention period expires, even if the recording storage is not full.
- **Mute Audio**: When checked, if the video input has audio associated to it, the audio will be muted.

8.2 Audio Recording

Video recording can be configured to simultaneously record an associated audio input stream. This said, the system does not allow you to ONLY record audio content, it can only allow you to record audio in addition to a video stream.
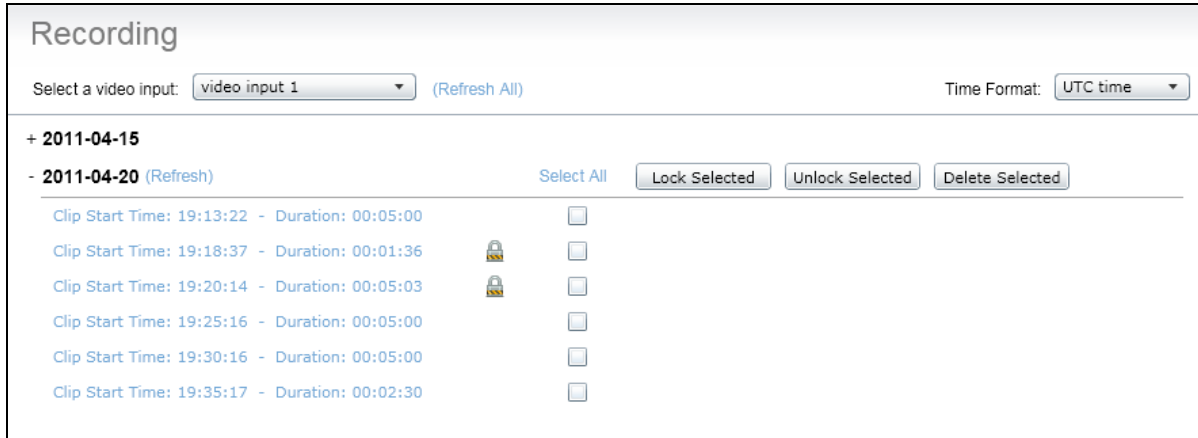
The association between an audio input and a video input is done as follows:

- Open the device's web application. Enter your use name and password;
- Click on the *Configuration* tab;
- In the configuration page, click on the *Video In* tab;
- Locate the configuration parameter called *Associated audio* and select the audio input you wish to associate with the video input.
- Click on the *Save* button to save your changes.
- The associated audio input will now be recorded simultaneously to its parent video input.

8.3 Retrieval / Management of Video Clips

Recorded video on the ION-E100 can be retrieved through the device's web application. To view and manage the list of recorded video clips:

- Open the device's web page. Enter your use name and password;
- Click on the «Recording» tab;

8.3.1 Displaying Clips

When you select a video input, the web application displays a list of dates with video recorded from that input. To display the list of recorded video clips for a specific date, simply click on the date. Click on the date once more to collapse the list of recorded video clips for that date.

By default, the clip start times are displayed using UTC time. If you want to see the start times in their local time equivalent, simply select «Local time» in the Time Format setting.

8.3.2 Downloading Clips

To download a video clip, simply click on the clip's description. The video clip can then be played on the user's PC using an appropriate video player. Downloading a clip does not remove the file from the device.

8.3.3 Locking And Unlocking Clips

A locked file cannot be deleted. This serves as a protection against accidental deletion of important clips.

When the recording on the edge needs to perform grooming (see Configuration above), the device checks for locks and will never delete locked clips when it needs to free up storage space.

To lock one or more video clips, you must first select each clip by clicking on the check box on its right. If you want to select all the video clips for a day, you can also click on «Select All» associated with that day. When you have selected all the clips you want to lock for that day, click on the button «Lock Selected». If you want to lock clips from more than one day, you must repeat the process for each day.

Locked clips have a lock icon besides them.

To unlock one or more video clips, select the video clips then click on «Unlock Selected».

8.3.4 Deleting Clips

To delete one or more clips for a day, select each clip you want to delete then click on «Delete Selected». If you want to delete clips from more than one day, you must repeat the process for each day.

Trying to delete a locked clip does nothing. If you want to delete locked clips, you must first unlock them.

9 Point to Point Connections

Point-to-point connections between an ION-E100 and an ION-R100 can be configured using the device's web application.

In the ION-E100's web application, in the **Configuration** section, go to the **Video In** tab and select «video input 1». Scroll down all the way to the bottom of the configuration page. The last 3 sections are named **Point to Point 1**, **2** and **3**.

Here's a quick overview of the settings available for a connection:

- Enabled: Indicates whether this connection is to be used.
- 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. Possible values include «H.264 High-Quality» and «H.264 Low-Quality». These values refer to the encoders configured in previous sections of the same web page.
- Destination IP: Address where to send the video. This is usually the address of an ION-R100. The destination can also be a multicast group address. DNS names are not yet supported, only IP addresses.
- Destination Port: Network port where to send the video. This value must match the port value in the ION-R100.

Once all the settings have been set, click on **Save** at the bottom of the page to apply them. The ION-E100 then creates or updates the connection as needed.

Annex A – Configuration Parameter Reference

1. Video Input Configuration

   - **Hue** - The hue filter allows you adjust the hue of an entire image. Hue is the color reflected from or transmitted through an object. It is measured as a location on the standard color wheel.

   - **Saturation** – The saturation filter, sometimes called chroma, allows you to adjust the strength or purity of color of the video input. Saturation represents the amount of gray in proportion to the hue. On the standard color wheel, saturation increases from the center to the edge. The saturation filter lets you adjust the saturation of the entire image.

   - **Brightness** – The brightness filter allows you to set the black level of the captured video input. It controls the darkest detail that you can see, and how dark those details look. If it is set too high then everything will seem washed-out and dull and if it's set too low then you won't be able to see the detail in shadows.

   - **Contrast** – The contrast filter is usually configured once brightness is adjusted. Contrast allows you to control how bright the bright details get on the captured video input.

   - **Deinterlacing** – The deinterlacing filter is used to convert interlaced video, such as common analog video signals, into a non-interlaced form that can be viewed on progressive displays such as computer monitors.

   - **Video Standard** – The video standard allows you to select the video source as NTSC or PAL.

   - **Audio Association** – This parameter allows you to associate a specific audio input with this video input.

- **Enabled** – This parameter allows you to enable or disable a video input.

2. Video Codec Configuration (H.264 & JPEG)

- **Enabled** – This parameter allows you to enable or disable a video codec.

- **Resolution** – Allows you to select the video resolution of encoded images.

- **Target Bit Rate** – Allows you to select the target bit rate to be used by the codec.

- **Enabled** – This parameter allows you to enable or disable a video codec.

3. JPEG Specific Codec Configuration

- **Frame Rate** – Allows you to specify the frame rate to be used by the codec. In JPEG, this frame rate will be guaranteed regardless of the rate control setting.

- **Quality** – Allows you to select a value for quality of JPEG compression from 0 to 100. The higher the value, the better the quality. This setting is only applicable if the Rate Control parameter is set to Fixed Quality.

- **Rate Control** – Allows you to choose between **Variable Bit Rate** and **Fixed Quality**. The first option will instruct the JPEG codec to prioritize bit rate over quality. The second option will instruct the JPEG codec to use the specified quality setting and vary bit rate accordingly.

4. H.264 Specific Codec Configuration

- **Profile** – Allows you to select the H.264 codec profile from **Baseline**, **Main** and **High** profiles. Baseline: does not contain all the optimization that enhances the visual quality of the video. This profile is the one requiring the least video processing power. Main: Adds in-loop deblocking filter and CABAC encoding. Requires more processing power to encode and decode. High: Adaptive 8x8 or 4x4 transforms on the image.

- The visual difference is much greater between baseline and main then between main and high. Also, the differences appear only when the visual quality begins to degrade (ex: when the quality begins to degrade on baseline profile, switching to main profile will restore some of the image quality).

- **Frame Rate** – Allows you to specify the frame rate to be used by the codec.

- **Rate Control** – Allows you to choose between **Variable Bit Rate** and **Constant Bit Rate**. The first option will instruct the H.264 codec to dynamically adjust the bit rate in order to meet both the target quality (QP) and frame rate settings. The second option will instruct the H.264 codec to prioritize target bit rate and vary quality (QP) first and frame rate as a last resort.

- **Min/Max QP** – This parameter allows 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.

- **VBR Aggressiveness** – This parameter allows you to specify if the codec should take into account the level of motion in the image for bit rate calculations. You can select from **Conservative, Moderate** and **Aggressive** options for this setting. Using the first option, the codec will allow bit rate to drop up to ¾ of the configured target bit rate when no motion is detected in the image. Using the second option, the codec will allow bit rate to drop up to ½ of the configured target bit rate when no motion is detected in the image. Using the first option, the codec will allow bit rate to drop up to ¼ of the configured target bit rate when no motion is detected in the image. You can disable this feature by selecting the **disabled** option.

Annex B – Troubleshooting Guide

- **Device does not seem to boot-up**
    - o Verify that a 12V (40W) power supply is connected to the device.
    - o If using PoE, verify that the RJ45 network link is properly providing power.
    - o When a valid power source is detected, the status LED will light up.
    - o Verify the status of the system status LED to determine the state of the device as it powers up.

- **Cannot discover the device or communicate via the network**
    - o Before the device can be discovered, the status LED must be lit YELLOW as this indicates ready state of the device.
    - o Make sure you have connected the device to your network.
    - o Make sure the GREEN LED on the RJ45 connector is lit. If it is not lit, verify the network connectivity with the network switch.
    - o Dynamic discovery of the ION-E100 requires multicast networking to be supported by your network and switch equipment. (Bonjour protocol)

IONODES

Annex C – Statement Limited Warranty

The warranties provided by Ionodes Inc. (Ionodes) in this Statement of Limited Warranty apply only to ION-E100 products purchased from an authorized Ionodes Inc. (Ionodes) Reseller, Integrator or Distributor and returned from European, Asian or North American countries, and excludes all Latin American countries. The term "ION-E100" means an ION-E100 module, any module upgrade, or accessories, or any combination of them. The term "ION-E100" does not include any software programs, whether pre–loaded with the ION-E100, installed subsequently or otherwise, and any installed Micro SD Card, which are covered by a separate Limited Warranty. Nothing in this Statement of Warranty affects any statutory rights of purchaser that cannot be waived or limited by contract. If you have any questions regarding this Limited Warranty, contact Ionodes Inc. and its resellers. The Warranty period for the ION-E100 is 2 years from date of billing for the ION-E100 product.

The Ionodes Warranty for ION-E100

Ionodes warrants that each ION-E100 is free from defects in materials and workmanship, and conforms to the ION-E100 Official Published Specifications (See http://www.ionodes.com for details). The warranty period for an ION-E100 is a specified, fixed period commencing on date of billing by Ionodes for the Product. If a valid proof of billing cannot be found, the warranty may be void by Ionodes Inc. or measured from the date the ION-E100 has shipped from a Ionodes Depot center based on its serial number.

If, during the warranty period, the ION-E100 is not in good working order, Ionodes will, at its option, repair or replace it at no additional charge, except as is set forth below. In some cases, the replacement product may not be new and may have been previously installed. Regardless of the replacement product used, Ionodes' appropriate warranty terms apply. In case Ionodes or your reseller are unable to repair an Ionodes ION-E100, you can alternatively ask for a partial refund as far as justified by the reduced value of the unrepaired ION-E100 or ask for a cancellation of the respective agreement for such ION-E100 and get your money refunded.

Extent of Warranty

The warranty does not cover the repair or exchange of an ION-E100 resulting from misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by the end user, or failure caused by a product for which Ionodes is not responsible. The warranty is voided by removal or alteration of ION-E100 or parts identification labels, but not by the installation or replacement of Micro SD medium.

THESE WARRANTIES ARE YOUR EXCLUSIVE WARRANTIES AND REPLACE ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Items Not Covered by Warranty

Ionodes does not warrant uninterrupted or error–free operation of an ION-E100. Any technical or other support provided for an ION-E100 under warranty, such as assistance via telephone with "how–to" questions and those regarding ION-E100 set–up and installation, will be provided WITHOUT WARRANTIES OF ANY KIND.