Silver
Stream-In / Stream Out
RCA/XLR version

User manual

System Release 1.0.4 | Document Version 0.9.5 | release/update: October 2012

DECLARATION OF CONFORMANCE

Established following the Directives 99/5/EC and 2006/95/EC

We, hereby, certify that Silver Stream-In / Stream Out complies with the dispositions of the European Community Directive for harmonized standards within the Member States related to radio equipment and telecommunications terminal equipment (Directive 99/5/EC) and low voltage (Directive 2006/95/EC).

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

Installation and Operational Manual:

Silver Stream-In / Stream-Out User Manual

System Release 1.0.4 paired with NMS #1162 / October 2012

Warranty

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How to get support

If you have a technical question or issue with your APT equipment, please consult the support section of our website at:
http://www.aptcodecs.com

or apt-cust-support@worldcastsystems.com

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Table of Contents

This is the main table of contents of the entire User Manual. It presents the main topics of each section of this document.

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Safety & Disposing Information

The Silver Stream-In / Stream-Out IP-Audio devices are powered by an external switching power adapter. If a product defect occurs on the power adapter this adapter must be replaced. There are no user-serviceable parts inside.

TO PREVENT THE RISK OF ELECTRIC SHOCK, DO NOT OPEN THE COVER OF THE POWER ADAPTER THERE ARE NO USER-SERVICEABLE PARTS INSIDE THIS UNIT. PLEASE REFER SERVICING TO QUALIFIED APT SERVICE PERSONNEL.

According to local laws and regulations this product should not be disposed of in the household waste but sent for recycling.

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1.0 Introduction

1.1 About this Manual

Thank you for purchasing the Silver Stream-In/Stream-Out audio Codec from APT. We have developed these units to be as user friendly as possible, and they contain many advanced features which are designed to make the use of this product simple and straightforward.

This operations manual is intended for operators of the Silver Stream-In/Stream-Out audio network transmission link. This manual describes the function, the installation and use of the unit.

It is recommended that new users of the Silver Stream-In/Stream-Out should read the full manual before switching it on for the first time, to get a better feel for the functionality and to eliminate any possible area of confusion.

1.2 Release Notes

This manual is the primary reference covering the configuration, installation, operation and troubleshooting of the Silver Stream-In/Stream-Out.

As of this publication date, this document is the current manual revision. We recommend that you check with your distributor or on the APT website for updates to firmware and this manual..

Notes:

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1.3 Company Profile

APT is a pioneering designer of audio Codecs for broadcast professionals and telecommunications companies worldwide. The company's WorldNet and WorldCast Codecs offer reliable and cost-effective broadcast solutions delivering high quality audio over IP, T1, E1, ISDN and Leased Lines.

Designed for use in studio transmitter links, studio networking and remotes / OB applications, the APT Codec portfolio includes a wide range of stereo and multi-channel units that can be deployed as a simple STL or a large-scale IP audio network.

Our Codecs have been selected by many leading broadcasters worldwide. Operating in the fast moving broadcast technology market, APT acknowledge the importance of significant investment in R&D to ensure our product offering meets the needs of rapidly changing market conditions. Many countries worldwide are upgrading their infrastructure in line with the three current trends: Digital / HD Radio, Audio over Internet Protocol and Surround Sound for Radio, and APT has solutions for each of these areas. Thanks to this focus on innovation, our products have been selected as winners of prestigious industry awards by Radio World and Radio Magazine.

APT offers both depth and breadth of experience to its customers within the broadcast industry. Throughout its 20 year history, the company has worked with major public and commercial broadcasters on many pioneering audio transport projects and is focused on providing practical and reliable solutions to the challenges of modern broadcasting.

APT is part of the WorldCast Systems group of companies which combines the collective expertise & extensive product portfolio of several major broadcast brands to offer turnkey systems in all major analog and digital technologies. Other brands within the group include:

- **Audemat** who designs monitoring equipment for analog and digital radio and TV as well as an extensive range of facility remote control solutions.
- **Ecreso** who design a range of highly efficient transmitters for broadcast transmission technologies such as FM, DAB/ DAB+/ T-DMB. Both liquid- and air-cooled options are available.

As such, WorldCast Systems can offer complete broadcast solutions for the delivery, transmission and monitoring of broadcast content throughout the broadcast chain.

The group is founded on three core values:

1. **Product innovation:**
   Audemat places a key emphasis on Research & Development and its innovative approach has been repeatedly recognized by the industry. WorldCast Systems has won awards for innovation at consecutive NAB Shows for over 10 years.

1) **Customer satisfaction:**
   Audemat is dedicated to ensuring the best quality, value and service for its customers and has achieved IS0 9001 certification.

2) **Sustainable Development:**
   Audemat is committed to sustainable development and demonstrates this commitment in several ways: it has been ISO 14001 certified since 2007, adheres to the UN Global Compact project and all new products are developed in keeping with an eco-design philosophy and built within Audemat's low energy consumption factory.

Headquartered in Bordeaux-Merignac, WorldCast Systems employs over 100 people worldwide with sales offices in England, Germany, Norway, India, Brazil and the US. A global distributor network serving works together with our international sales and support staff to offer local assistance to our customer base. All APT product development and R&D takes places in Belfast, Northern Ireland.

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1.4 Unpacking and Inspection

After unpacking:

- Check the unit for damage during shipping. Immediately report any damage back to the distributor or APT.
- Check that the list of contents is complete as follows:

Silver Stream-In / Stream-Out

Serial Number located on the rear panel:

Stream-In/RCA:	**I000-**
Stream-Out/RCA:	**P000-**
Stream-IN/XLR:	**K000-**
Stream-Out/XLR:	**R000-**

(please complete)

- **External Power Adapter**

  Please confirm that the local power supply voltage matches the required voltage levels of 100-240VAC

- **CD Box**

  A CD box including a Quick Start guide and a CD where you will find the documentation for this product.

If the equipment supplied does not match the items requested please contact APT or your local distributor immediately and report any shortages.

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2.0 Silver Stream-In/Stream-Out at a Glance

This section provides an overview of the Silver IP Encoder (Stream-In) and the IP Decoder (Stream-Out). It outlines how you can start using these Codecs to send audio. Section 3 contains more detailed information on the operation and how the Codec systems can be controlled by the new WEB based Management System.

2.1 Introduction

The Silver audio Codec range is based on the new APT Codec core engine. This new engine is designed to be as flexible and versatile in use as possible. The core is powerful and addresses more than ever the needs of professional IP audio transmissions.

The set of Silver Stream-In and Stream-Out can be used to setup a full duplex link. The Silver Codec range consists of the Encoder (Stream-In) and the Decoder (Stream-Out) as separate units in a ½ 1U format.

As a multi-algorithm audio Encoder or Decoder it is offering conventional analog left and right audio connections operating through IP. These analog audio connections are carried out for semi-professional phone jacks or as professional XLR connectors.

In the first instance the new Codec generation incorporates the enhanced versions of the apt-X® algorithm (real time transmission on the network with data reduction by factor 4:1) and Linear PCM 16 and 24 bit. More audio algorithms will be available optionally on coming firmware releases.

The units are capable of delivering high quality audio used for inter-studio networking, remote/outside broadcasts and STL/TSL monitor applications. Enhanced apt-X® offers 16 and 24 bit operation as an improvement over the performance of the original standard 16 bit apt-x® algorithm.

Audio modes and bandwidths are dependent on the network bit rate, the algorithm, mode and frequency response selected and the bit resolution of the desired audio. Bandwidths will range from 3.8 to 22.5 kHz in stereo mode and 7.6 to 22.5 kHz when set for mono operation.

The Silver Codec range runs an embedded WEB GUI which can be accessed from a web browser. It will be also fully software driven via APT's WorldCast Codec Management System which runs on a PC connected via LAN or WAN. A headphone socket provides for additional monitoring of the audio input or the output.

An Additional interface allows for the connection of auxiliary data terminated on a DB-9way connector. Regardless of using the Encoder (Stream-In) or the Decoder (Stream-Out) the AUX Data link is provided always as a duplex link (while the audio is always simplex).

The Silver Stream-In and Stream-Out come with the SureStream option applied as standard.

Both units are very similar with the exception that the Decoder offers an additional USB port for future use (e.g. playing out stored audio files).

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2.2 System Options

The following soft- and hardware options are available:

- Algorithm package (available in later releases)
- Advanced Audio Backup: play out from USB storage (on Stream-Out only)

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2.3 Getting Connected

This chapter outlines how you can quickly connect your Silver Codec and start sending audio. Begin by connecting the power adapter to the unit.

Making a connection and send audio:

- Set up the Silver Stream-In Encoder and the transmitting IP stream
- apply this configuration to the unit
- Set up the Silver Stream-Out Decoder and the receiving IP stream
- Apply this configuration to the unit

The audio connections are made on the rear panel using RCA phone jacks or XLR type connectors.

Stream-In / RCA

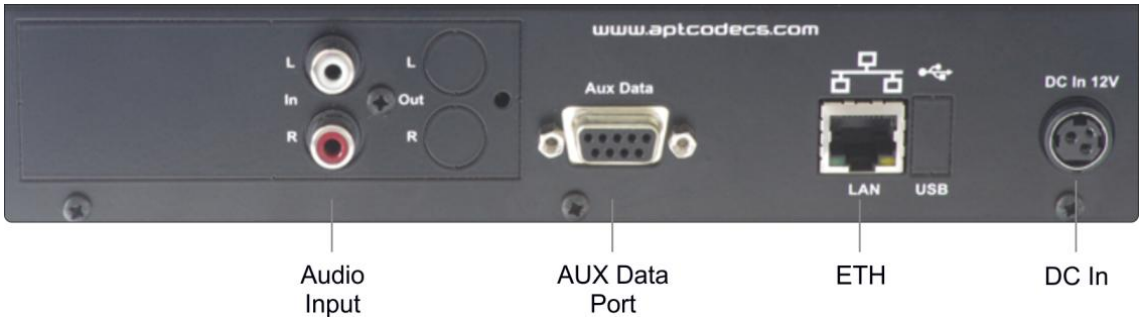

Figure 2-1: Silver Stream-In (Encoder RCA version) rear panel view

Stream-Out / XLR

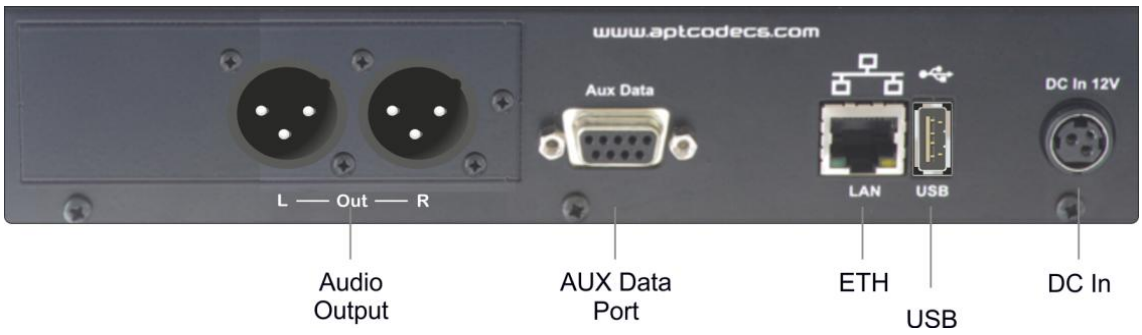

Figure 2-2: Silver Stream-Out (Decoder XLR version) rear panel view

ⓘ ***Note**: Silver Stream-In/Stream-Out are both available with XLR connectors*

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2.4 The WorldCast Codec Management System - Overview

The WorldCast Network Management System (NMS) allows viewing multiple units from one control point. The program has an intuitive look and feel that is easy to understand by both the experienced technician and the casual user.

The graphical user interface provides access to an embedded WEB GUI to the Silver IP Streamer when accessed from the NMS family tree view. The presentation of the GUI of the Silver units is the same when opened from the family tree view (NMS) or directly from a WEB browser.

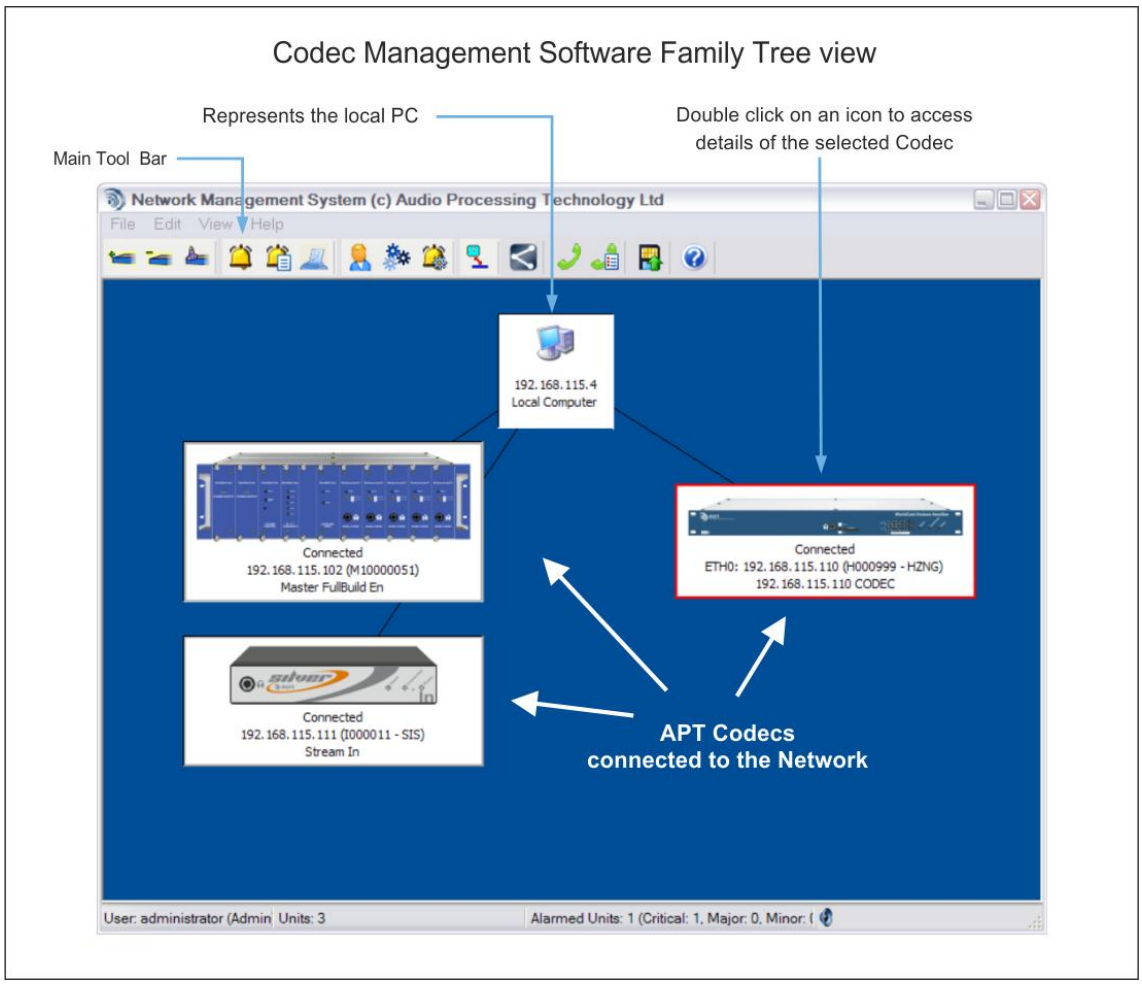

Figure 2-3: Family Tree of the Network Management System (NMS)

The presentation of the Silver configuration pages is the same whether it is opened from the family tree view (NMS) or directly from a WEB browser.

The NextGen codec range provides a context menu by right-clicking on the device (once it is connected). This context menu provides an option called "Open Free View" – this option opens as many independent views of the GUI as required but only one instance in read-write mode. All other instances are locked to read-only mode.

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The Codec Management System – *(continued)*

The Codec Management System is designed to operate as a program under Windows as a single task. This means that only one instance of the NMS software can be installed on the same PC.

Nevertheless, it's possible and allowed to have more than one installation of the NMS in the network. The NMS software design does not allow a simultaneous access to the same Codec device from different seats. If one seat has opened a Codec device on the family tree, the software inhibits any attempt of accessing the same unit from another seat in read/write mode. The first user gets the read-write control of this particular device, and any other user will be prompted to be restricted on read-only permissions. This feature avoids configuration conflicts caused by several seats.

Whenever a user opens a device on the family tree, the NMS sends out a broadcast request/announcement to the network looking for any other user actually configuring this particular unit.

If the network does not allow broadcasting, i.e. in public domain networks like the internet, this protection becomes ineffective.

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2.5 Installing the Network Management System

Prior to installing and running the NMS software, please ensure that your service PC meets the minimum hard- and software requirements:

- Microsoft Windows® XP, Windows® Vista, Windows® 7
- 30 MB free Hard Disc space
- 1024 px x 768 px Screen Resolution or better
- CD ROM Drive (optional)

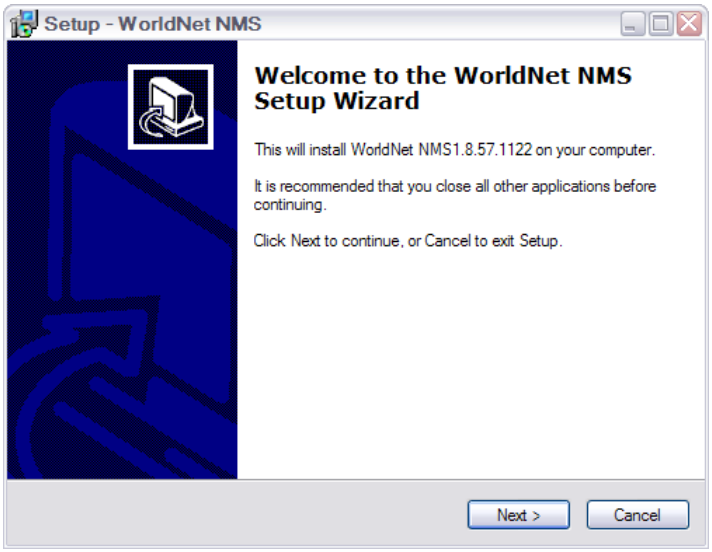
*Running any NextGen-Codec with the current system release on the NMS software requires the NMS build version **#1162** or higher (supplied with the Codec).*

The NMS requires IP port 7777 and 7778 to be opened on your network!

The NMS software is generally supplied as a self-extracting application. Run the application and follow the instructions of the following screens:

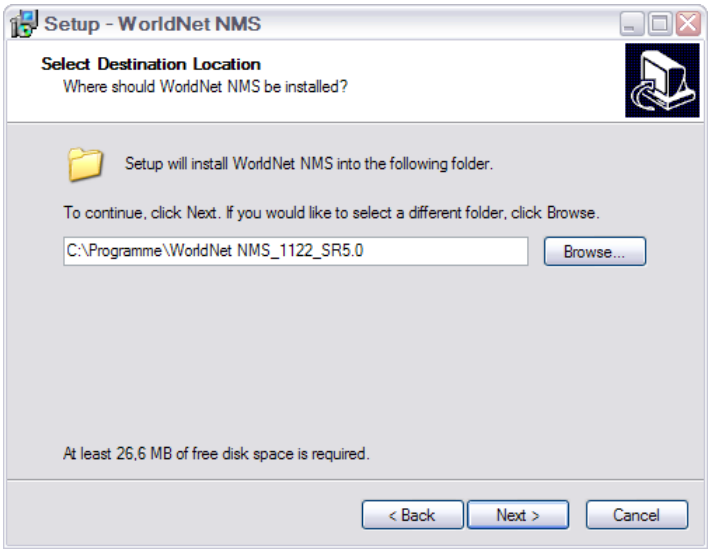
First Screen

It shows the NMS build version; please make sure that you're installing the correct version, here #1122 (NextGen Codecs require NMS #1043 or higher!).



Next Screen

Please choose the folder where you like to install the NMS application.



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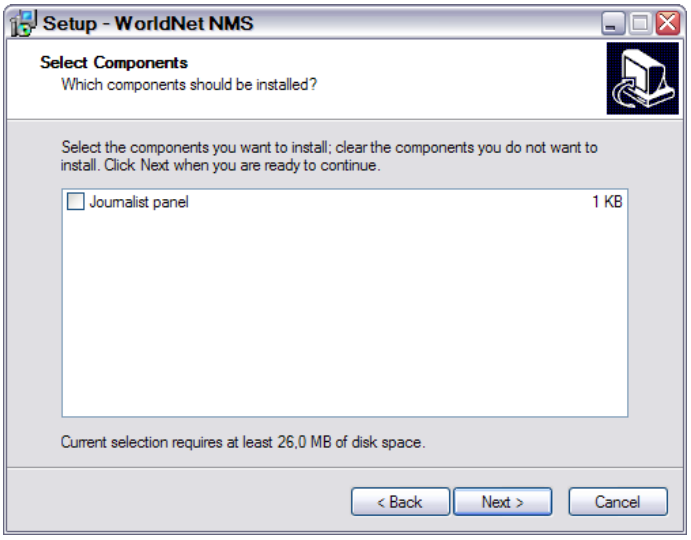
Installing the Codec Management System *(continued)*

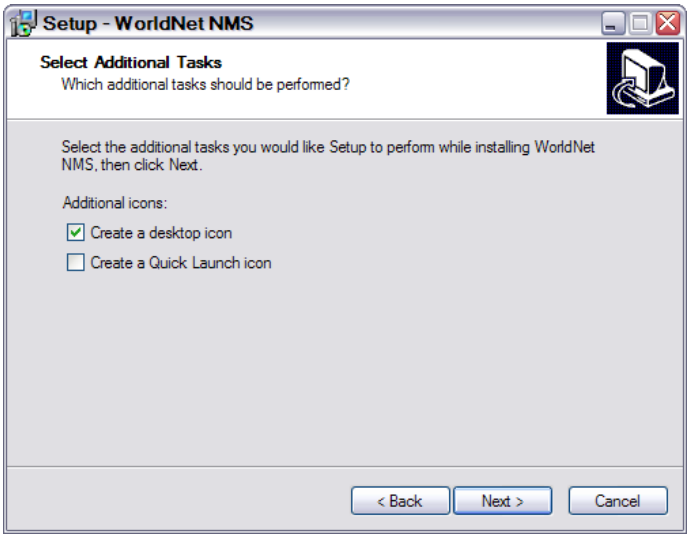
Next Screen

Journalist Panel is available for Eclipse/Meridian type Codecs only – do not select it unless you are also running Eclipse or Meridian units in your network.



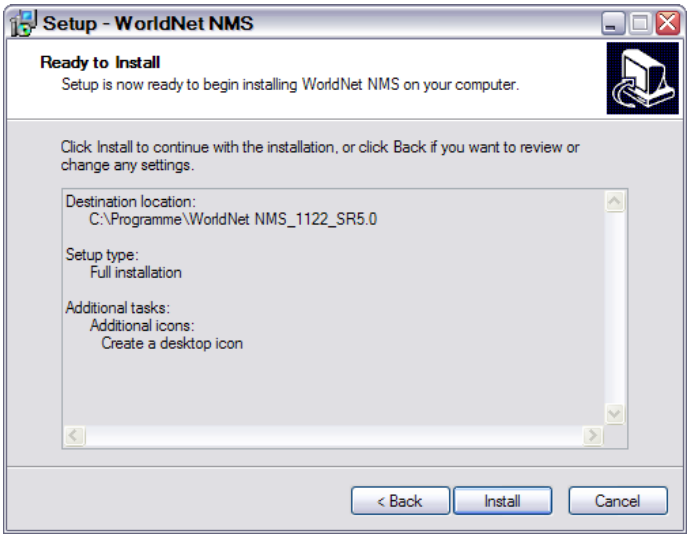
Next Screen

You can create a desktop and/or a quick launch icon as required.



Final Screen

Now you need to complete the installation by clicking on "Install".



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2.6 Getting Started

Before you can launch the Management System please ensure the following pre-conditions of your network settings:

ⓘ *To get started with the NMS application, ensure that the cabling is properly connected from the Codec to the PC, and that your service PC's Ethernet cards has an IP address within the range of 192.168.100.0 to 192.168.100.255. The Silver Stream-In and Stream-Out are set to an IP address within this range as a factory default – usually 192.168.100.110.*

ⓘ *The NMS application will remain inactive until a link is established between the service PC and an active Codec device.*

Release Notes

As of this publication date, system release 1.0.4 is shipped with the Codec device. We recommend that you check the APT website for updates.

Launch the Management System application. You will find the program located in the Windows Start Menu under "Program ➔ WorldNet NMS". Start the program and you will be prompted to log in:

NMS Log-In:

There are three levels of access to the WorldNet Codec Management System:

All accounts, the "Administrator", "Normal" and the "Read Only", require Username and Password login. When shipped only an Administrator account is configured with the default login. We recommended that you change the Administrator login as soon as possible.

Default Username: ***administrator***
Default Password: ***password***

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Getting started (*continued*)

Once you have logged in successfully the Main Screen of the Network Management System (the NMS Family Tree) will appear:

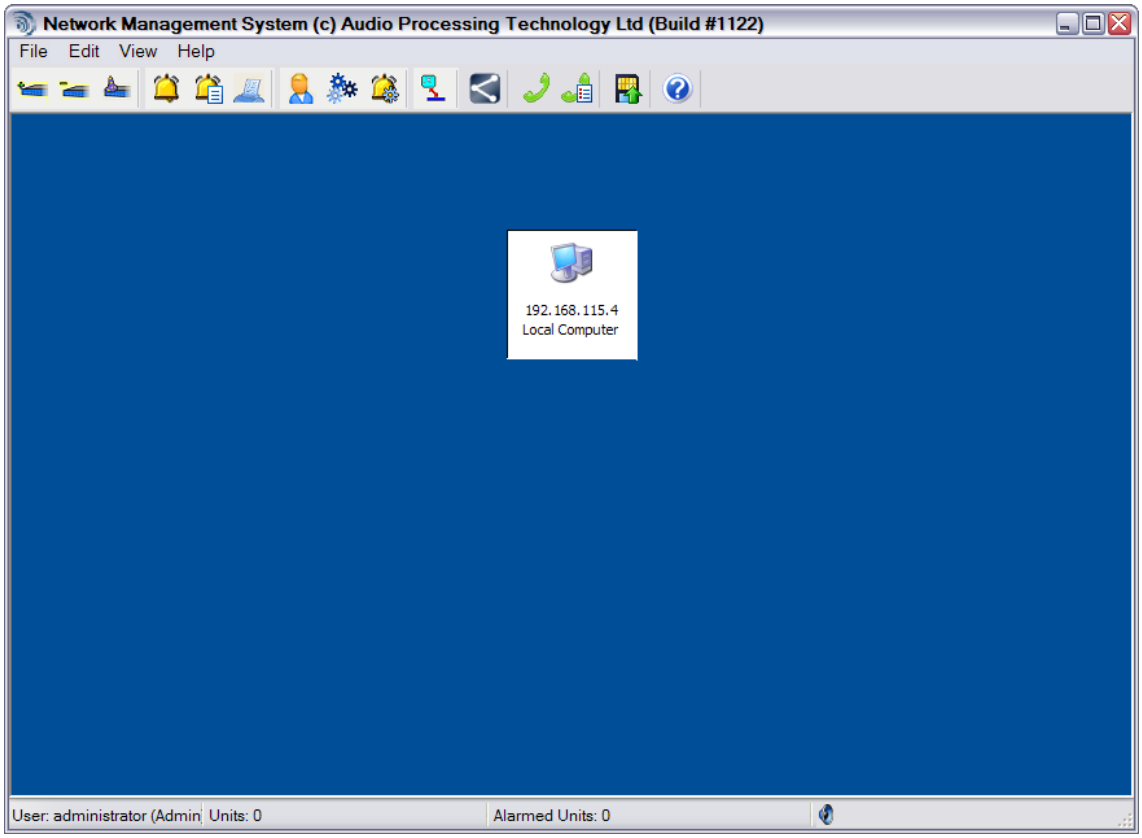

Figure 2-4: The NMS Front Page appears empty, when you log in for the first time

Note: *When running the NMS for the first time, this main screen will not show any Codec devices.*

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2.7 Along the Main Tool Bar

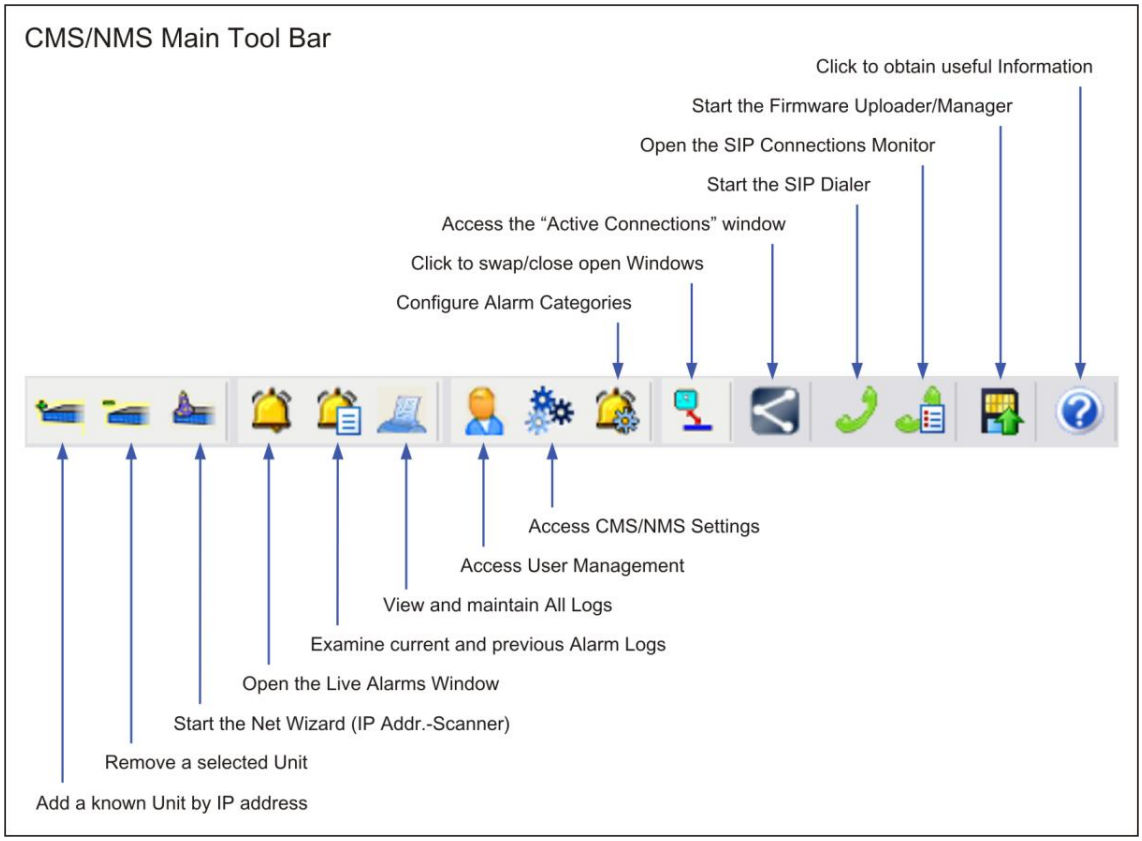
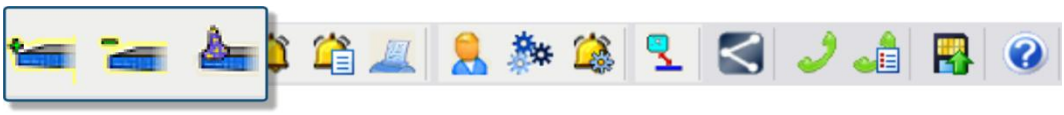


Figure 2-5: NMS Tool Bar – functional overview

The tools and controls on the Main Tool Bar are mainly used for higher level operations and management rather than controlling a dedicated audio Codec. Connected audio devices are configured and managed with an individual set of controls depending of the Codec type.

ⓘ *Depending on the connected Codec devices, not all of the tool bar functions are relevant for the particular codec; some features are not supported at all or not yet supported by different Codes.*

2.7.1 Connecting a Codec to the Family Tree



The NMS allows adding Codecs to and removing Codecs from the Family Tree.

The Main Screen will appear without any Codec attached to the Family Tree for the first time. The first option provides a quick way to attach a Codec with a known IP address to the NMS. Clicking on "Add Unit" opens the "Add New Unit" window. Enter the IP address of the Codec that you wish to connect and click "Add". This window also provides access to the Net Wizard and offers some options of the unit types; the "AutoDetect" radio button is selected as default and automatically chose the correct type of Codec.

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Connecting a Codec to the Family Tree (*continued*)

Add a new Codec by known IP address

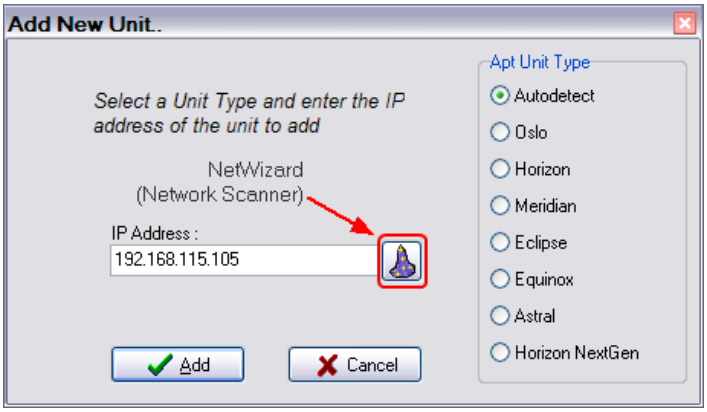

Figure 2-6: Shows how to add a Codec with a known IP address to the Main Screen

If you opt for "AutoDetect" (Radio Button) and the NMS is not able to connect to the desired Codec then you will receive the following messages:

Message: Warning

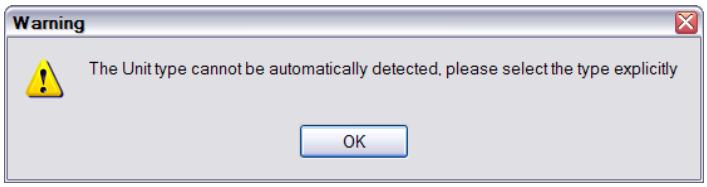

Figure 2-7: If adding a Codec by known IP address with "AutoDetect" selected fails, you will receive this warning

Message: Warning

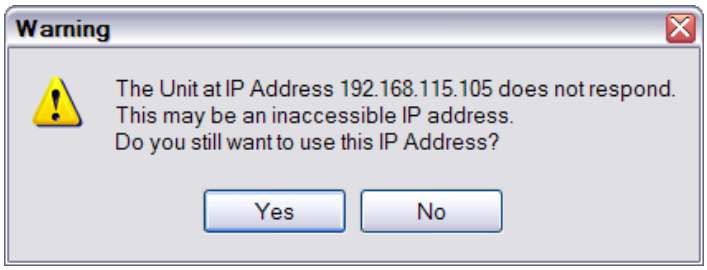

Figure 2-8: If adding a Codec by known IP address with "unit type" selected fails again, you will receive this message

If you still wish to use the chosen IP address click on "Yes". The NMS will show this unit as unreachable on the Main Page (refer to the screen shots on the next pages).

2.7.2 Deleting a Codec device from the Main Screen

The second button on the Tool Bar is for deleting a Codec from the main screen. Select the particular device and click "Delete Unit" on the Main Tool Bar or hit "Del" on your keyboard. A warning window will prompt you for final confirmation.

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2.7.3 The Net Wizard

The third button starts the Net Wizard, which scans a user defined IP address range in order to auto-detect any reachable WorldNet/WorldCast Codecs on the network. Click on "Net Wizard" to start the network scan. Run the Net Wizard for the auto-detection of any Codec on the network.

The Net Wizard provides automatic detection of each device connected to the network by its corresponding IP address. The Net Wizard scans an IP address range and reports the detected unit. You may choose whether to add all or a selection of the detected frames to the Main Screen. Click on "Net Wizard" and follow the Wizard's instructions.

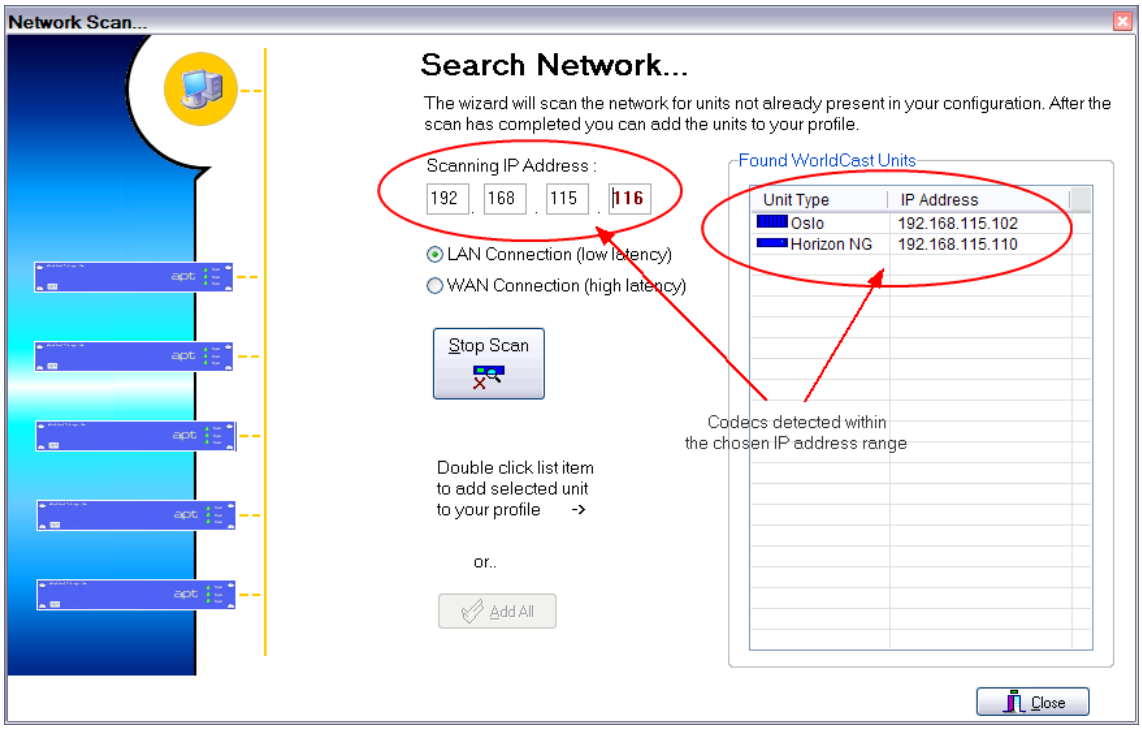

Figure 2-9: Shows results from a network scan of range IP: 192.168.115.1 onwards. The scan was stopped manually at xxx.xxx.xxx.116 (no further units expected).

Begin by entering an IP address you wish to start searching from; then click on "Begin Scan". The Net Wizard will scan all IP addresses from the one entered, ending when the last number in the search address reaches 255. You can stop the search at any stage by clicking on "Stop Scan".

Whenever the Net Wizard finds Codec devices it will display them in a list on the right hand side of the screen.

To add a unit to the family tree, double click on the chosen entry in the list or to add all of them click on "Add All".

If the Net Wizard has not found any connected units, you should double check the network settings on the Net Wizard. The Wizard scans the IP address range from the IP address you enter incrementing the last number until it reaches 255.

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The Net Wizard (*continued*)

For the PC to be able to address the audio Codecs, its IP address must be in the same subnet as the Codecs. If you are using the DHCP service for dynamic assigned IP addresses on your PC check that the assigned address is in the same subnet as the Codecs. If not then you must disable DHCP and assign an IP address manually which is in the correct range.

ⓘ *Once the audio Codec has successfully connected to the NMS application, you can also change the unit's IP address to the required value of your network using the NMS.*

ⓘ *You must first establish the network connection in order to access the Codec's configuration menus.*

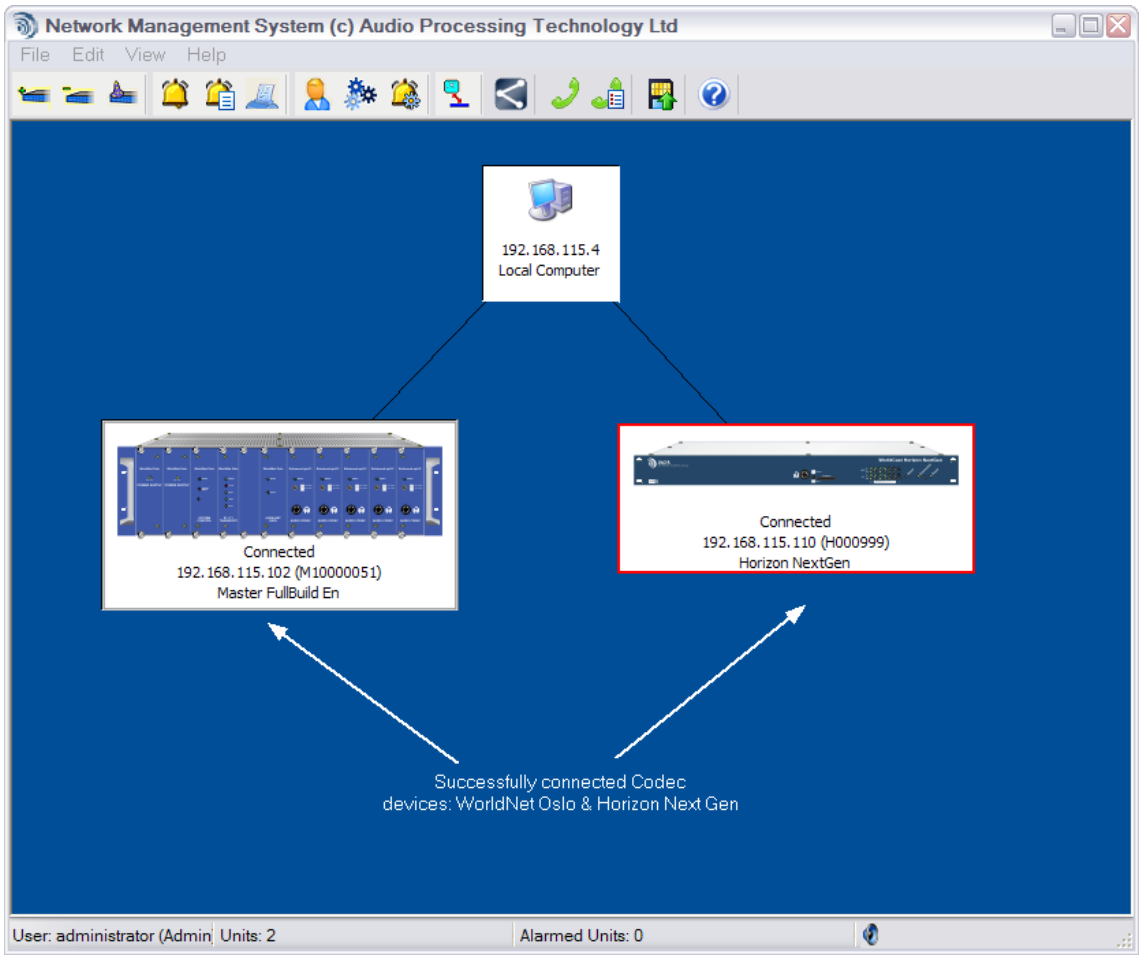

Figure 2-10: This example shows one WorldNet Oslo frame and one Horizon NextGen Codec successfully added to the Family Tree.

***Note:** The IP address of the frame as well as the serial number and name of the frame (if configured) are displayed. If the NMS cannot connect to a particular Codec it will show the serial number as unreachable (disconnected) and add the flashing "⊘" graphic.*

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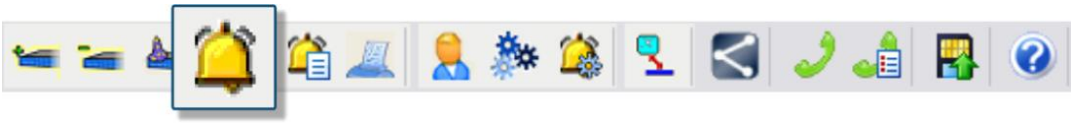
2.7.4 Reset the Codec Hardware IP Address

In the case that you cannot detect the required Codec device on your network, neither by entering the IP address manually or by running the Net Wizard, you should reset the unit in order to force the hardware default IP address. This is done by pressing the reset button on the hardware front panel. Refer to section 3.1.2.3 of this manual about how to initiate the reset. After you have reset the Codec and the Net Wizard has successfully connected it to the NMS, you can then set the IP address to the required value of your network.

The Silver Stream-In/Stream-Out hardware default IP address: ***192.168.100.110***

2.7.5 Current Alarms



Clicking on the "Current Alarms" button opens a separate window showing the currently flagged alarms of all connected codec frames. This alarm window presents the alarms status in real time.

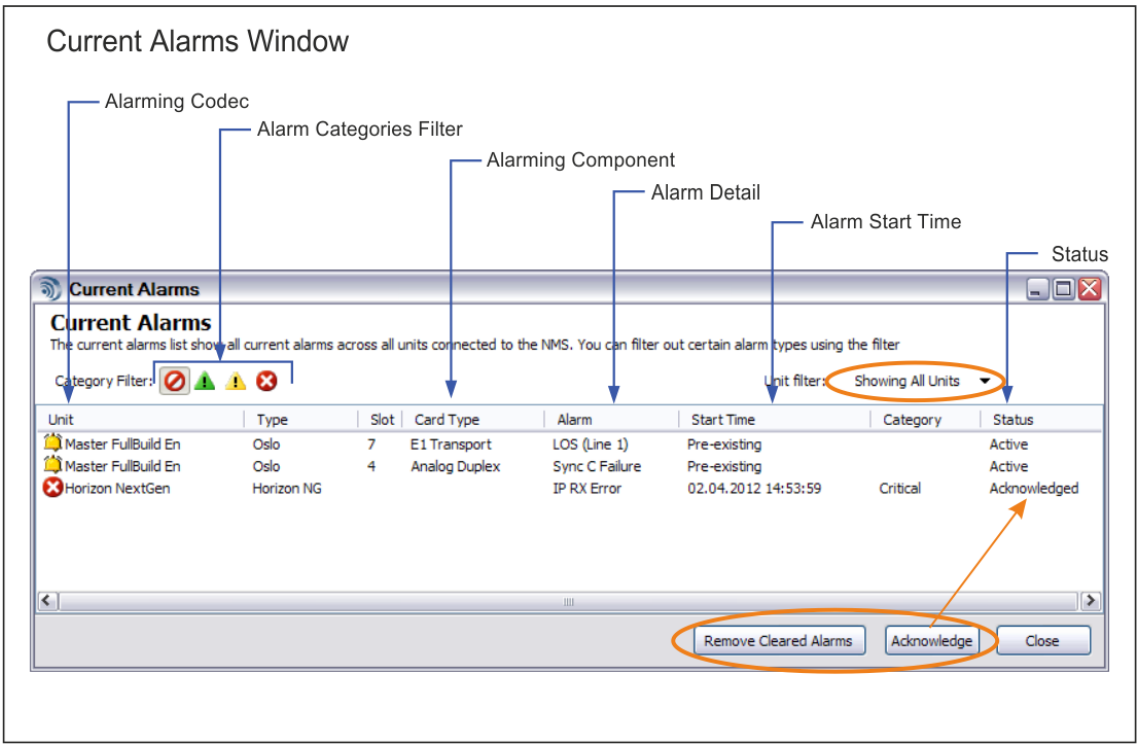


Figure 2-11: Shows the Current Alarms Window

The Current Alarms Window is a non-modal Window (independent from the main screen) and can be moved independently on the PC screen (or to a second monitor).

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Current Alarms *(continued)*

- **Alarming Codec (Unit)**

  This column shows the currently alarming Codec devices

- **Alarm Categories Filter**

  These filter settings allow filtering the visible Alarms on a unit

  - No Filter (all Alarms)
  - Minor Alarms only (green)
  - Major Alarms only (yellow)
  - Critical Alsarm only (red)

- **Alarming Component**

  This column shows the alarming module on a modular Codec like the WorldNet Oslo (not relevant for the Silver Codecs)

- **Alarm Detail**

  This column shows the alarm type and details

- **Alarm Start Time**

  This column shows when the alarm occurred or if it was pre-existing (prior the logIn time)

- **Alarm Category**

  This column shows the Alarm Categories: Critical, Major or Minor

- **Alarm Status**

  This column shows the current alarm status: Active or Acknowledged

- **Acknowledged Button**

  Selecting an alarm and then clicking on “Acknowledged” sets the status from “Active” to “Acknowledged”. When a new alarm occurs a sound file can be played from any location in the network (if configured). After acknowledging an alarm this file is stopped.

- **Remove Cleared Alarms**

  Clicking on this button deletes all “Cleared Alarms” marked in the table.

- **Unit Filter**

  Clicking on “Unit Filter” opens a drop down menu allowing selecting the units displayed in the table. The image above is set to “Showing All Units”, hence all units currently connected to the NMS can be shown in the “Current Alarms Table” (when alarming).

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2.7.6 The NMS User Management

Clicking on the "Users" button opens the User Management Window which provides the option of adding new users or deleting existing user accounts for the NMS (not for a particular Codec).

It is important to know that all NextGen Codec Devices (Silver Codecs, Horizon, IP Decoder etc.) are currently supported by an embedded WEB browser window on the NMS application. This has effect on several NMS functions and to the NMS user management in particular.

To add a new user select "Add new user." Enter the new user details in the dialog box provided. Decide which type of access this new user should have, and select the appropriate user level. Select "Save Changes" to add the new user to the account list.

To remove an account, highlight the user account on the list of available users and select "Remove existing user." Selecting "Save changes" stores all changes and closes the Users dialog window.

If you want to modify an already existing account, you must first delete this account and then add it again with your modifications.

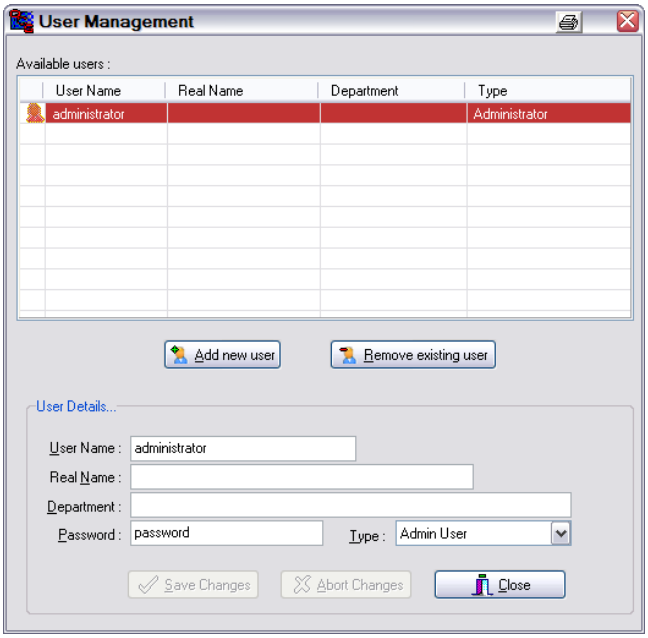

Figure 2-12: The NMS User Management window allows you to add or delete user accounts

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The NMS User Management (continued)

All NextGen Codec devices have their own user management on the embedded WEB GUI. The NMS access limitation has effect on the NMS controls and the WorldNet Oslo frames only! In consequence a NMS Guest account may have the full access to a Silver Codec if logged in as Silver Codec Administrator.

- **NMS - Administrator:**

  Administrator allows full access to all features and controls of the Management System. This includes the full control of WorldNet Oslo frames.

- **NMS - Normal:**

  Allows viewing access to the settings and logs and allows you to set up and clear down IP connections (on the WorldNet Oslo frames).

- **NMS - Read Only:**

  This is very limited "Read Only" access that allows reading active connections only. Logging into a NextGen Codec is managed by the WEG GUI user management system.

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2.7.7 NMS Settings – General Options

Clicking on the "Settings" button opens the configuration folder which provides a set of basic configuration tabs. These configurations are related to both the appearance of various NMS screens and the Auto Update interval which pulls the Log File information from the connected hardware. For the NextGen codecs not all of the setting options are relevant.

The "General Options" are related to the NMS appearance and controls:

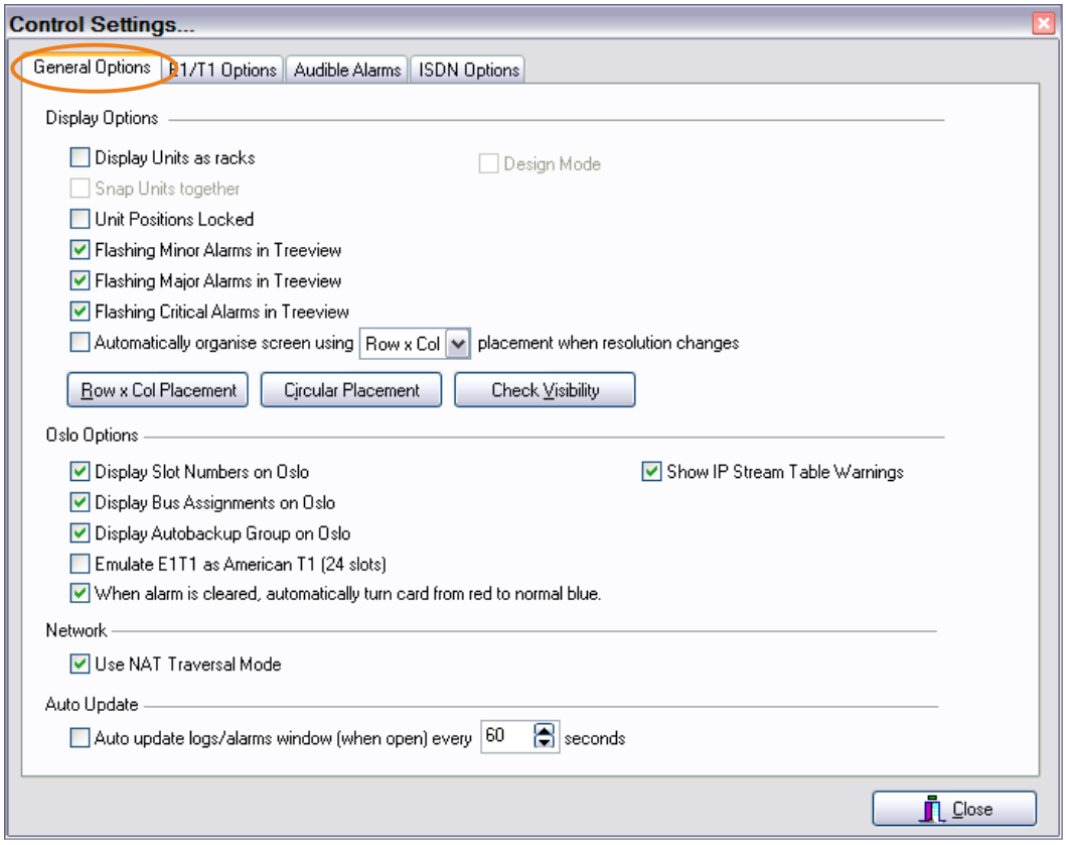

Figure 2-13: Shows the General Options page in the NMS settings folder

- **Display Units as racks**

  Checking Display Units as racks will decrease the image size of the units assigned to the Family Tree (the main screen). This is a useful option if there are many units connected to the network and placed on the Family Tree.

- **Unit Positions Locked**

  Enabling this check box will lock the icon positions on the family tree. It inhibits moving the unit icons unintended or accidently.

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NMS Settings – General Options *(continued)*

- **Flashing Alarms in Tree View**

  These three check boxes control the appearance of the alarms indication on the family tree unit icon. When enabling the check boxes (Minor, Major or Critical) the corresponding "Alarm" indication flashes.

- **Automatically organize Screen using "selected" Placement when resolution changes**

  Enabling this check box will automatically force the NMS to reposition the unit icons on the family tree in the selected way if the screen resolution has changed. This is either a row and column structure or a circular placement

- **Row x Col Placement**

  Clicking on this button will force the NMS to reposition the unit icons on the family tree in a row and column structure.

- **Circular Placement**

  Clicking on this button will force the NMS to reposition the unit icons on the family tree in a circular structure.

- **Check Visibility**

  Clicking on this button will force the NMS to check if all unit icons are visible on the screen after the resolution has changed.

- **Oslo Options**

  These options are not relevant for the Silver Codecs.

- **Use NAT Traversal Mode**

  NAT Traversal Mode is required if the service PC running the NMS is sitting behind a NAT traversal router. Checking this box forces the NMS communication to use the same IP ports for sending and receiving packets through the router (Tx port = Rx port). In almost all cased the NAT traversal router allows receiving traffic that is assigned to the same IP port as the outgoing IP packets.

- **Auto Update Log/Alarms Window…**

  Not relevant for the Silver Codecs.

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2.7.8 NMS Settings – Audible Alarms

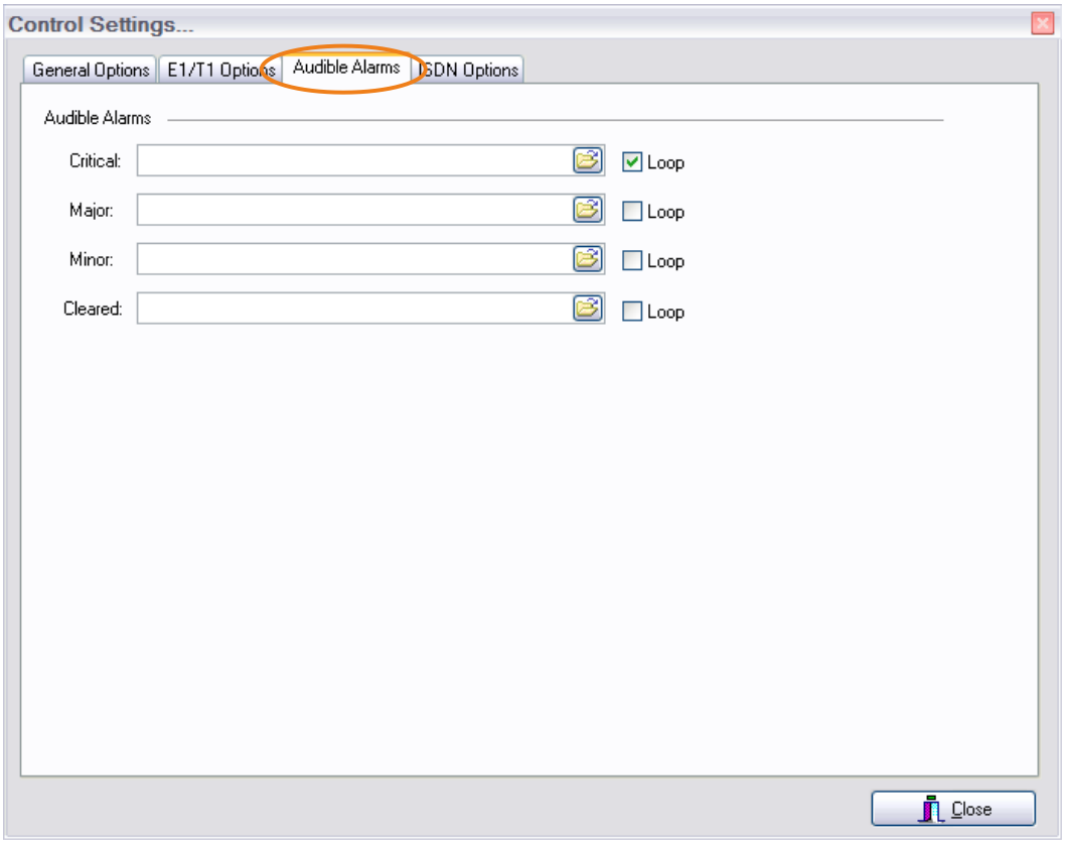

Figure 2-14: Shows the configuration options for audible alarms

This configuration allows to making alarm categories audible when occurring. Clicking on the file browser button opens the file manager. Navigate to the desired sound file (MP3 or WAV) and assign the file to the category. Enabling the "Loop" option forces the NMS to loop the clip.

The loop mode plays the file as long as the alarm is active or the user acknowledges the alarm as described in the "Current Alarms Window" section.

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2.7.9 Family Tree View

Clicking on the "Tree" button causes the NMS to close (and logout) the currently open Codec page and switches to the Family Tree view – or from the Family Tree view back to configuring the last open Codec. On the NextGen Codecs this operation forces a logout from the WEG GUI as well.

Notes:

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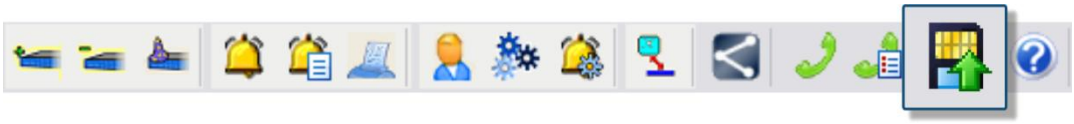
2.7.10 Firmware Update Manager



Clicking on the "NMS Firmware Update Manager" button allows you to manage the firmware update of one or more Codec units in a centralized way. The Firmware Update Manager is comparing the firmware currently installed in each Codec device of the Tree view to the firmware package that you have selected for the update. The following description shows the procedure on a Horizon NextGen, but it is the same for all APT Codecs.

Clicking on the Firmware Update Manager button opens the following window:

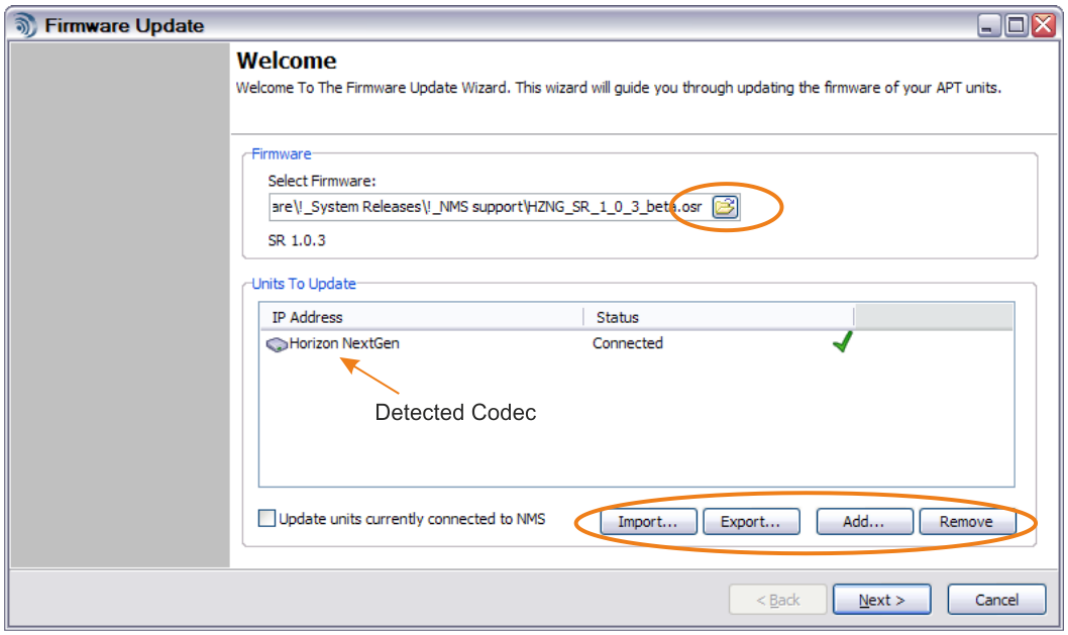


Figure 2-15: Shows the Firmware Update Manager Window (this example shows a Horizon NextGen)

The Firmware Update Manger detects all currently connected units from the NMS family tree. Clicking on an individual unit selects it and allows removing it from the list (by clicking on "Remove"). "Add" a unit opens an entry field for entering an IP address of non-detected devices. "Import" and "Export" allows loading or saving the list of Codecs for firmware updating.

ⓘ *Each type of Codec has its own firmware file container (the .osr file) clearly labeled, e.g. SLVR_SR_xxx for Silver Stream-In/Stream-Out. The firmware Update Manager processes one firmware container at once; hence all Codecs that are not from the selected type should be removed from the list (e.g., Oslo frames and Horizon NextGen or IP-Decoder).*

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Firmware Update Procedure

After the Update Manager has detected the all Codecs, the list must be cleared as described above; only the Silver Codecs should be listed. Before the update procedure can start, the firmware file container must be selected.

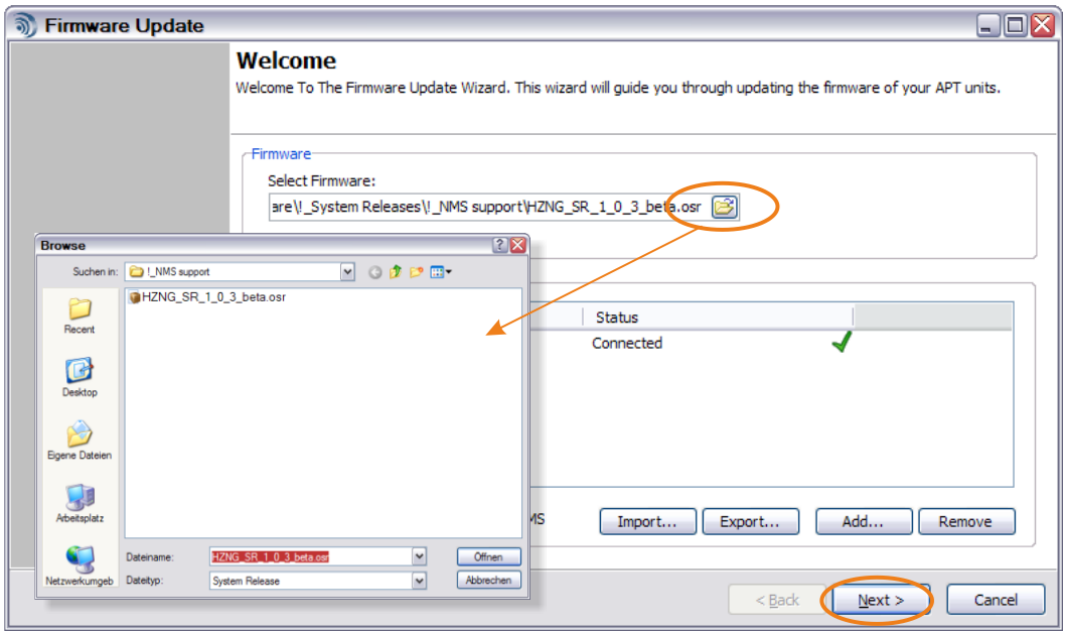

Figure 2-16: Shows the file manager for selecting the desired .osr container (this example shows a Horizon NextGen)

Clicking on the file manger icon opens the file manager and allows navigating to the location on the hard drive where the firmware was stored.

Once the firmware was selected, press "Next" to start the firmware scanning.

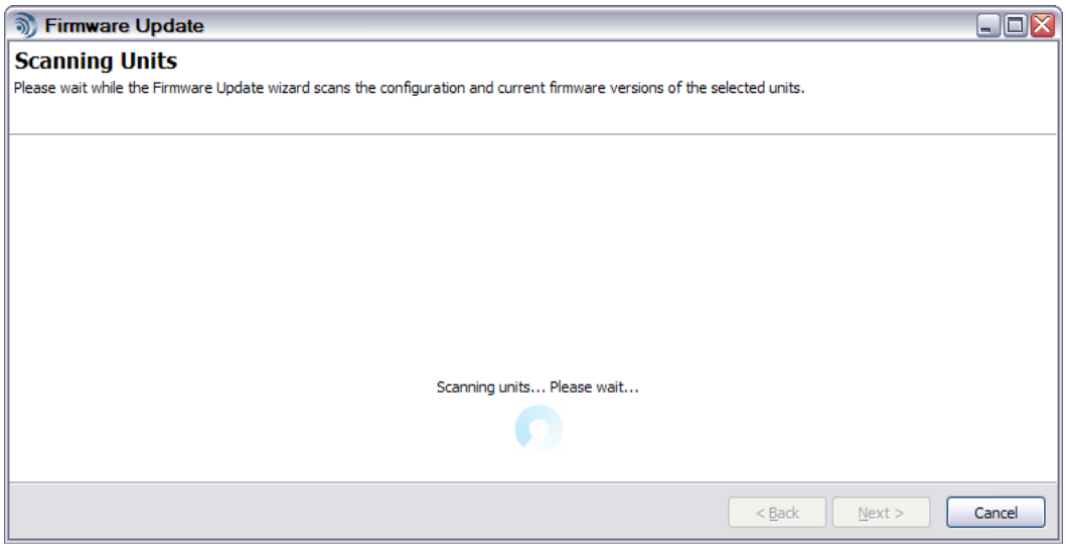

Figure 2-17: Shows the firmware scanning process

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Firmware Update Procedure *(continued)*

The firmware Update Manager scans each selected unit and analyses the currently running firmware; it compares these system release versions with the firmware container that was selected for the update and presents the results:

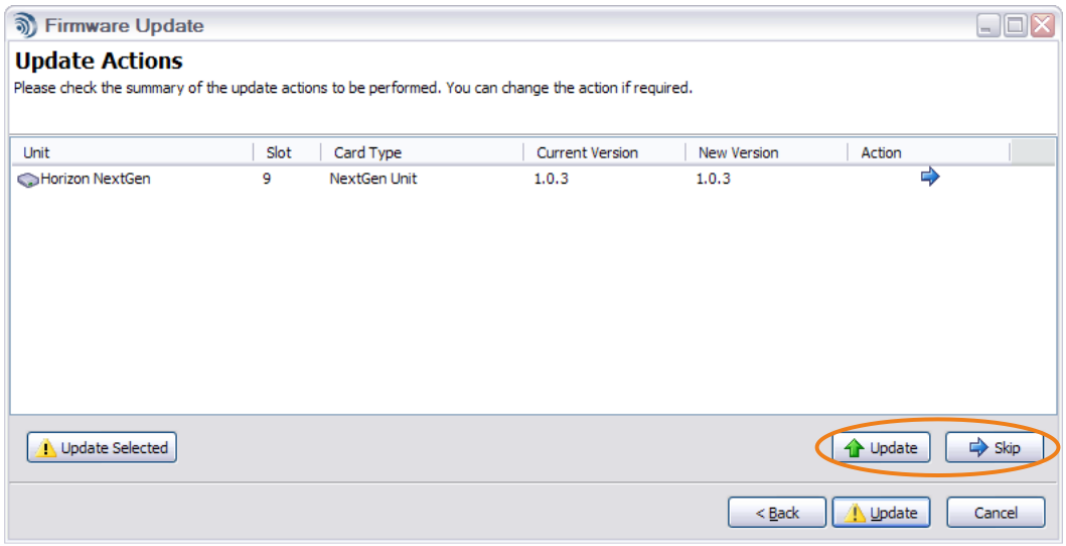

Figure 2-18: Presents the firmware scanning results (this example shows a Horizon NextGen)

The figure above shows the unit type, the current version of firmware and the new version. In this example both, the current and the new version are the same. The blue arrow on the "Action" row indicates that an update is not necessary. However, you may make different options by selecting a card and clicking on one of the following buttons:

- Skip

  "Skip" leaves the firmware unchanged for the selected unit. In case that the firmware scan result shows the green update arrow clicking on "Skip" will inhibit an update.

- Update

  "Update" forces the update to the version contained in the .osr file for the selected unit, regardless of the scan result. The Firmware Update Manager will ask for your confirmation in case you attempt to downgrade a Codec (current release is newer than the release contained in the .osr file).

- Update

  Clicking on this "Update" button starts the update process. The firmware will be loaded to the Codec unit(s) simultaneously. The Update Manager will process and monitor the updates. The process always starts first by uploading all necessary firmware to each Codec concerned. This operation is reported as "Upload" in the Action column (see image on next page).

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Firmware Update Procedure *(continued)*

The screen shot examples below show a Horizon NextGen, but the procedure is the same on all APT Codec devices.

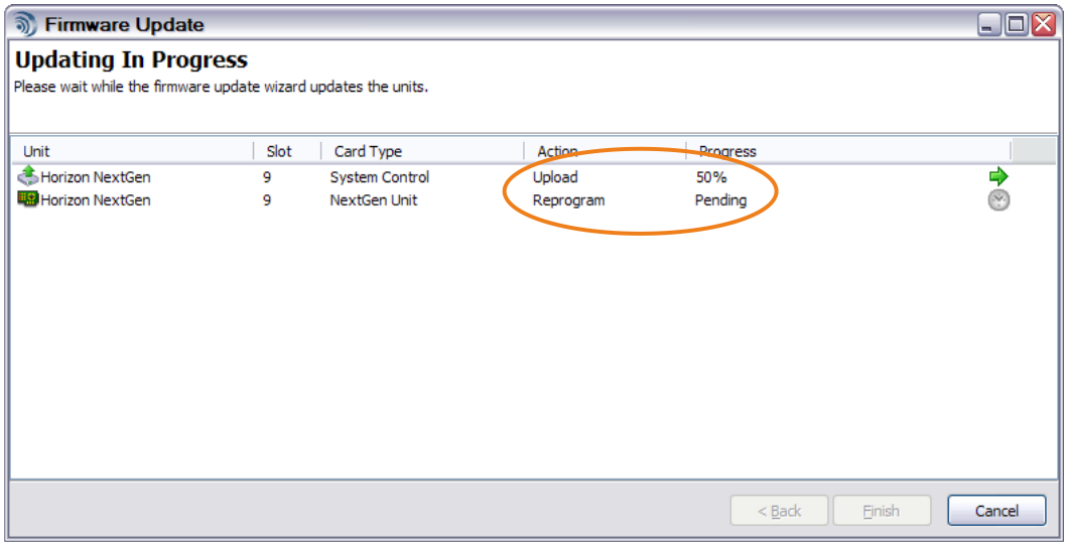

Figure 2-19: Shows the firmware upload process

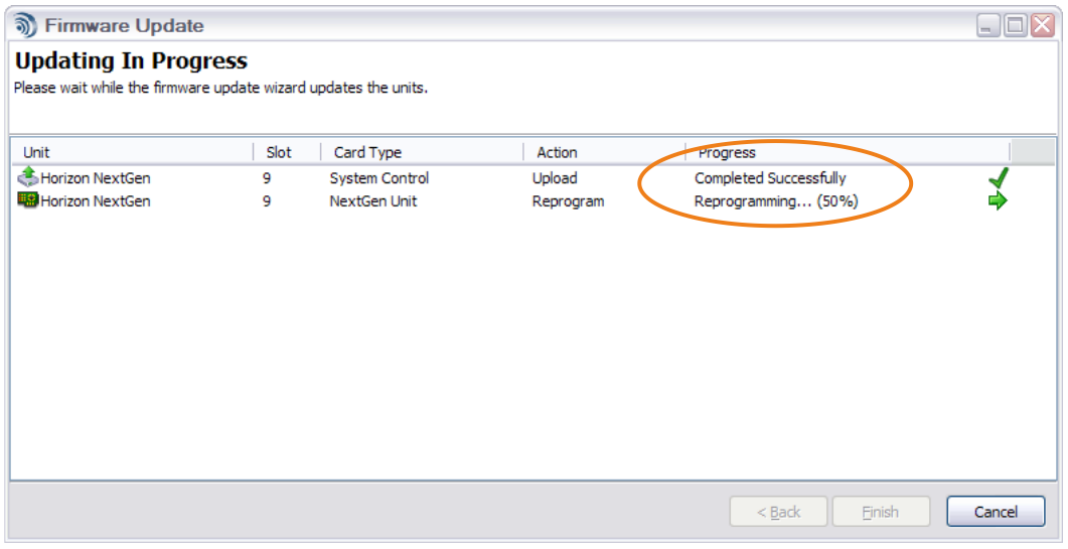

Figure 2-20: Shows "Upload completed" and "Reprogramming processing"

After the reprogramming is completed the Update Manager reboots the Codecs and prompts you to close the Manager by clicking on "Finish".

***Note**: In case one firmware upload has not been completed, there has probably been an ftp connection issue between the unit and the NMS. In this case, click Cancel and restart the firmware Update Manager.*

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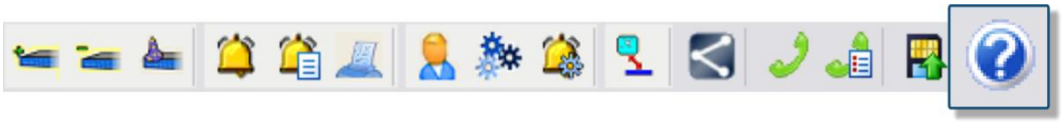
2.7.11 About the NMS



Clicking on the "About" button displays the version number of the NMS and gives access to the data files location by clicking on the related button.

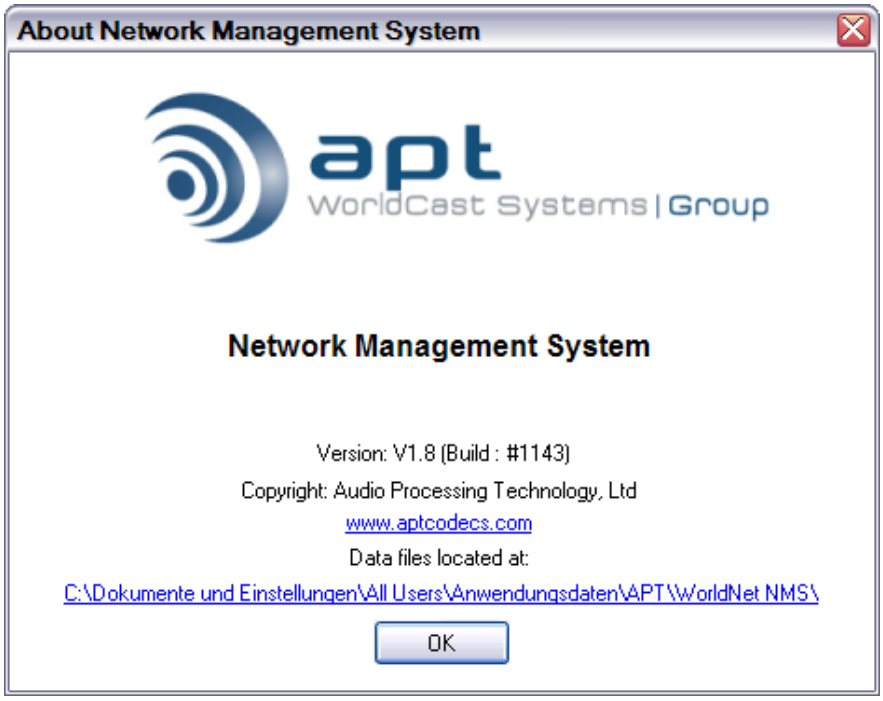


Figure 2-21: Shows the "About" box with NMS version number and the link to access data files location

This is where are stored the configuration options of the NMS and other application data files.

Note: *The NMS data files are shared by all versions of the NMS installed on the computer for Windows® Vista & Windows® 7 compatibility reasons.*

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2.8 Codecs and Switches

Codecs react in a similar way to all network devices and therefore should not be flooded with background non-related network traffic.

The best way to limit traffic is to have a switch (not a hub, or a switch that acts like a hub) communicating with the unit similar to the diagram below.

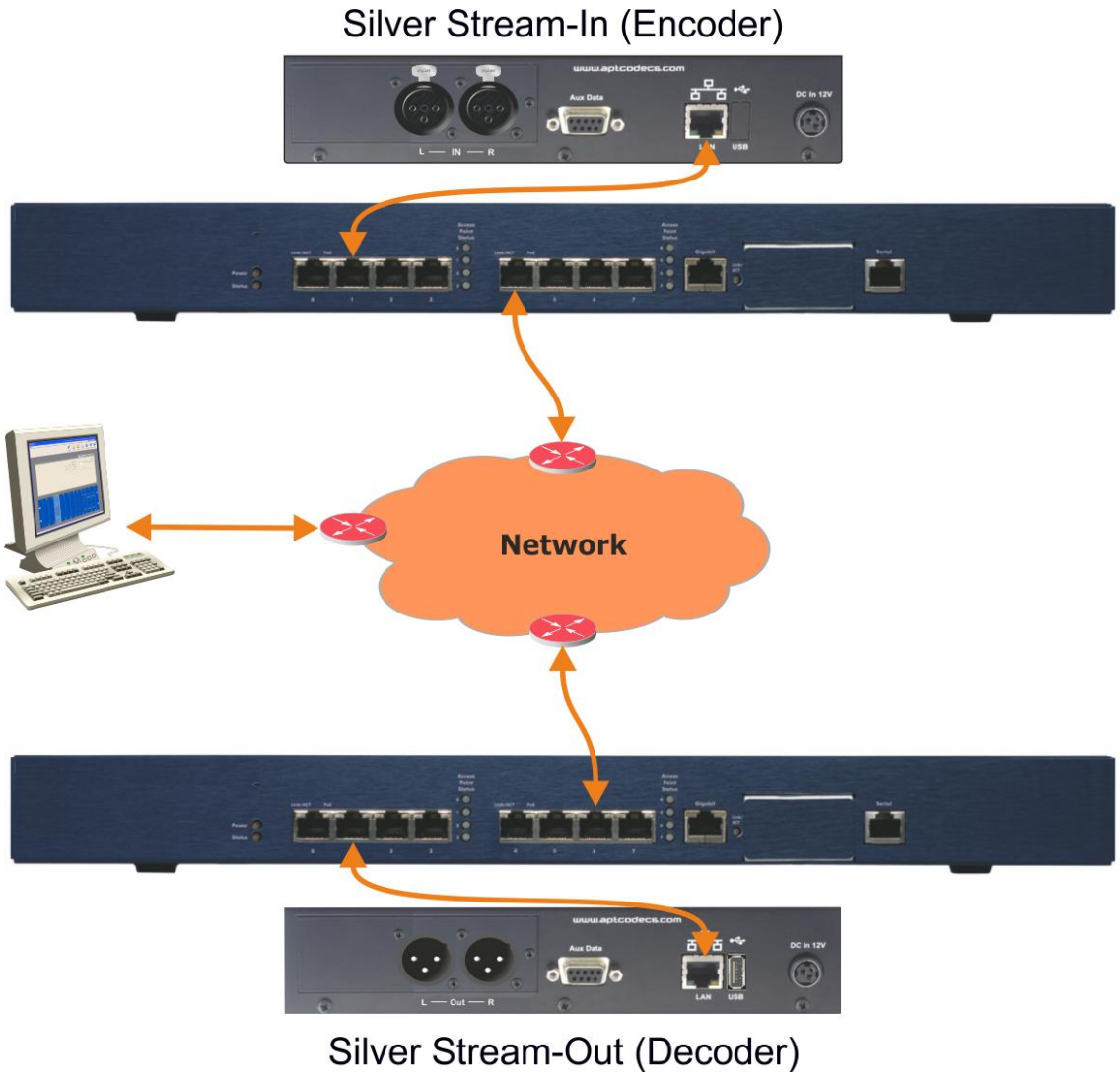

Figure 2-22: This figure shows the recommended network installation: Audio Codec connected to a Switch

It is recommended that the port settings on the switch are set to auto negotiate.

Default IP address for the ETH: ***192.168.100.110 –*** *DHCP disabled on default.*

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3.0 Installation and Wiring

This chapter describes the general installation procedure and the wiring of the Silver unit's rear panel connectors. This section consists of two parts:

- Preparing for installation of the Silver Stream-In/Stream-Out
- Wiring power and signal connectors

3.1 Pre-Installation Notes

Always pre-test the system on the bench in its intended configuration prior to installation at a remote site.

Avoid cable interconnection length in excess of 1 meter (3.3 feet) in strong RF environments (i.e. on transmitter sites).

3.1.1 Tools and Cables Required

In addition to the content of the packing list, the following items are necessary to complete the installation.

- **Network/Management connection cables**

  One CAT5 Ethernet cable to connect the Silver to a switch.

  One CAT5 Ethernet cable to connect the PC to the switch

  One CAT5 Ethernet cable to connect the switch to the network

- **Ethernet hub or switch:**

  Providing an Ethernet switch facilitate the audio IP link and the management connection simultaneously (refer to figure 2-4)

- **Cables for each payload channel:**

  At least one standard audio cable equipped with RCA or XLR connectors (depends on the version of Silver unit)

- **Power Adapter:**

  AC power adapter as supplied with the Silver unit

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3.1.2 Front panel Components

Figure 3-1: Silver Stream-In/Stream-Out front panel components

3.1.2.1 Monitoring

(1) The 6.3mm jack socket is provided for audio monitoring with a headset or active monitor speaker. Depending on the type of Silver unit it is either the audio input (Stream-In) or the audio output (Stream-Out). This monitor output has a fixed signal level and is not adjustable.

3.1.2.2 Power- Connection - and Alarm Status

(2) The blue Power indicator LED indicates that power is applied to the unit

The red Alarm indicator LED indicates that an alarm condition exists. There are a number of alarm conditions which can be enabled on the Silver range.

The "Connected" LED shows the presence of a connection. The following table shows the different states of the LED.

Connected LED Color:	**Off/Grey**	**Green**	**Red**
No Stream enabled	**X**		
Receiving & Transmitting ok		**X**	
Connection Error			**X**

3.1.2.3 Reset Switch – Default IP Addresses

(2) Between the "Connected" and the "Power" LED there is a small hole in the front panel. Behind this hole sits the IP Address Reset Switch. To change the IP Address of the Silver units to the default addresses, insert a small tool until and press the switch. Hold it in place until the Connected LEDs start to flash (about 5 seconds) – then remove it.

The unit will then have changed IP address; it does not need to reboot. It will take a short while (~10sec) until the Web GUI will be accessible again on the default addresses.

ⓘ *The default IP address of the ETH is:* ***192.168.100.110***

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3.2 Wiring Information

Stream-In/XLR

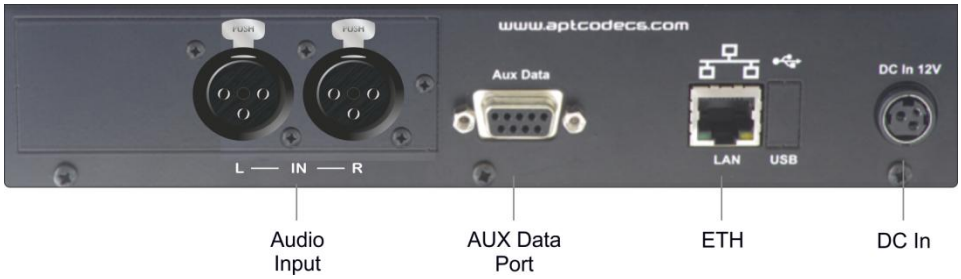

Figure 3-2: Silver Stream-In rear panel components

Stream-Out/XLR

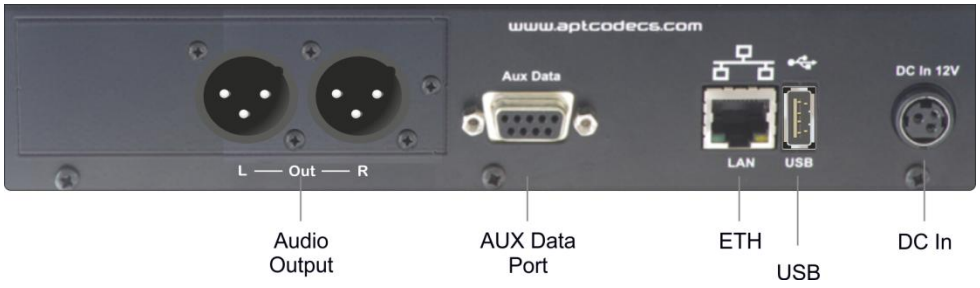

Figure 3-3: Silver Stream-Out rear panel components

3.2.1 Power Adaptor – DC In

The Silver units are supplied with an external Mains power adaptor suitable to work between 100 VAC and 240 VAC. This power adaptor applies 12 VDC to the unit and has a self-locking connector.

ⓘ *Do not use another type of AC adaptor than supplied with the unit*

3.2.2 Ethernet Interface

This is a 10/100BaseT Ethernet connection with Auto MDI/MDI-X capability on a RJ45 connector.

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3.2.3 Audio Inputs and Outputs on XLR version

The audio inputs on the XLR version accept up to +24 dBu (clip level)

The audio outputs on the XLR version deliver up to +24 dBu (clip level)

Standard XLR-3 female socket

Audio Input (analog)

Pin	Description
1	screen
2	hot (+ve)
3	cold (-ve)

Analog input levels can be adjusted via the Web GUI in increments of 0.1 dBu. The input impedance is selectable between 600 Ω and >10 kΩ via the Web GUI.

Standard XLR-3 male socket

Audio Output (analog)

Pin	Description
1	Screen
2	hot (+ve)
3	cold (-ve)

Analog output levels via the Web GUI in increments of 0.1 dBu. The output impedance is selectable between 600 Ω and 50 Ω via the Web GUI.

3.2.4 Audio Inputs and Outputs on RCA version

The audio inputs on the RCA version accept up to +10 dBu (clip level). The input clip level (internally referenced to digital full scale) can be adjusted in increments of 0.1 dBu from 0 dBu to +10 dBu.

The audio outputs on the RCA version deliver up to +10 dBu (clip level). The output clip level (internally referenced to digital full scale) can be adjusted in increments of 0.1 dBu from 0 dBu to +10 dBu.

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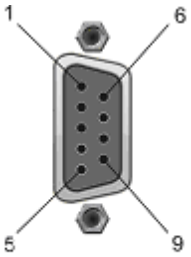
3.2.5 Auxiliary Data Interface



9 pin female connector
contact view

This is a SELV connection and must only be connected to other SELV ports.

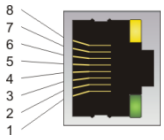
RS-232 (DTE) Serial Inputs

Pin	Signal	Description
1	N-C	N.C.
2	Rx	RS-232 Receive
3	Tx	RS-232 Transmit
4	DTR	N.C.
5	GND	Ground
6	N-C	N.C.
7	N-C	N.C
8	N-C	N.C.
9	N-C	N.C

The RS232 auxiliary data channel of the Silver units offer continuous data transfer rates from 1.200 to 115.200 Baud (non-embedded on AUX IP-Streams).

An AUX DATA connection on the Silver units can be configured for duplex operation (even that the audio is always simplex).

3.2.6 Ethernet Interface



10BaseT socket
wiring scheme

Ethernet Interface

Pin	Signal	Description
1	Tx +	transmit data +ve
2	Tx -	transmit data -ve
3	Rx -	receive data -ve
4	N-C	Not connected
5	N-C	Not connected
6	Rx +	Receive data +ve

This Ethernet interface is available for both connecting to a PC running the WorldCast NMS (or WEB browser) and for sending and receiving audio data.

This ETH port is auto MDI/X enabled. An **Auto-MDI/X** port detects if the connection would require a crossover link, and automatically chooses the MDI or MDIX configuration to match the other end of the link properly.

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4.0 WorldCast/Silver WEB-Browser GUI

The WorldCast/Silver Web GUI is the control and monitoring tool which communicates with the Silver units. All the next generation units, including the Silver range, run their own Web-server with can connect to standard Web Browsers or to the APT NMS. It is used to configure the unit, create audio streams and to get status and alarm information.

This section outlines this application and provides a detailed description of all aspects of the Silver configuration options.

4.1 The WorldCast WEB GUI - Overview

The Silver Web GUI allows you to view and control a single instance of the Silver IP-Streamer. The application has an intuitive look and feel that is easy to understand by both the experienced technician and the casual user. All configuration instructions described in this section relate to the WEB GUI. This section provides detailed step-by-step instructions on how to set up the Silver Stream-In/Stream-Out.

4.1.1 WEB GUI – Technical Requirements

The Web GUI can be run from a standard web browser such as:

- Mozilla Firefox (from v. 6.0)
- Internet Explorer (from IE7, IE8)
- Google Chrome
- Safari

Recommended screen/window size: min. 1280px by 1024px

The GUI is based on a web application using inherent browser technologies only: Java Script, Cookies and CSS (2.0). The application does not require installing any additional browser Add-In. The Cookies are session Cookies and used as temporary memory for configuration changes until they are uploaded to the hardware. A session Cookie expires after the actual session was closed.

4.1.2 Default Network Settings

The Silver units provide a single IP interface for IP audio streaming and web browser control.

The default settings for accessing the web server are (port #80):

ETH	IP Address	Netmask	Gateway
	192.168.100.110	255.255.255.0	192.168.100.1

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4.2 WEB GUI - Getting Started

Open the preferred web browser and type in the IP address of the Codec you like to configure, and you will be prompted with the LogIn screen.

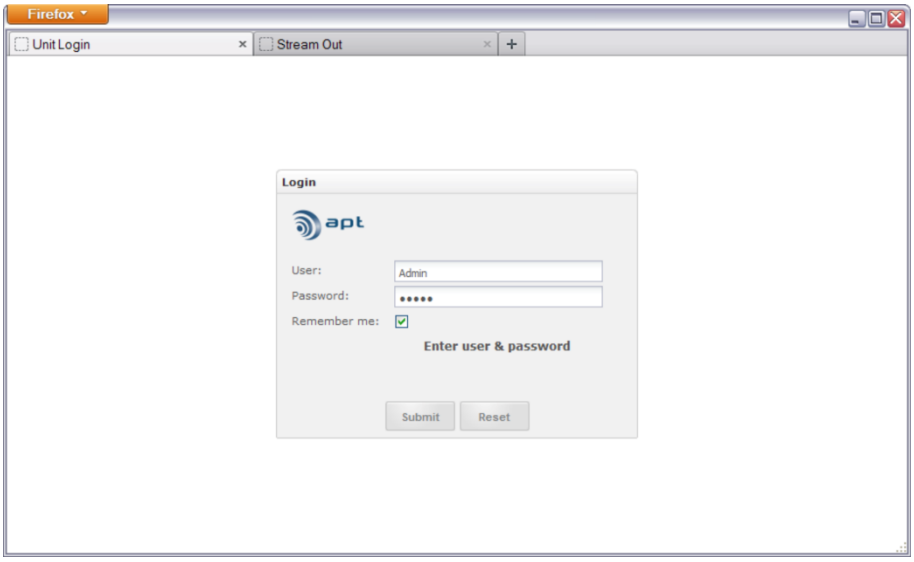

Figure 4-1: The WEB GUI LogIn screen

4.2.1 WEB GUI - Default LogIn

By default the Administrator account is selected. The user management allows modifying this account and it also allows setup a read-only account.

*Default LogIn, User: **A**dmin - Password: **a**dmin*

After you have submitted correctly the web browser starts loading the web application.

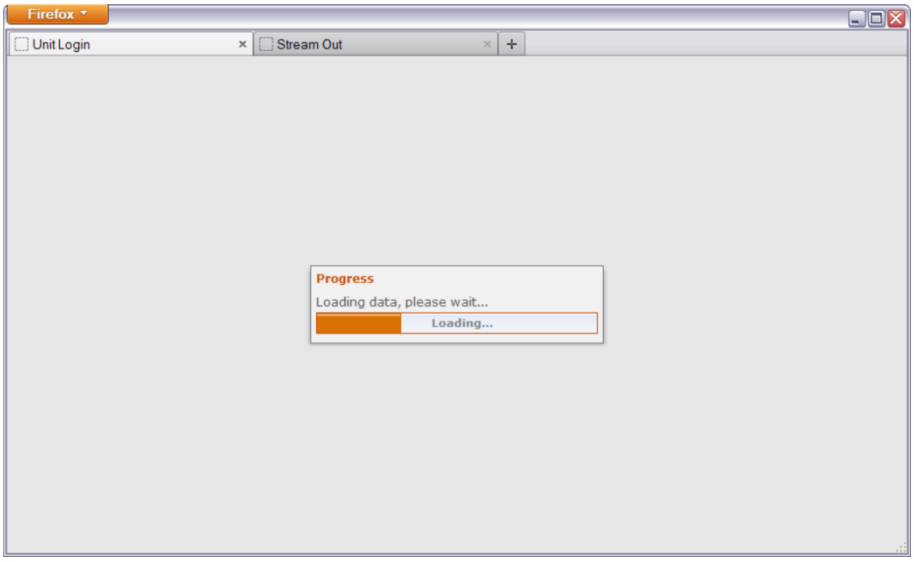

Figure 4-2: Loading application data – depending on your connection speed, this may take a short while

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4.3 WEB GUI – Home Page

Once the Web GUI has downloaded the application data from the Codec it will show the Status Page of the WEB application. The Status Page consists of three sections: The main menu (1) on the left hand side, the main pages (2) in the middle and the "Current Status" frame (3) on the right hand side which can be hidden and indicated by a colored bar (green, yellow or red in dependence of current alarm events).

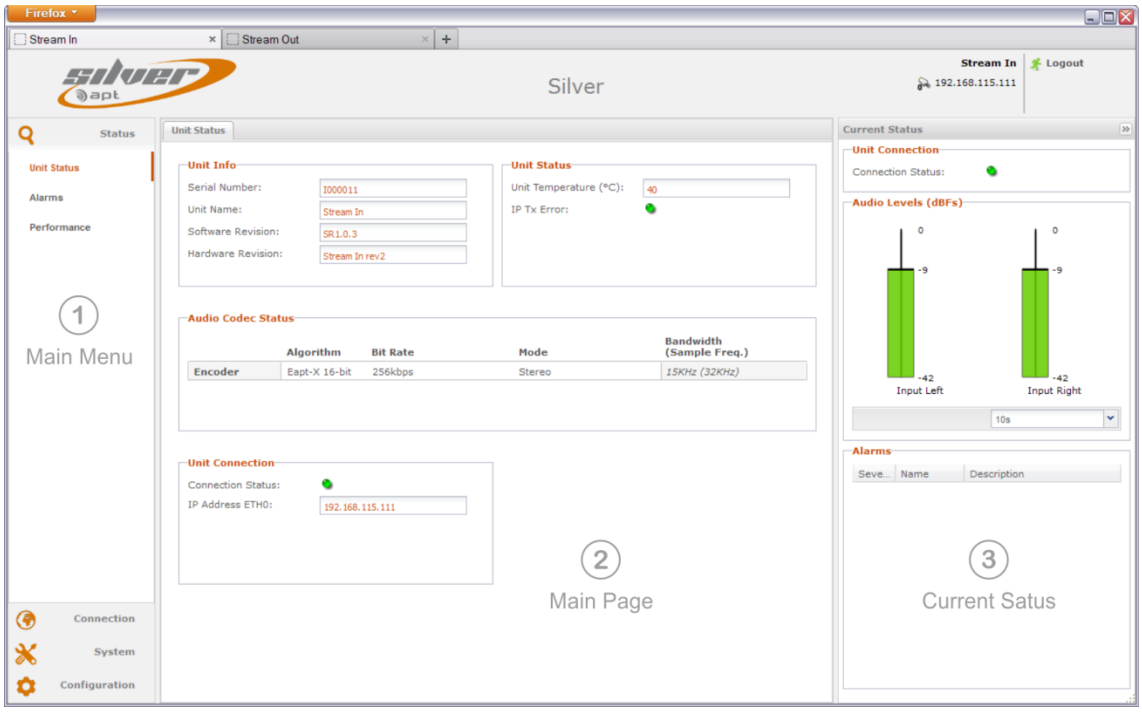

Figure 4-3: Shows the Unit Status page of a Stream-In unit with popped up "Current Status" frame

The default Main Page (2) is always the Unit Status page summarizing the status of the hardware unit, the current Audio Codec settings and the Connection Status. The color of the stylized LEDs indicates the current status condition (either green or red).

4.3.1 WEB GUI Session Close – Session Time Out

The WEB GUI allows connecting to a Silver unit in read/write mode only on one instance at once. While in "Read Only" mode many instances can monitor a single Codec simultaneously. Each time the browser connects to the hardware in read/write mode (Admin account) a new session will be opened. This session must be closed after a period of time in order to allow another seat connecting to the Codec in read/write mode. A timer ensures that a session cannot keep open accidently and closes the session after 60 minutes automatically, if no action takes place in this period of time.

A session can be closed manually by using the "Logout" button, closing the browser or the browser tab or by forcing a reloading of the application data by pressing the F5 key.

If the session has timed out or the session has been closed manually, a red "Session Locked" icon appears on the top right corner of the browser window.

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4.4 WEB GUI – Main Menu

The main menu is always present on the left hand side of the browser window. In dependence of the selected menu item it will expand and show related submenu items.

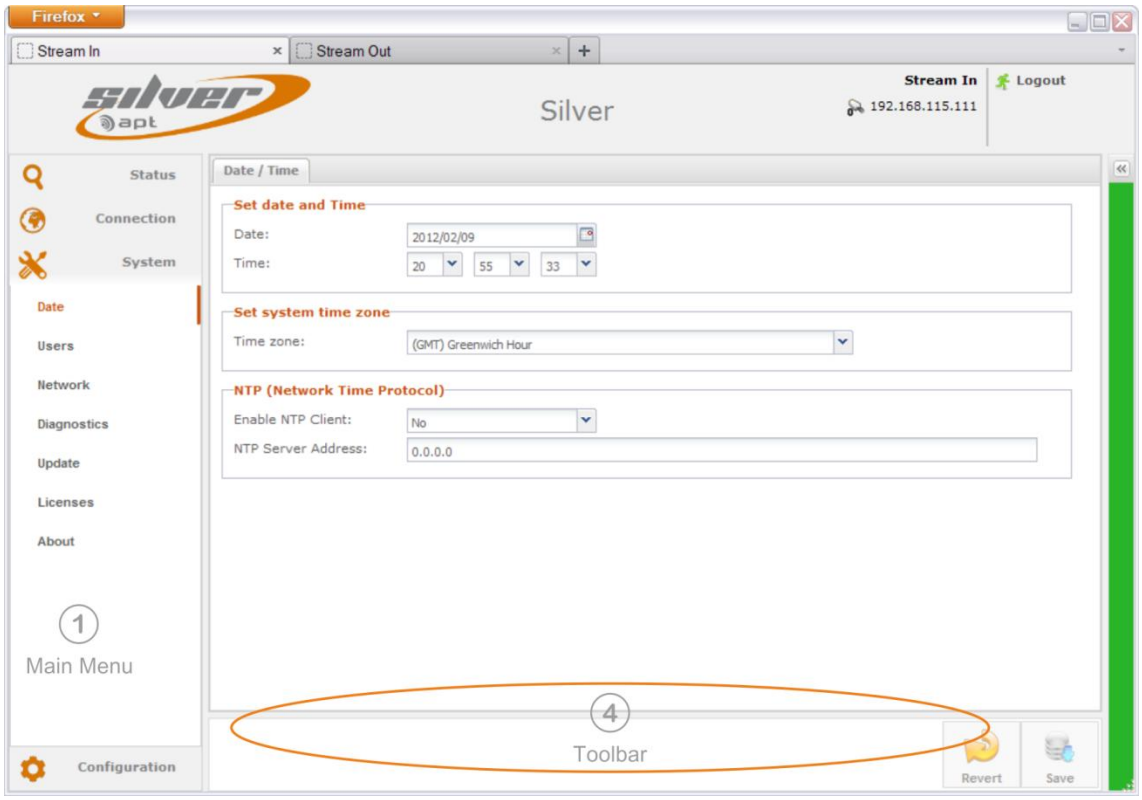

Figure 4-4: The Main Menu expands in dependence of the selected menu item. The "Current Status" frame is hidden and indicated by the green bar.

The screen shot above shows the expanded main menu (1) with related sub menu entries of the current main page. This figure also displays the hidden "Current Status" frame. This frame is indicated by the currently green color. Clicking on this colored bar pops up this frame.

Following the selected menu entry and the current main page the WEB GUI opens the tool bar (4) on the bottom of the browser window providing corresponding toolbar items.

ⓘ *The "Current Status" bar changes its color in dependence of the current conditions. Possible colors are: GREEN (no error), Yellow (minor error) and RED (major error).*

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4.4.1 Current Status Frame

This "Current Status" frame allows a quick inspection of the current condition of a running configuration. Clicking on the little arrows on top of the bar opens it as browser frame. In this mode it is re-sizable and parameters can be changed (e.g. refreshment cycles). Clicking on the colored bar opens this window as popup window with a fixed size and in read-only mode.

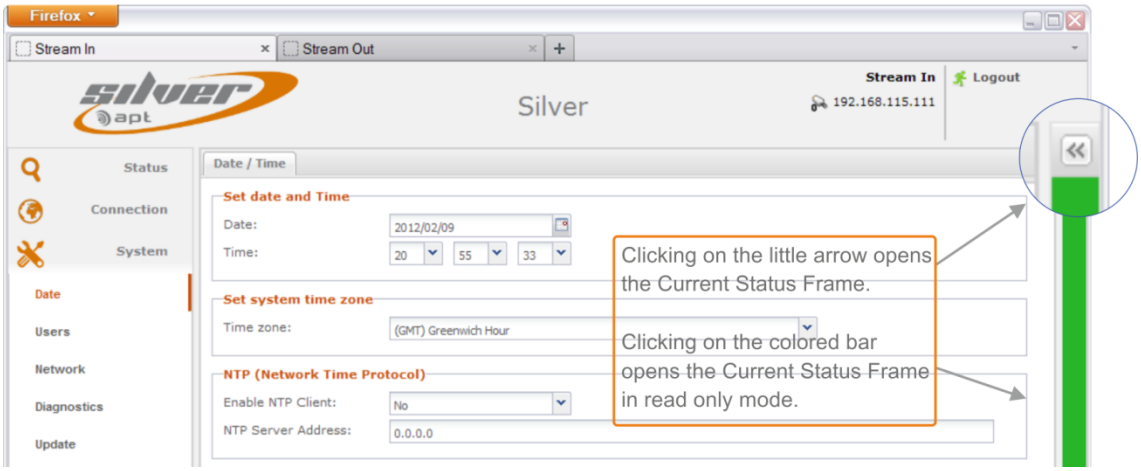

Figure 4-5: Two methods to open the "Current Status" frame; re-sizable or in read-only mode.

The "Current Status" bar changes its color in dependence of the current conditions. Possible colors are: GREEN (no error), Yellow (minor error) and RED (major error).

Audio Levels (5)

These level bars are representing always the digital signal domain reading as dBFS. The analog levels can be adjusted on inputs and outputs defining the equivalence from the digital clip level of 0dBFS.

Refresh Time (6)

This drop down menu allows setting the refresh rate of the "Current Status" frame from 500 ms to 10 seconds.

Alarms (7)

This window shows current system or connection alarms in real time. It indicated the level of severity by LED colors (red and orange), the alarm name and the alarm description.

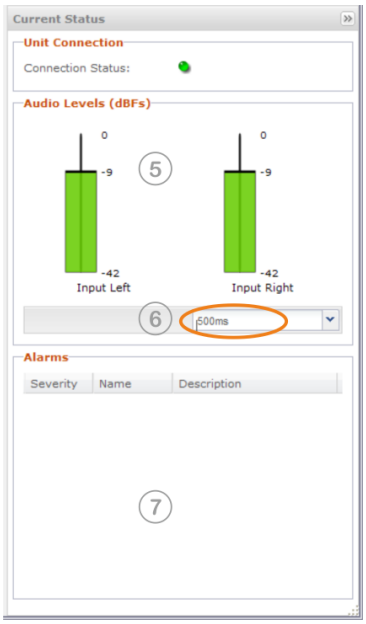

Figure 4-6: Current Status frame on a Stream-In unit

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4.4.2 Main Menu – Status/Unit Status

Starting the WEB application will always open the Main Menu "Unit Status" item with the Unit Status page and the corresponding sub menu items loaded. The Unit Status page is organized in various sections.

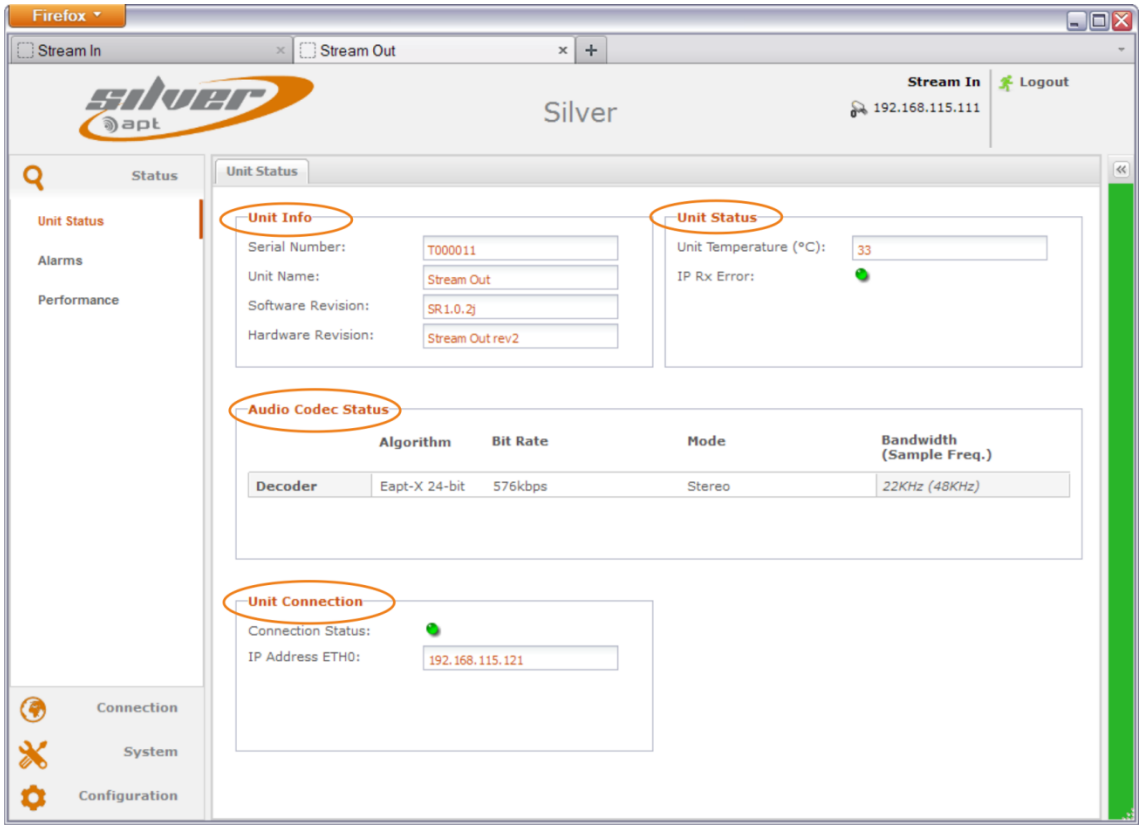

Figure 4-7: Main Menu Status - Unit Status page

Unit Info Section

This section displays the hardware and release version:

1. Serial Number
2. Unit Name (name can be entered on the "About" screen)
3. Firmware Revision
4. Hardware Revision (Stream-In or Stream-Out)

Unit Status Section

1. Unit Temperature

This shows the current Engine temperature of the unit and is not the environmental temperature. This value can exceed 40°C without causing a critical situation. There are no fans fitted as default for two reasons; the emitted noise, and fans are wear and tear items which need to be replaced periodically.

2. IP Transport Error

This error indication is related to IP data stream. If a stream is enabled on the streams table it broadcasts any IP error to this alarm indication.

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Main Menu – Status/Unit Status (*continued*)

- **Audio Codec Status**

  This section provides information about the currently active Codec settings for the Encoder (Stream-In) or the Decoder (Stream-Out).

- **Unit Connection**

  This section shows the IP address of both Ethernet port (ETH). The stylized LED also indicates a physical "Loss of Connection", i.e. if a stream is assigned to the interface (it is a copy of the "Current Status" frame item).

4.4.3 Main Menu – Status/Alarms Page

The following screen will appear, showing the alarm status. Note that a Red stylized LED means the alarm has been raised. Green means everything is working normally and Grey means this alarm is not enabled or not applicable.

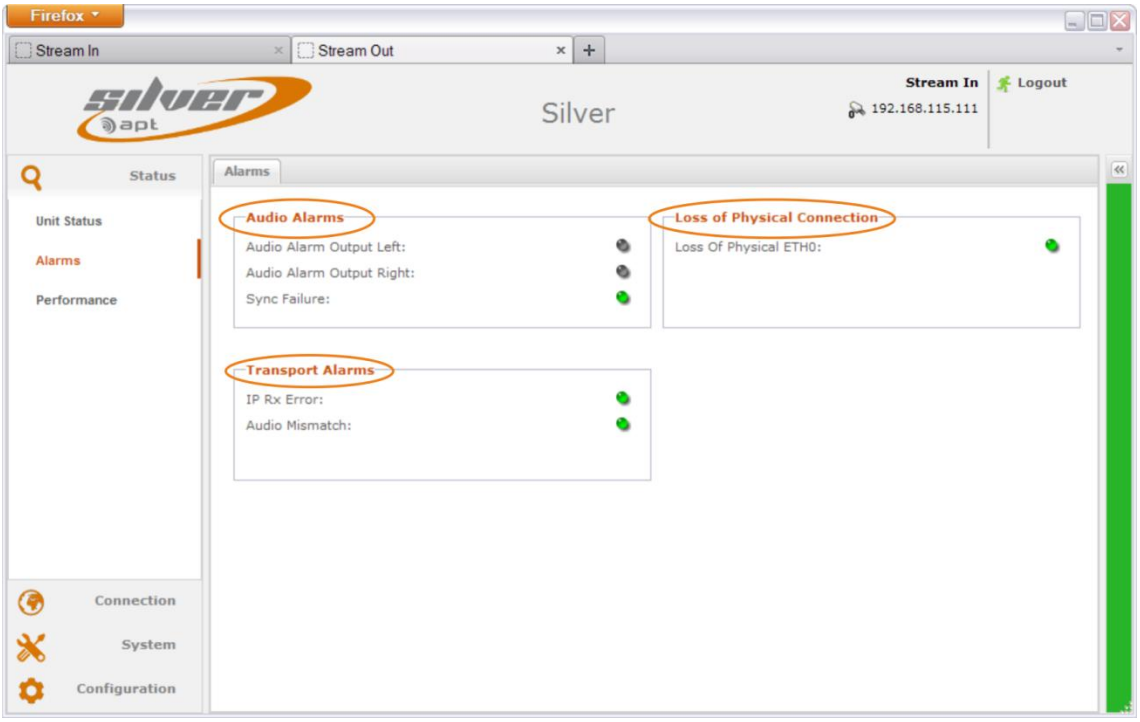

Figure 4-8: Main Menu Status – Alarms page

Note that any of the Transmit or Input Silence Detection alarms will not appear for the IP Decoder Product.

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Main Menu – Status/Alarms Page (*continued*)

Audio Alarms Section

This section shows the status of the audio alarms. The alarms indicated in this section are Silence Detections for Left and Right Input (Stream-In) or Output (Stream-Out) and Sync alarm (on Stream-Out only).

1. Audio Alarms (Silence Detection)

The Audio signal has decreased below the threshold and timeout specified in the audio configuration menu. This alarm will be flagged if silence occurs on the inputs (Stream-In) or on the outputs (Stream-Out) for any reason.

2. Sync Failure (AutoSync Alarm) – Stream-Out only

This Alarm indicates a general sync failure in situation where an excessive amount of packets were dropped or out-of-sequence that results in a gap to the audio stream significant enough to generate the Sync alarm. The different audio algorithms or linear PCM have their specific sync-failure sensitivity.

For Enhanced apt-X this alarm corresponds to the AutoSync Alarm. AutoSync is a bit pattern sent embedded in the Enhanced apt-X audio stream that allows a very rapid resumption of decoding after a gap in the bit stream. This alarm will be flagged if the following conditions occur (for network faults, usually along with other network specific alarms too):

- Mismatch of audio algorithms on Transmit and Receive units

- Connection or transport errors

- A Call being dropped by the Transmit unit

Transport Alarms

This section covers IP alarms only such as IP Rx or Tx errors and audio mismatch.

1. IP Tx Error – Stream-In

The packets from the Tx unit have not been confirmed as hitting the Rx unit – either the Rx unit is stating in its RTCP stream that there has been no packets, the RTCP port has been blocked, or there is another form of network fault resulting in no line of sight to the Rx codec.

2. IP Rx Error – Stream-Out

Packets are not arriving to the Decoder, and it is expecting to see traffic. This can be caused by stream being dropped on the Encoder, a network fault or mismatch in audio algorithm settings.

3. Audio Mismatch

This is likely to be raised if the algorithm does not match on both sides of the link.

Connection Alarm (ETH)

Physical loss of connection to network directly (lead pulled)

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4.4.4 Main Menu – Status/Performance Page

The Performance Monitor is for all active transmit or receive streams. Clicking on an individual stream in the Stream Performance Table will display the performance details below the table. The time interval for the data update is set to 10 seconds as default, but it is user selectable down to 500ms. The Buffer Level Display is the graphical equivalence of the current receive buffer condition (shown on receive routes only).

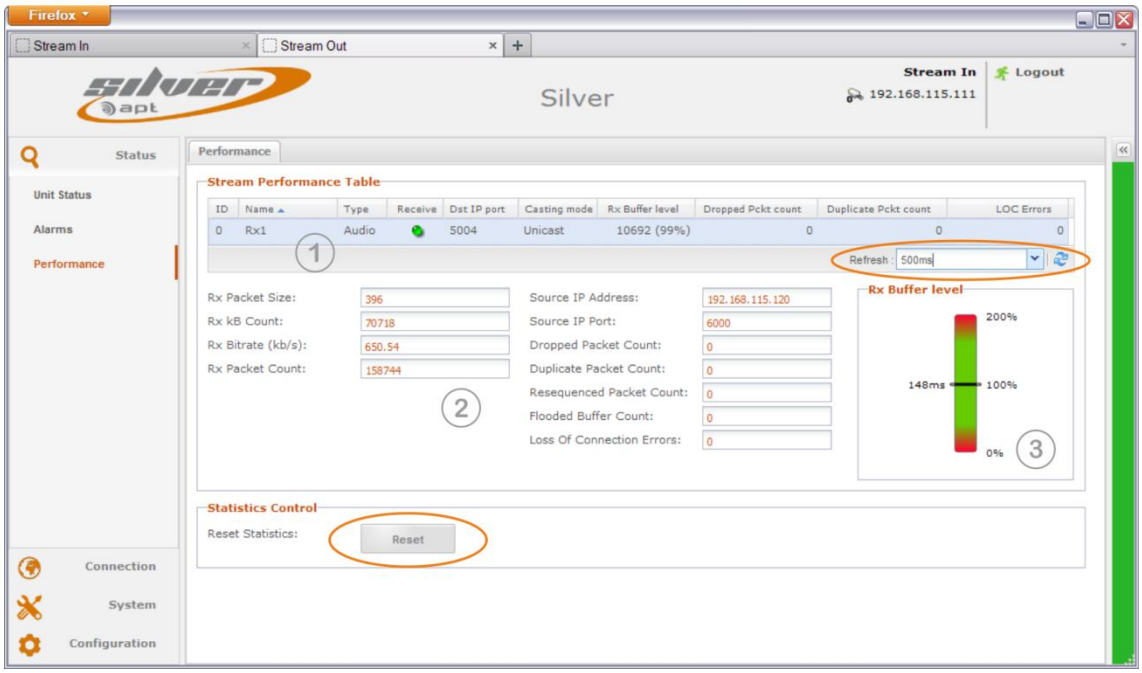

Figure 4-9: Main Menu Status - Performance Monitor page on the Decoder (Stream-Out)

Stream Table (1)

The Stream Table shows all active and inactive streams. On a Decoder (Stream-Out) it is always a single audio stream and a single AUX Data stream, while on the Encoder (Stream-In) many streams can be shown on this table.

Rx or Tx IP Statistics (2)

This section displays the dynamic IP stream parameter as well as the static information like the Source IP address and the Source IP port (on Stream-Out only.

Buffer Level (3)

This colored scale represents the actual de-jitter buffer status. This scale shows in intervals the actual buffer level (on Stream-Out only).

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4.4.4.1 About Stream Tables (general)

In general, a Stream Table (1) is a list of IP-Stream configurations organized in a table. In dependence on where a stream table is accessed it will appear as red-only table, like on the performance monitor page, or the table can be directly accessed for changing values and entries.

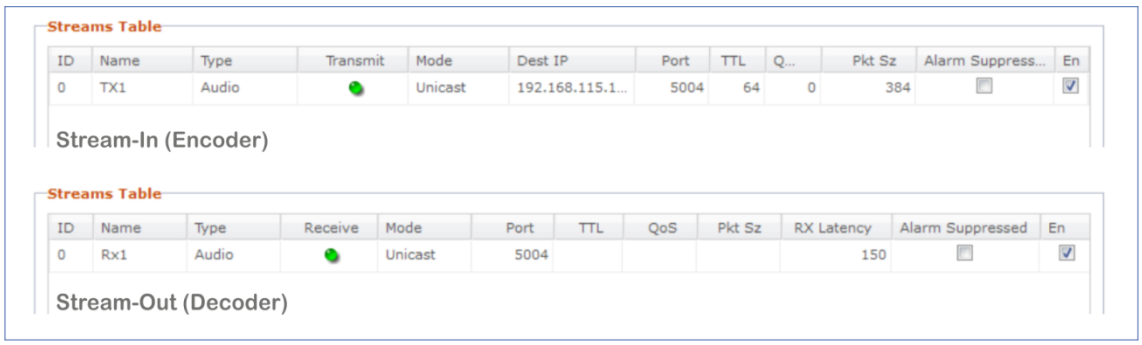

Figure 4-10: Shows Stream Tables from the Encoder and the Decoder

The exposure options of the Stream Table are flexible and can be widely controlled by the user. Clicking on the little arrow on each of the columns (on mouse over) opens a context menu and allows sorting the table ascending or descending. Another submenu provides tick boxes for controlling the columns visibility. In general the stream table exposure also depends on the size of the current browser window. The width of the columns can be adjusted by clicking between the columns and drag the border as appropriated.

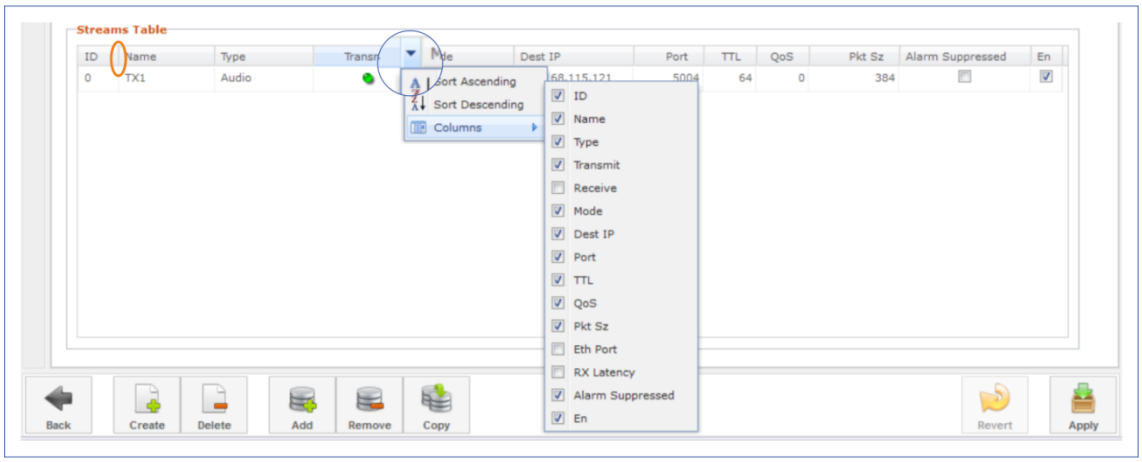

Figure 4-11: Exposure options on the Streams Table

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4.4.4.2 IP Statistics – Details

This section shows the IP statistics (2) of a selected stream when an active connection is in progress, the table below provides the description of each of the statistics (for Encoder

Statistic	Description
Rx/Tx Packet Size	Size of received or transmitted packet in Bytes
Rx/Tx kB Count	Kilo Bytes received or transmitted
Rx/Tx Bit Rate	Bit rate of receive or transmit stream (data & IP overhead)
Rx/Tx Packet Count	Number of packets received or transmitted
Rx Source IP Address	IP Address of the transmitting Codec
Rx Source IP Port	IP Port on which the transmitting Codec is sending the stream
Rx Dropped Packets Count	Number of dropped packets
Duplicated Packets Count	Number of duplicated packets arrived on the Rx stream.
Re-Sequenced Packets Count	Number of packets that reached the de-jitter buffer out of sequence (indicates also the level of re-sequencer activities)
Flooded Buffer Count	The Buffer has detected above 180%. Buffer level has been normalized to latency
Loss of Connection	Loss of connection, the buffer has dropped to less than 10% and the receiver has reset the input buffer

Statistic records can be reset by clicking on the "Reset" button (refer to figure 21).

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4.4.5 Main Menu – Connection/Connection Page

The "Connection Page" is the page where IP streams and connections must be created and can be managed. Basically a "Connection" consists of two parts, the audio settings and the IP configuration.

The table in the middle of this page shows the currently applied Audio setting on the Encoder (Stream-In) or the Decoder (Stream-Out).

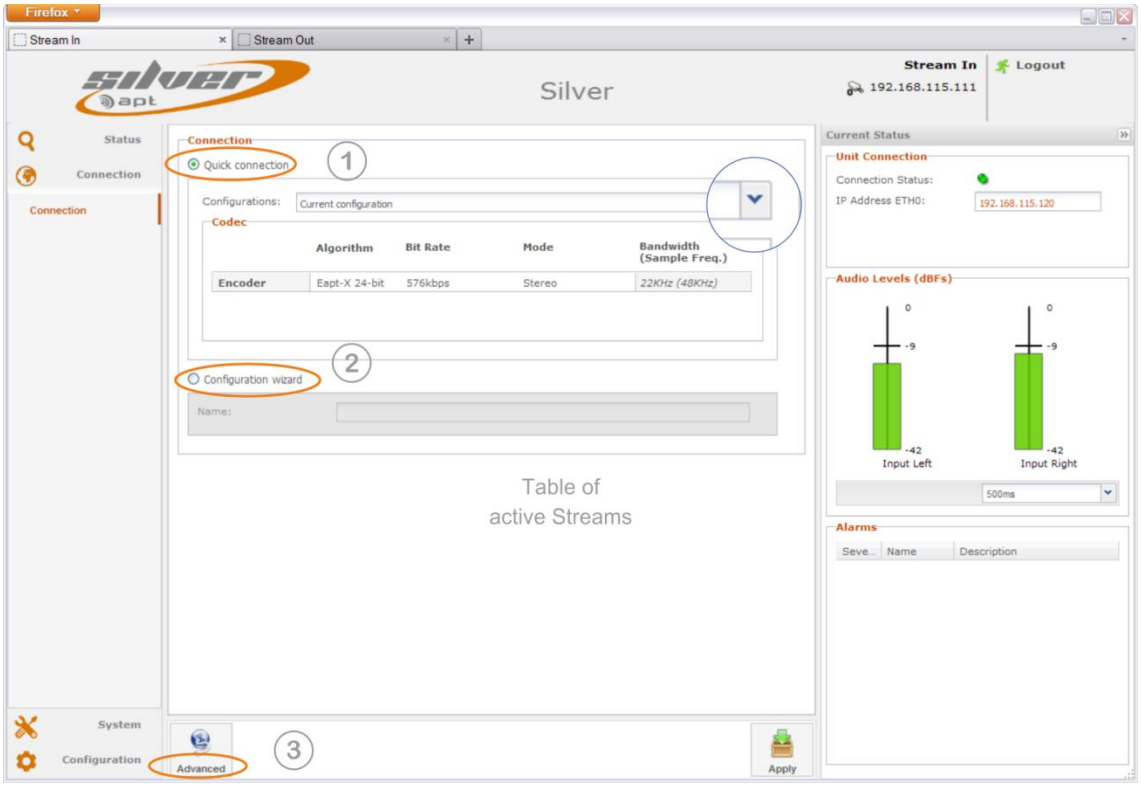

Figure 4-12: Shows the Connection Page of the Stream-In unit

The Silver WEB GUI offers three ways to create and apply a configuration.

2. Quick Connection (applying a profile to the unit)
3. Connection Wizard (a step-by-step guide)
4. Advanced Configuration (direct editing of stream table and audio mode settings)

Note: All changes made on the WEB GUI can be reverted and will not become active until it was applied to the Codec hardware!

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Main Menu – Connection/Connection Page (continued)

- **Quick Connection (1)**

  A "Quick Connection" is basically a pre-configured and previously stored profile. This profile was created and merged from an audio mode configuration and an IP stream setup. Before a Quick Connection can be used, a profile must have been created first.

  Clicking on the little arrow opens a list with available profiles. Once the required profile was selected it can be applied seamlessly to the Codec by clicking the "Apply" button on the bottom right corner.

- **Configuration Wizard (2)**

  The "Configuration Wizard" guides to a step-by-step procedure creating a profile. It prompts for audio settings and for IP settings. Finally it creates a profile by merging both components. Once a profile was created it appears on the Quick Connection drop down list.

- **Advanced Configuration (3)**

  The "Advanced" configuration procedure provides all configuration and management options on a single page. Other than the Configuration Wizard the "Advanced" configuration allows modifications on the currently applied profile and configuration. It also provides options and tools to edit already created profiles.

4.4.5.1 Connection Wizard - Creating a Profile

- **Connection Wizard – Profile Name**

Selecting the radio box "Connection Wizard" on the connection page starts the Wizard. Firstly a profile name must be entered in the Name field. Once a name is entered the "Next" button becomes active. Clicking on this button opens the next page prompting the audio Codec settings.

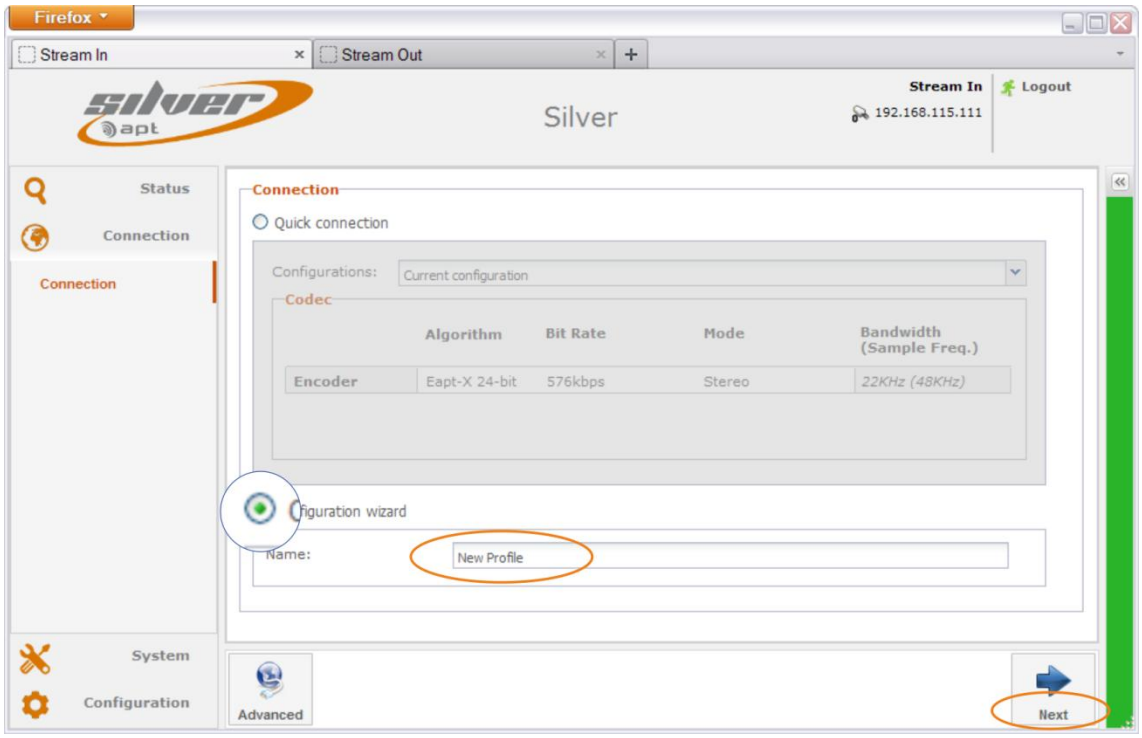

Figure 4-13: Shows the Connection Wizard's first page

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4.4.5.2 Connection Wizard – Codec Settings

The next page guides to the Audio mode settings. The Silver units provide similar pages for the Encoder and the Decoder depending on the type of unit, hence the Encoder configuration is provided on the Stream-In unit and the Decoder configuration on the Stream-Out.

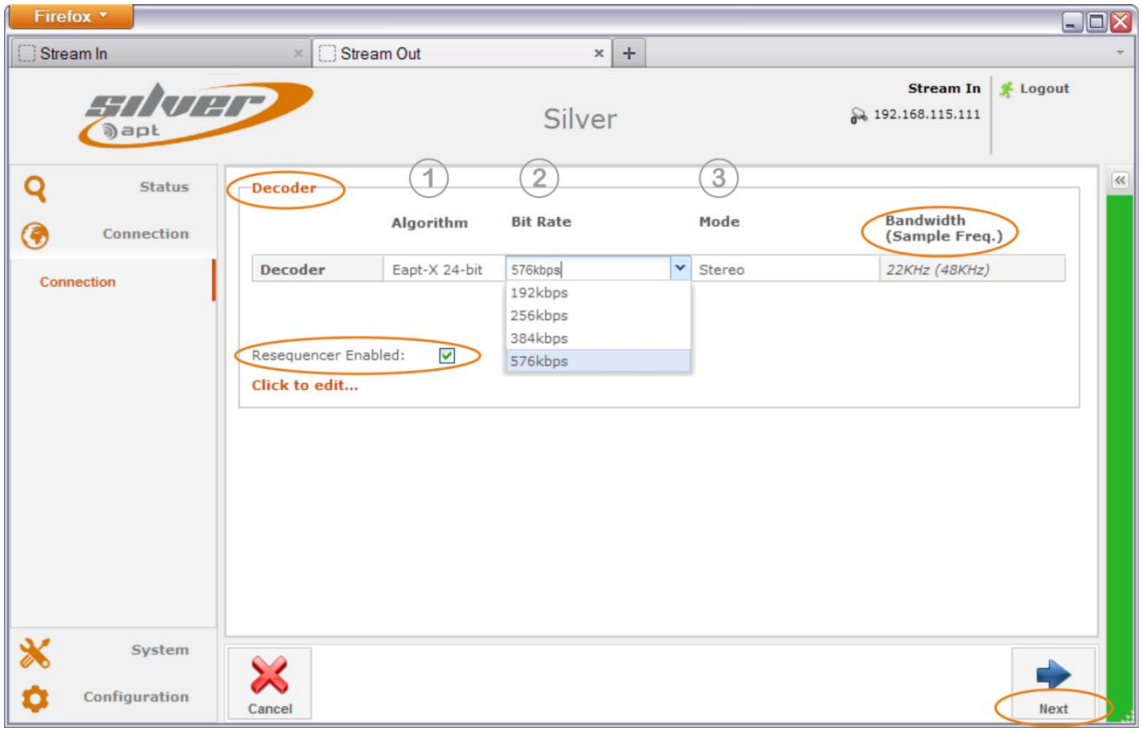

Figure 4-14: Shows the Decoder configuration page (Stream-Out)

- **Algorithm (1)**

  Clicking on the "Algorithm" field opens the drop down list offering the available audio codec formats. Currently Enhanced apt-X and Linear PCM are available. Select the desired format then click on the "Bit Rate" field.

- **Bit Rate (2)**

  Corresponding to the chosen audio format this drop down list presents the available bit rates. After selecting the bit rate, the "Mode" field entry may be filled automatically in dependence of the audio mode and chosen bit rate.

- **Audio Mode (3)**

  Audio Mode means either Mono or Stereo. If this field is not computed automatically, chose the desired mode. Finally the "Bandwidth" field displays the resulting audio bandwidth and the sample frequency.

ⓘ *The Encoder and Decoder configuration is almost identical. There is one important check box on the Decoder page: The Re-Sequencer check box – keep this enabled! This ensures that packets arriving out of order can be re-ordered inside the de-jitter buffer.*

After completing the Encoder/Decoder settings also, click on the "Next" button to enter the IP Stream configuration page.

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4.4.5.3 Connection Wizard – IP Streams Configuration

Reaching this window within the Connection Wizard implies that your Codec settings are completed. The audio settings can be changed using the "Advanced" configuration option, but not within the Connection Wizard.

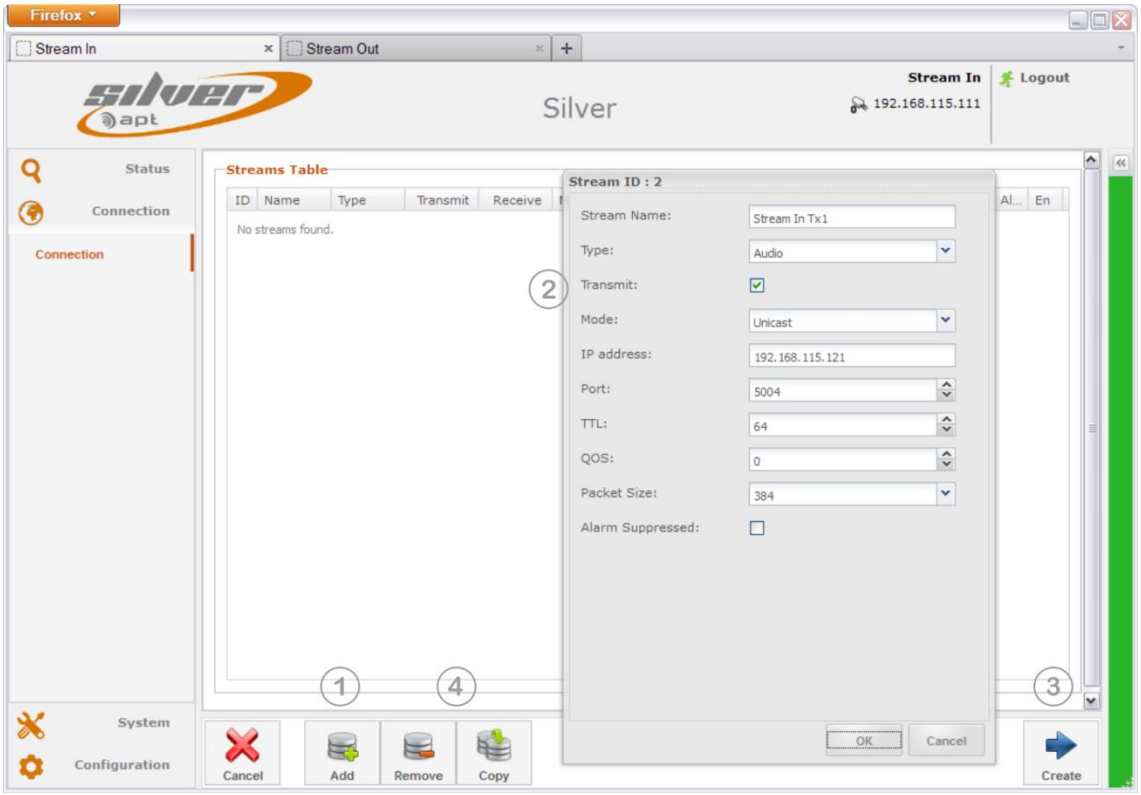

Figure 4-15: Shows the IP Stream configuration page on the Encoder with the stream setup window

Adding a Stream

Clicking on the "Add" button (1) opens the Stream Configuration window (2). This Window provides all setting options for the desired IP connection. On the Stream-In (Encoder a second or more streams can be added by clicking on the "Add" button again. Each stream gets a unique ID assigned by the system. This ID cannot be modified by users.

As long as the profile is not yet created a stream can be edited by double clicking on the stream or can be deleted by clicking on the "Remove" button (4). The "Copy" function (4) allows copying a selected stream.

If the "Cancel" button is clicked, all configurations will be deleted including the audio settings and the profile name.

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Connection Wizard – IP Streams Configuration (*continued*)

Creating an IP Stream (2)

The Stream Configuration window provides the configuration options. This table shows the options for the Encoder and the Decoder!

Field	Description
Stream Name (Stream-IN/Out)	A name must be given – there are no constraints applying a name
Type (Stream-In/Out)	Stream Types are: Audio or AUX data – Aux data can be set to duplex on Encoder and Decoder
Transmit (Stream-In)	Enable this check box for a Transmit stream
Receive (Stream-Out)	Enable this check box for a Receive stream
Transmit/Receive (Stream-In/Out)	Enable both check boxes for a duplex AUX data stream only
Mode (Stream-In/Out)	Select the casting mode, either unicast or multicast
Dest. IP Address (Stream-In)	Enter the destination IP address (remote receiver IP address)
IP Port (Stream-In/Out)	Enter an IP port number to transmit to or receive from. For RTP streams chose even port number only (i.e., 5004, 5006, 5008 etc.) Note: This is not the local source port number!
TTL (Stream-In)	Time to Live: Chose an appropriate value or keep the default
QoS (Stream-In)	Quality of service (DiffServ supported only), this value must be given by the network provider or administrator (0=disabled)
Packet Size (Stream-In)	There are various inter-dependent parameters influencing the best choice for the packet size. A good starting point is to use 384Bytes for Eapt-X™ formats and 1024Bytes for linear PCM
Rx Latency (Stream-Out)	This is the size of the receive buffer (De-Jitter buffer) in Milli-seconds. This buffer must not go below a minimum size. The minimum size depends on the jitter behavior of the network and the packet sizes. A good starting point is the default value of 150ms.
Alarms Suppressed (Stream-In/Out)	Checking this box, disabled all alarms generated by this IP stream

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4.4.5.4 Connection Wizard – Creating a Profile

After the streams were created they are now appearing on the Streams Table. The little red marker on the table fields indicate that the stream was not yet saved in a profile and can be modified.

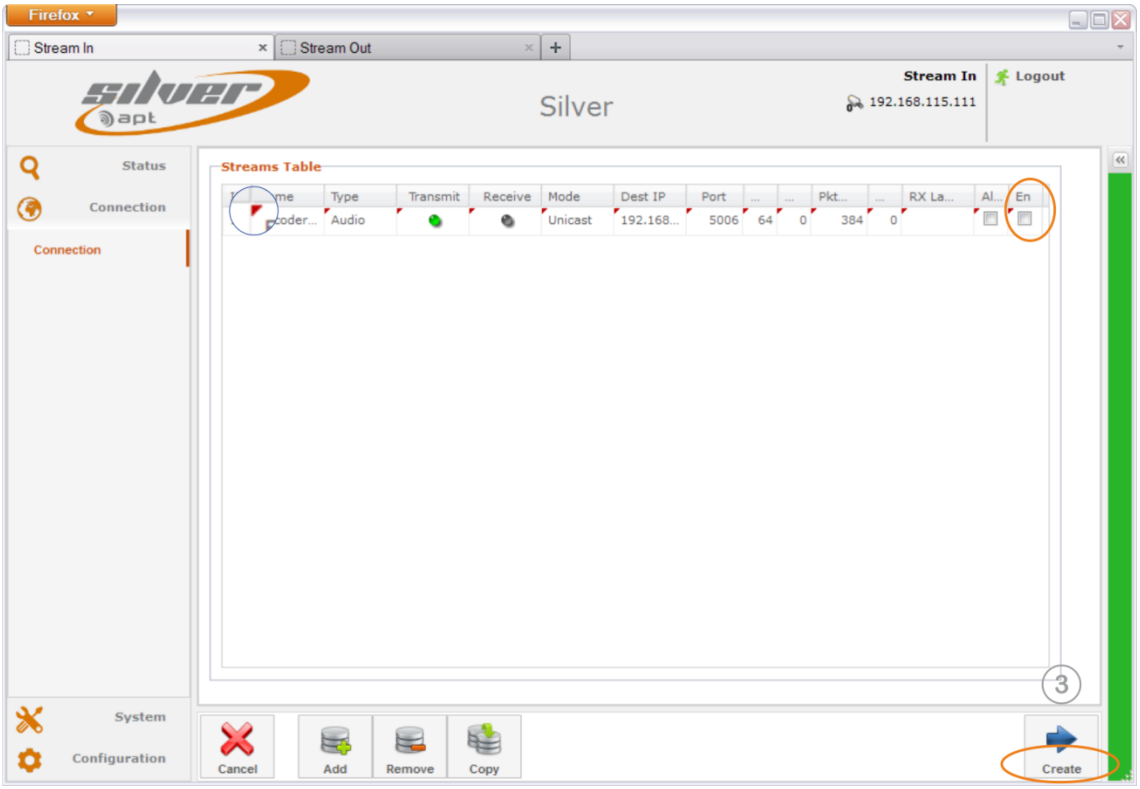

Figure 4-16: Shows two streams ready for being merged into a profile

ⓘ *Finally the streams should be enabled before they can be merged into a profile. The most right column on the stream table presents the "Enable" checkbox.*

Clicking on the "Create" button (3) now merges the audio settings with the IP stream configuration into the new profile. This completes the Connection Wizard and opens the "Advanced" configuration window.

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4.4.5.5 Advanced Configuration

The "Advanced" configuration page can be opened directly from the Connection Page, or after the Configuration Wizard procedure was completed.

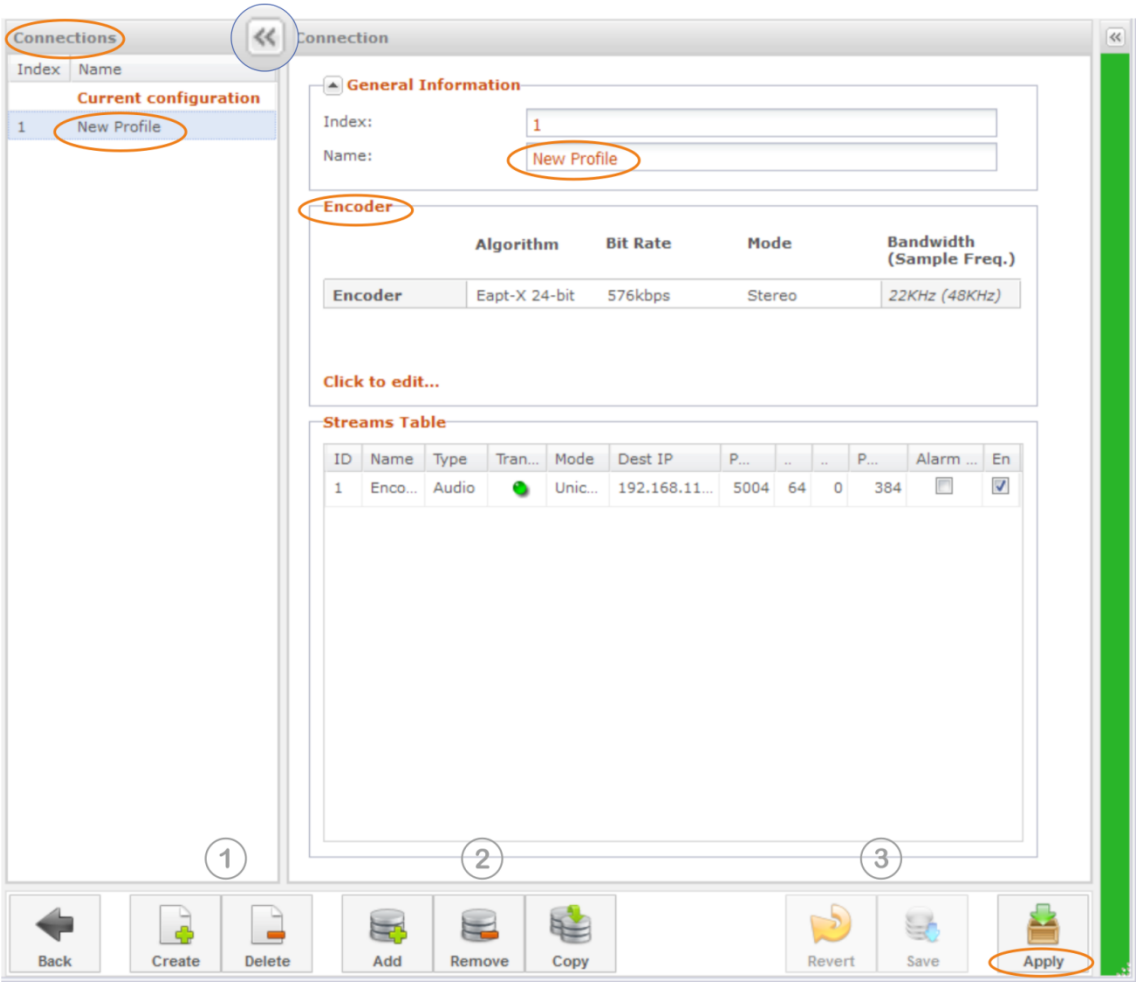

Figure 4-17: Shows the Advanced configuration window

The Connection Wizard as described earlier has created the "New Profile" from the audio settings and the IP stream configurations. The "New Profile" now appears in the list of profiles on the left hand side (Connections). This list of profiles is also accessible with the "Quick Connection" tool. A click on the little arrow opens or closes the profile list.

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Advanced Configuration *(continued)*

The Advanced configuration page offers all options for creating new profiles or modifying an existing one or deleting profiles from the list. It also allows changing the currently applied (and active) configuration on the fly.

Editing a Profile

Clicking on a profile in the profile list loads the configuration into the main page. The screen shot shows "New Profile" Index no. 1 on the streams table. With the tool bar items "Add", "Remove" and "Copy" the streams can be processed. The Encoder (Stream-In) or Decoder (Stream-Out) settings are accessible in the section above the streams table. Once a modification was done, the changes can be saved to the profile by clicking on the "Save" button (3).

Creating a Profile

Clicking the "Create" button (1) creates a new and empty profile. A new configuration can now be merged and saved to a new profile. Clicking the "Delete" button deletes a selected profile from the list.

Applying a Profile to the Codec

Clicking on a profile in the profile list loads the configuration into the main page. Clicking "Apply" on the button right corner loads the profile to the Silver hardware.

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4.5 Main Menu – System

This section provides the general system setup items

4.5.1 System – Date and Time

- **Set Date and Time**

  The Silver units run its real time clock. Date and Time entered here sets this clock

- **Set System Time Zone**

  Select the time zone where the unit is installed

- **NTP Server**

  Allows enabling/disabling the NPT client (Network Time Protocol) as well as entering the NTP server IP address

4.5.2 System – Users

- **Web Accounts**

  The user management offers a two-level hierarchy. The Administrator account allows full access to the entire system, while the Read-Only Account may be used for monitoring purposes only.

4.5.3 System – Network

- **Ethernet Mode**

  For the IP interface the IP address setting mode can be chosen:

  1. Static (manual IP address settings)
  2. DHCP (takes the IP settings from a DHCP server)

- **Manual IP Settings (static mode)**

  1. IP Address
  2. Netmask
  3. Gateway
  4. MAC address displayed (read only)

- **DNS Server Addresses**

  1. Primary DNS
  2. Secondary DNS

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4.5.4 System – Diagnostics

- **Restart**

  Unit Reboot

- **Default Configuration**

  Reset System and Configurations to factory defaults but keeps the IP address settings.

4.5.5 System – Update

For a Firmware Update, section 6 MUST be consulted!

4.5.6 Licenses

This page provides the Unit Details necessary for creating and applying an options license. License options are e.g. SureStream or additional audio algorithms etc. Licenses already purchased and applied to the unit will be displayed on this page. Clicking on the "Add" button opens the entry field for the license key. Once the key-code is entered, press apply to upload the key to the Codec hardware.

For getting an options license, the details displayed on this page must be forwarded to the responsible sales office (MAC address and serial number). This can be done efficiently by email.

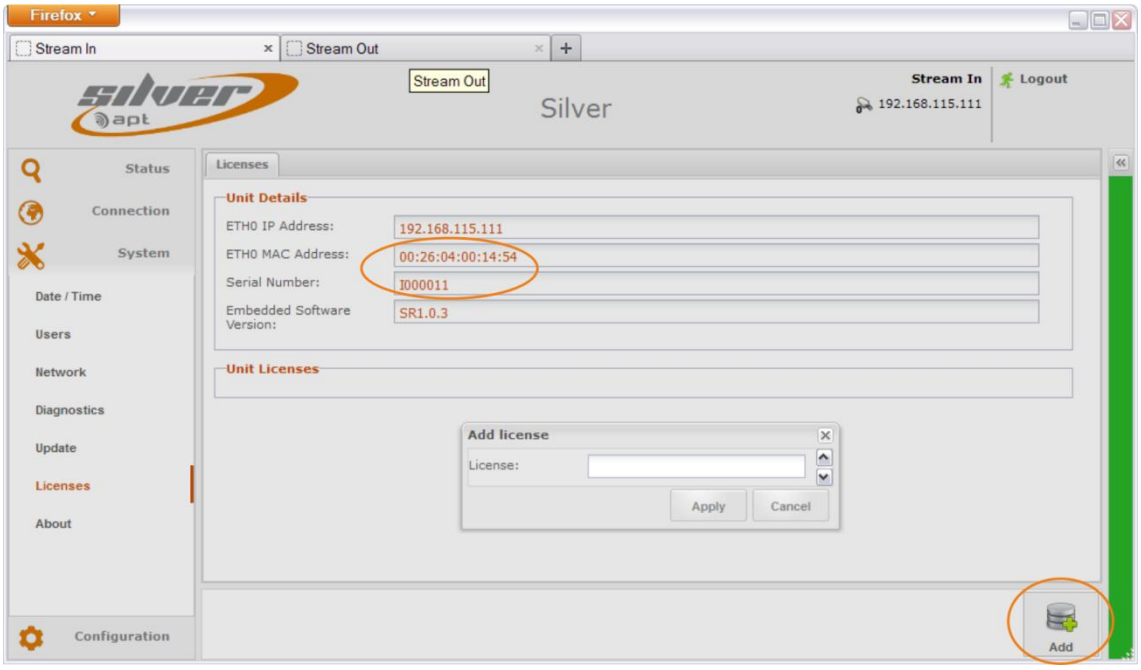

Figure 4-18: Shows the unit parameter for getting an options license

Once the Unit Details, as shown above, are forwarded to the sales office, a Key-Code will be delivered. By clicking on the "Add" button the "Add License" window appears where the Key-Code must be entered and applied.

This Key is dedicated to the particular unit and cannot be transferred to any other unit. Once the license key was applied, it cannot be removed and will not be overwritten by a firmware update.

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4.5.7 About

"About" shows the unit hard- and software versions.

It also provides a little chat box allows sending short messages to other actually logged in users.

The entry field "Unit Name" allows entering an individual name for this particular Silver unit. This name appears on the browser tab as well as on the unit's status page.

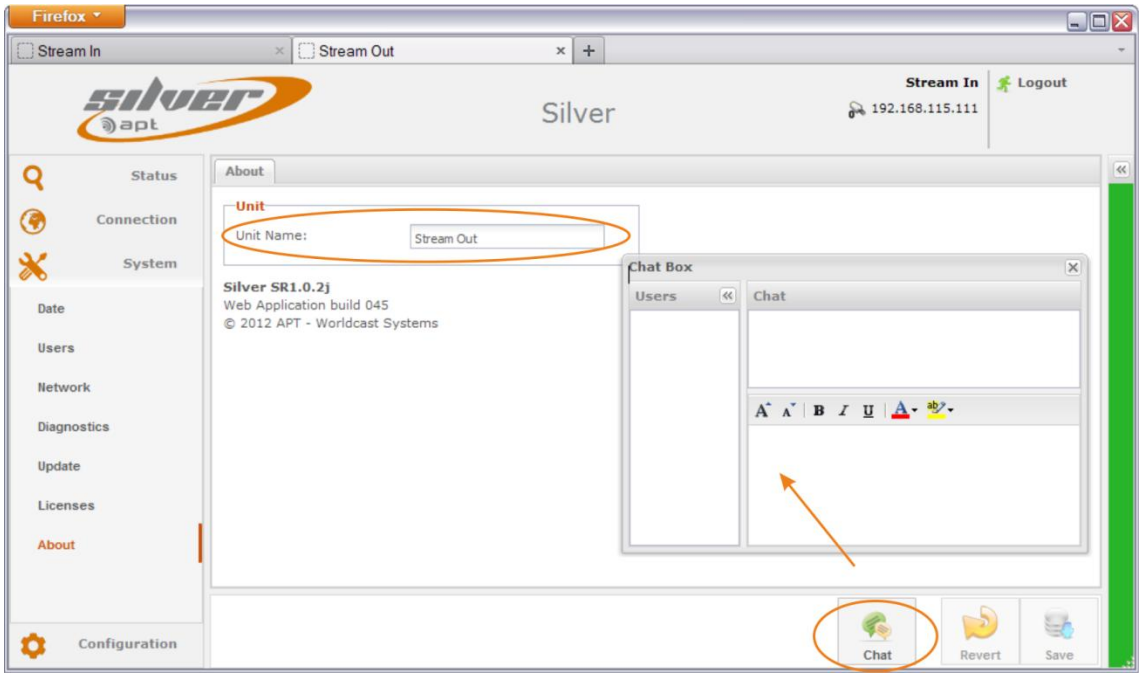

Figure 4-19: Shows the "About" page with the Chat box

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4.6 Main Menu – Configuration

The configuration menu provides two submenu items, the Audio Configuration page and the AUX Data page. These are basic configurations controlling operational modes and system behaviors.

4.6.1 Configuration – Audio Configurations

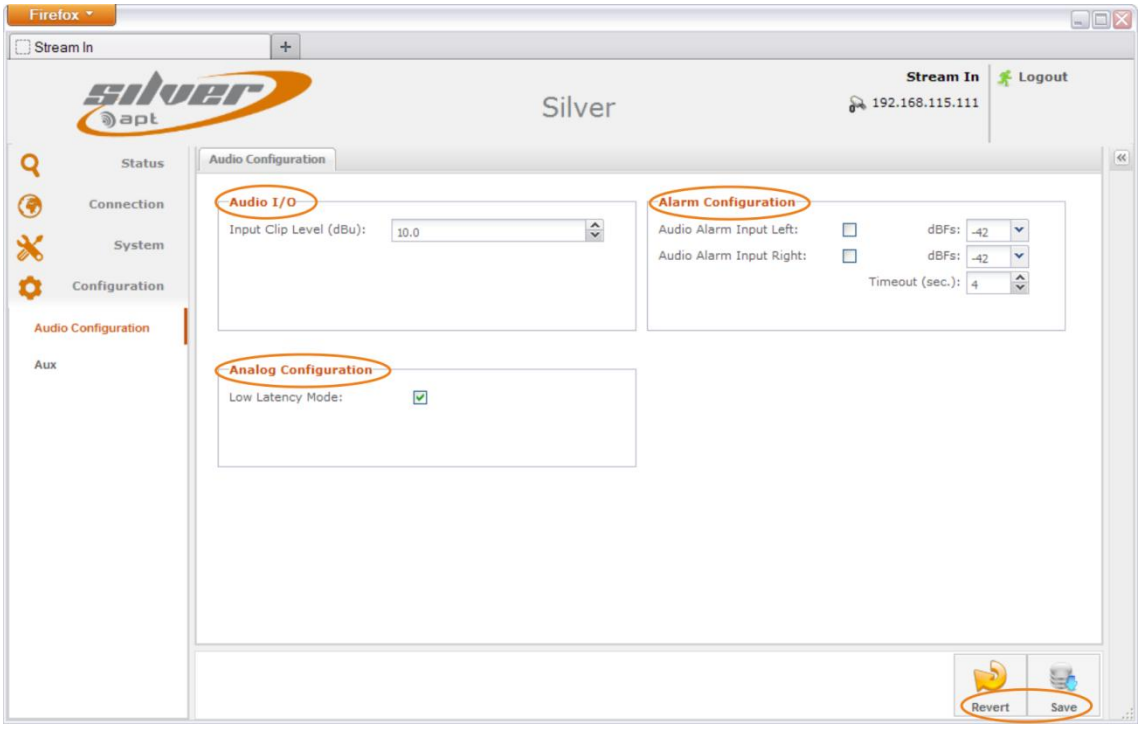

Figure 4-20: Shows the Audio Configuration page in the Encoder (Stream-In RCA version)

All settings can be reverted or saved by clicking on either of the buttons as shows above.

The screenshot above shows the audio configuration page of a Stream-In Encoder with RCA connectors. The XLR version allows changing the Input or Output impedance in addition. The tables below outline the configuration options on both versions.

Notes:

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Audio I/O and Alarm Configuration (RCA)

This section provides the following configuration options:

Configuration	Options	Description
RCA version: Input Clip Level (dBu) (Stream-In)	Values 0-10 dBu	Adjusts the analog Input level in reference to the digital dBFS in increments of 0.1 dB
RCA version: Output Clip Level (dBu) (Stream-Out)	Values 0-10 dBu	Adjusts the analog Output level in reference to the digital dBFS in increments of 0.1 dB
Audio Alarm Input L/R (Stream-In)	Enable/Disable Threshold Level	Ticking the boxes enable these alarms Level setting from -3 dBFS to -42 dBFS in increments of 3 dB
Audio Alarm Input L/R (Stream-Out)	Enable/Disable Threshold Level	Ticking the boxes enable these alarms Level setting from -3 dBFS to -42 dBFS in increments of 3 dB
Timeout (Stream-In/Out)	Value	This setting defines the period of time the signal has to be below the threshold level before the audio alarm is flagged.

Analog Configuration – Low Latency Mode

This "Low Latency Mode" effects the **analog** signal processing and improves the system latency by approx. -1.5 ms. This mode disables and bypasses the **input** Sample Rate Converter which is obsolete in these modes (Stream-In only):

- Linear PCM at F_s = 48 kHz (any linear PCM mode that uses 48 kHz Sample Frequency)
- Eapt-X® at F_s = 48 kHz (any Eapt-X® mode that uses 48 kHz Sample Frequency)

Configuration	Options	Description
Low Latency Mode	Enable/Disable	Ticking this box enables the low latency mode

Note: This latency improvement takes place on audio formats (as listed above) that run at 48 kHz sampling frequency. Whenever another mode is selected, e.g. Linear PCM with up to 15 kHz frequency response (equals F_s = 32kHz) then this mode is automatically deactivated regardless of the enable/disable status on this configuration page. As long as this mode is enabled it automatically takes place if an audio mode at 48 kHz is selected.

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Audio I/O Configuration (XLR)

Configuration	Options	Description
XLR version: Input Clip Level (dBu) (Stream-In)	Values 0-24 dBu	Adjusts the analog Input level in reference to the digital dBFS in increments of 0.1 dB
XLR version: Output Clip Level (dBu) (Stream-Out)	Values 0-24 dBu	Adjusts the analog Output level in reference to the digital dBFS in increments of 0.1 dB
XLR version: Input Impedance (Stream-In)	High 600 Ω	Analog Input impedance In: >10 kΩ Sets the Input impedance to 600 Ω
XLR version: Input Impedance (Stream-Out)	Low 600 Ω	Analog Output impedance In: <50 Ω Sets the Output impedance to 600 Ω

Audio Alarm settings are equal on RCA and XLR version

4.6.2 Configuration – AUX Data Configuration

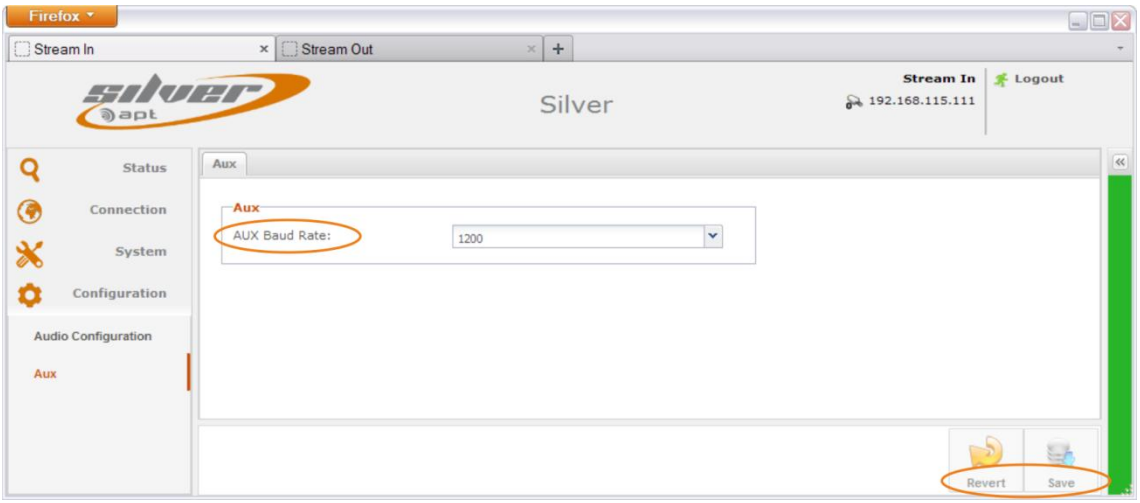

Figure 4-21: Shows the AUX Data configuration

Configuration	Options	Description
AUX Data Baud Rate (Stream-In/Out)	Value	The drop down list provides baud rate setting from 1.200 to 115.200 Baud

The AUX data connection can be configured as duplex connection on the Stream Table.

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5.0 SureStream

SureStream Technology is a standard feature of the Silver IP Streamer range.

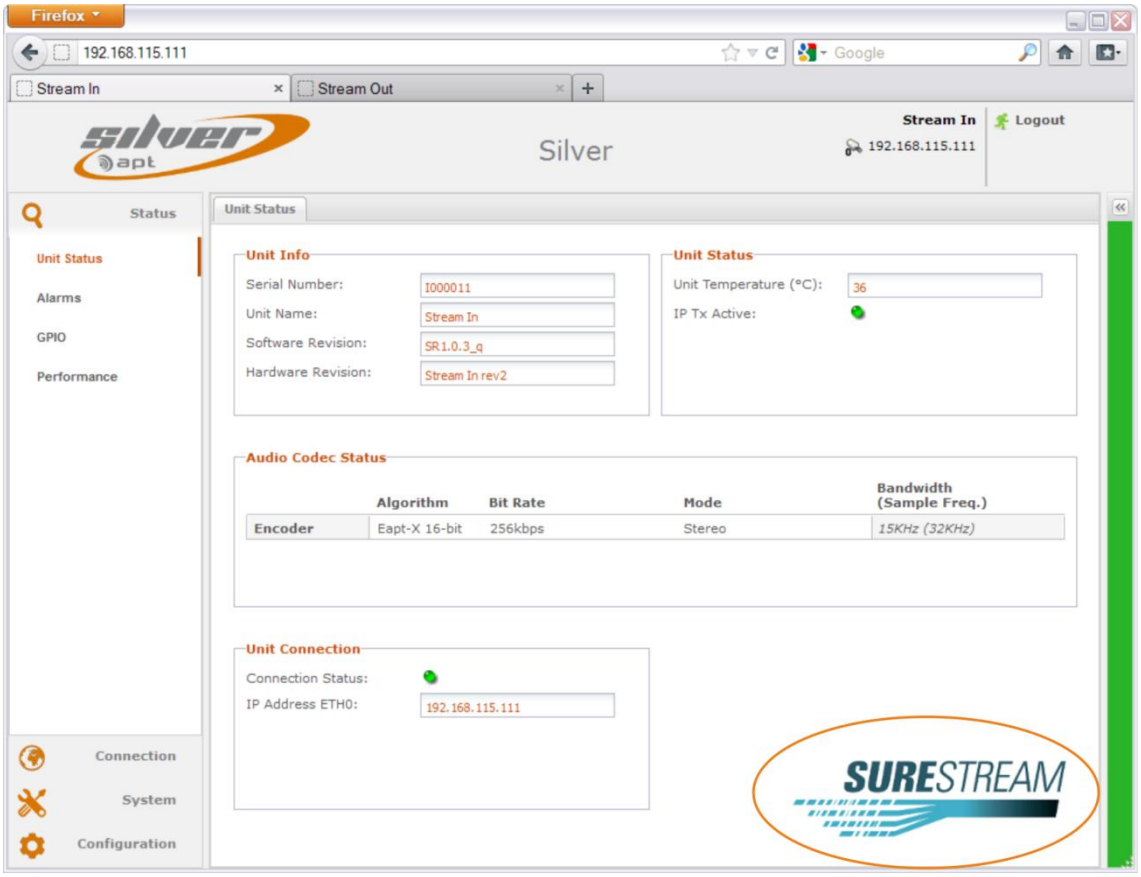

Figure 5-1: Shows the Status Page with SureStream enabled

5.1 About SureStream

SureStream Technology is a revolutionary innovation from APT that enables broadcasters to use inexpensive IP links and still maintain professional broadcast-grade audio quality and reliability. It delivers the audio quality and reliability known from a synchronized TDM based link at a fraction of the associated cost.

The technology approach of SureStream is based on redundant streaming. SureStream replicates a single program audio stream and passes it through the Statistical Diversity Generator. Following this process the redundant program streams appear on the network as unique streams generated from different or the same source.

In practice a single stream will be duplicated on the IP port as SureStream component streams. This feature works on a single physical port (like on the Silver Streamer Range) as well as on Codec systems equipped with dual IP ports.

SureStream is highly efficient on potentially lossy networks like the public Internet. It can also be used for permanent redundant streaming on managed networks.

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About SureStream *(continued)*

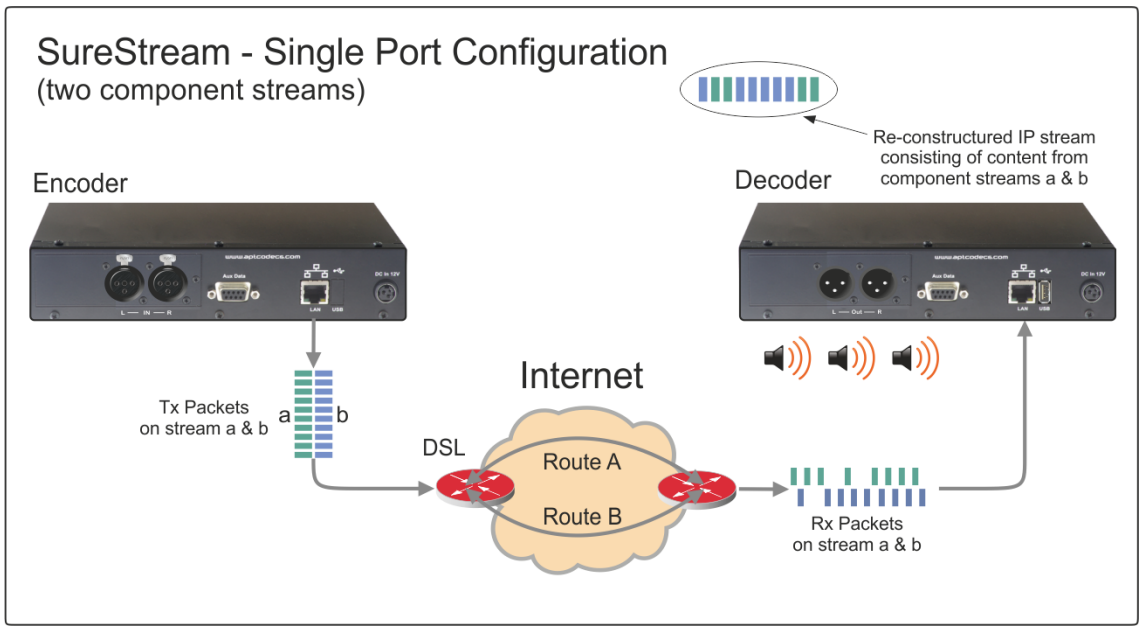

Figure 5-2: Shows a typical configuration running SureStream on a single IP port

The configuration example above shows a typical SureStream configuration using two SureStream component streams. This example uses the Internet with standard xDSL access services. Diverse streaming on the internet has the effect, that the access routers treat each SureStream component stream individually by passing it randomly on different paths to the destination IP address.

On the receiving end, the Enhanced Re-Sequencer generates from all component streams the single packet stream on a first-in-first-out packet basis. All duplicated/redundant packets will be dropped. The number of component streams is not limited by the SureStream technology.

SureStream is a powerful algorithm that protects an IP link against packet losses and Loss of Connection errors. The latter protection can be achieved only if the Codec device uses dual IP ports for streaming out the component streams.

On a single IP port device, like the Stream-In and Stream-Out, SureStream cannot protect the IP link against Loss of Connection errors.

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About SureStream *(continued)*

5.1.1 SureStream Encoder

On the Encoder side the heart of SureStream is the Statistical Diversity Generator. This generator ensures that the component streams appear on the network as diverse as possible. This generator runs an algorithm that can be set up with three different sets of parameters (called "levels") allowing the use of more than one component stream while keeping each stream divers from each other.

5.1.2 SureStream Decoder

Once SureStream has generated duplicated streams with the same payload intended to reach the same receiver, the Decoder on the receiving end must cope with a massive amount of redundant packets arriving from a single or different networks. Allowing the Decoder to cope with duplicated packets it must run the complementary algorithm as on the Encoder side; this is the Enhanced Packet Re-Sequencer Engine.

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5.2 SureStream – Encoder Configuration

Creating a SureStream component stream follows basically the same procedure as a normal stream configuration. A set of component streams will be identified as part of a SureStream group by the equal packet size. This is an important indication, because within a set of redundant streams the packet sizes must be equal. If a set of component streams are configured correctly, the connection page will indicate this by grouping the corresponding streams (SureStream group). If the packet size is not equal on all component streams, the streams will be treated separately and no SureStream group will be generated.

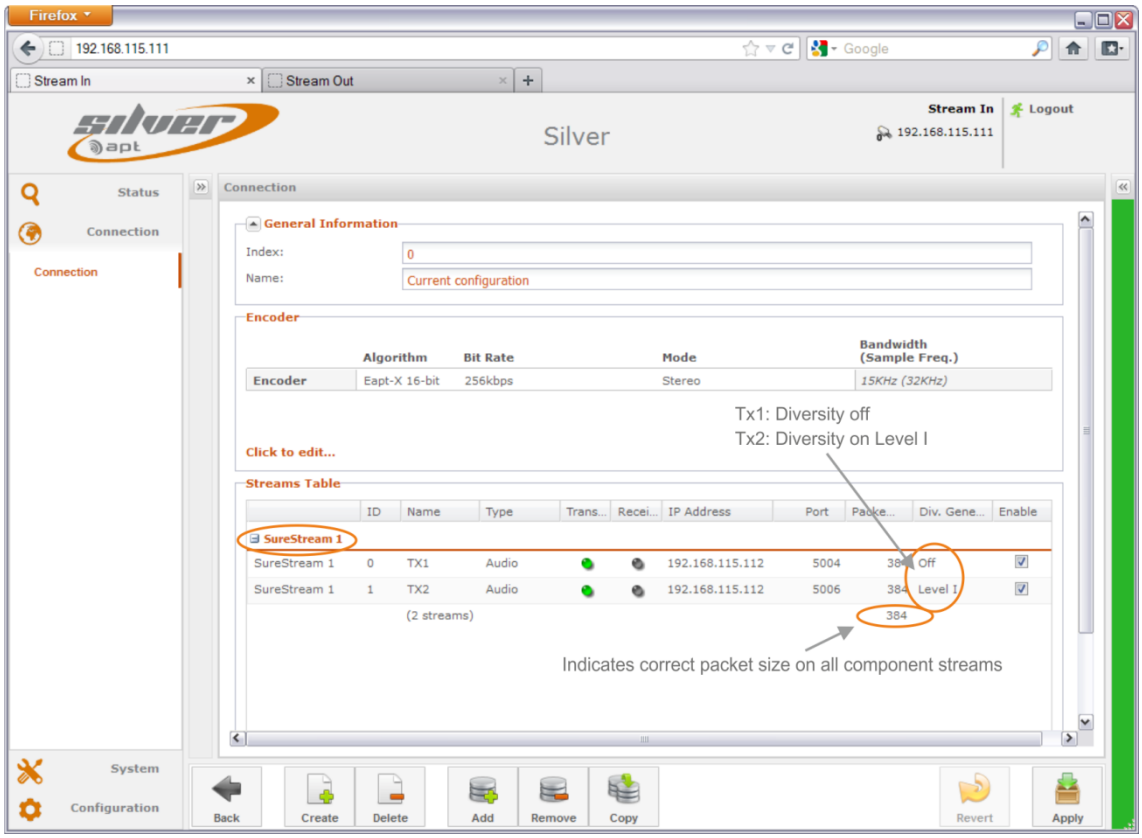

Figure 5-3: Shows a SureStream configuration on the Encoder

A SureStream group (i.e. SureStream 1) will be displayed only if the packet sizes on ALL component streams are equal!

The figure above shows a working Encoder configuration in principal with two streams are assigned to the same destination IP address, hence they are received on a single port at the Decoder end. This implies that both streams are going out on the same ETH port on the Encoder into a single network. – In a real world application this configuration will protect the IP link against packet losses very efficiently as explained above.

The next section outlines the recommended and mandatory settings for a group of component streams.

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SureStream – Encoder Configuration *(continued)*

Once the SureStream license was applied to the unit the Diversity Generator option appear on the stream configuration window. Again, creating a group of component streams follows the normal procedure.

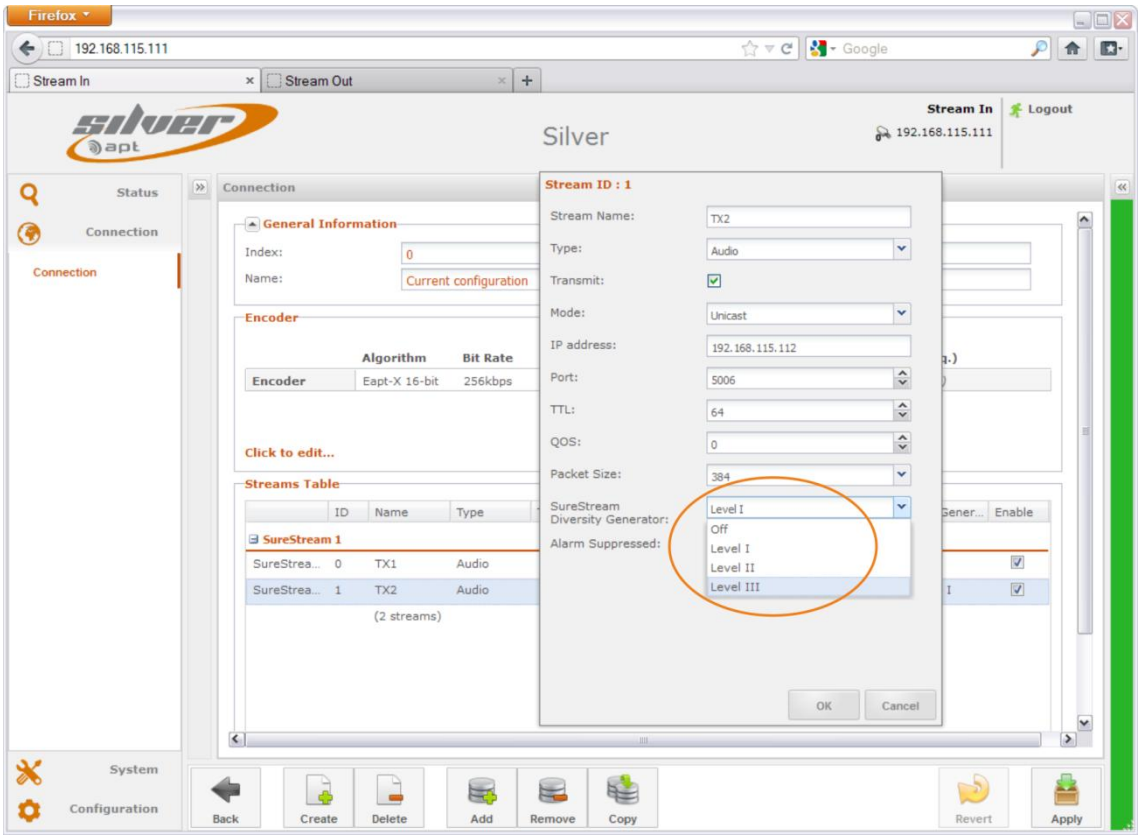

Figure 5-4: Shows the Diversity Generator options on the stream configuration window

5.2.1 About Diversity Generator Levels

The SureStream Diversity Generator can be either disabled or set from "Level I" to "Level III". A "Level" does not indicate the level of severity of SureStream. A "Level" is a set of parameters used by the Diversity Generator to ensure the stream diversity. All three "Levels" work on the same level of severity but differently from each other.

Having three sets of parameters allows to configuring more than one redundant stream and keeping all streams processed individually by the Diversity Generator. It has been seen sometimes that a particular "Level" delivers better results than another.

Therefore it is worthwhile to trying out what Level delivers the best results in a particular network environment.

ⓘ *Whenever a set of SureStream component streams are created, one of them should have the Diversity Generator Level set to off. All other component streams should run on a different level (I-III).*

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5.2.2 Creating a Set of Component Streams

A set of component streams processed by the Diversity Generator is not limited to a particular number of streams. In practice a set of two component streams works reliably. However, the Silver Streamer allows to creating more than one redundant stream.

Field (SureStream)	Description
Stream Name	A name must be given – there are no constraints applying a name
Stream Type	SureStream supports "Audio" streams only
Transmit Mode	SureStream supports "Transmit" mode
Receive Mode	SureStream supports "Receive" mode
Transmit/Receive	SureStream supports "Duplex" mode
Mode	SureStream supports "Unicast and Multicast"
Destination IP Address	This must be the same destination address on all component streams allowing the receiver to receive all streams on its ETH port.
IP Port	For each stream - the IP port must be **different**
TTL	For all streams - the TTL value must be **equal**
QoS	For all streams - the QoS setting must be **equal**
Packet Size	For all streams - the Packet Size must be **equal**
Rx Latency	All received component streams of a SureStream group MUST be configured with the **same buffer size** (Rx Latency setting)!
SureStream Diversity Generator	The SureStream Diversity Generator can be set up with three different sets of parameters. These three sets of parameters are different and allow the Diversity Generator creating a variety of different component streams if more than one component stream is configured
Alarms Suppressed	Checking this box, disabled all alarms generated by this IP stream – not influenced by SureStream

Whenever a set of SureStream component streams are created, one of them should have the Diversity Generator Level set to off. All other component streams should run on a different level (I-III).

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5.3 SureStream – Decoder Configuration

Configuring the Decoder for using SureStream follows the normal procedure for creating as many as desired receive streams (component streams).

A SureStream group will be displayed only if the RX Latency settings are equal on all component streams of a group. This is a very important setting and must not be ignored!

On the Decoder section, the Re-Sequencer as the complementary part of the Diversity Generator MUST be enabled!

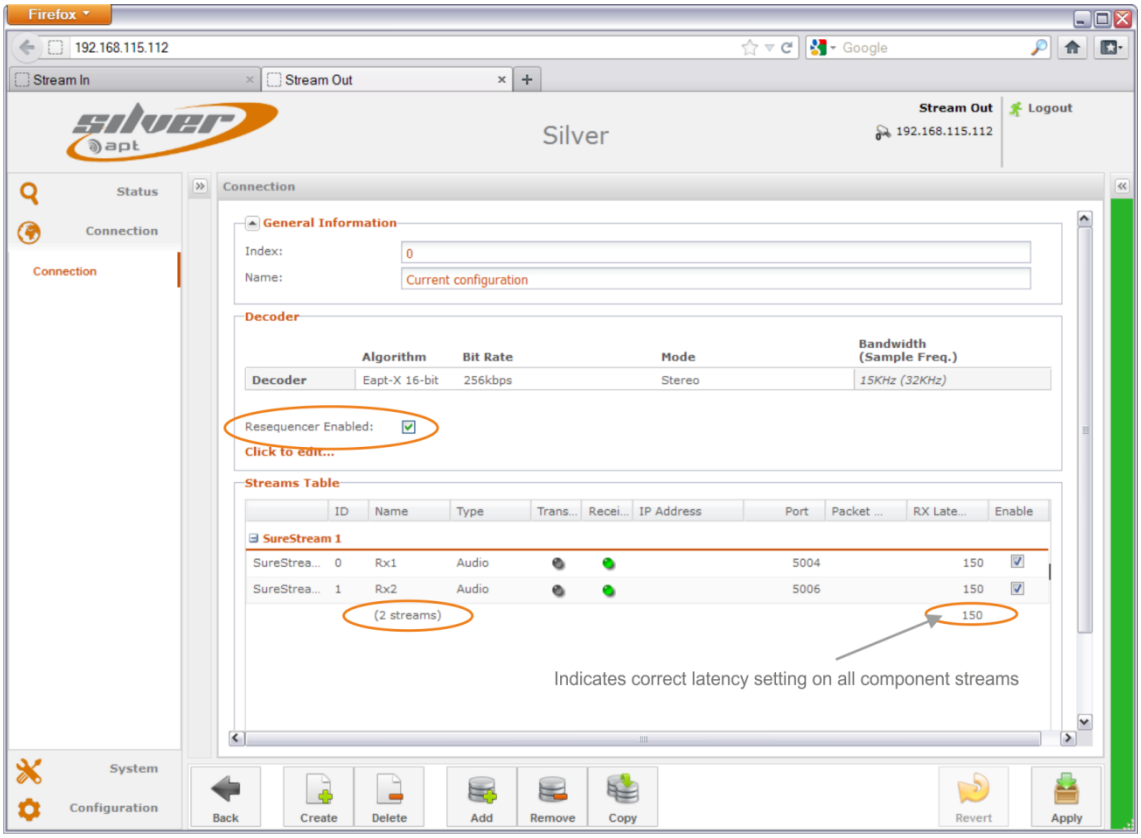

Figure 5-5: Shows a SureStream configuration on the Decoder with two streams received

The figure above shows a working Decoder configuration in principal. Again, two component streams are received on the same ETH port; hence they are transmitted on a single port at the Encoder end (as shown in the Encoder section).

On the Decoder, SureStream needs the Re-Sequencer to be enabled whenever more than one stream must be received from the same Encoder, regardless of the Diversity Generator level settings of the Encoder!

The RX Latency setting must be equal on each component stream of a SureStream group!

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SureStream – Decoder Configuration *(continued)*

SureStream does not offer specific configuration option for creating receive-streams on the Decoder.

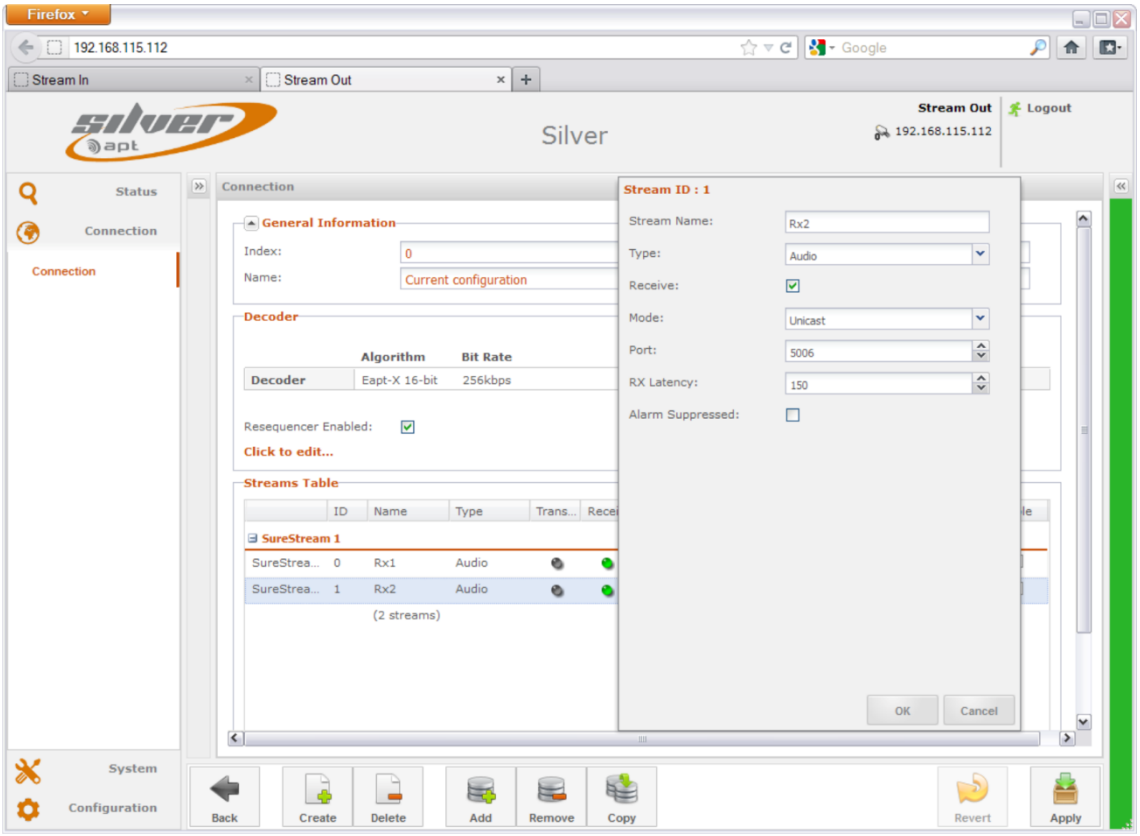

Figure 5-6: Shows the normal Stream configuration window

ⓘ *On the Decoder, SureStream needs the Re-Sequencer to be enabled whenever more than one stream must be received from the same Encoder, regardless of the Diversity Generator level settings of the Encoder!*

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5.3.1 SureStream – Decoder Performance

The performance monitor delivers precise information about the component streams treated by SureStream and the summary performance of the SureStream group.

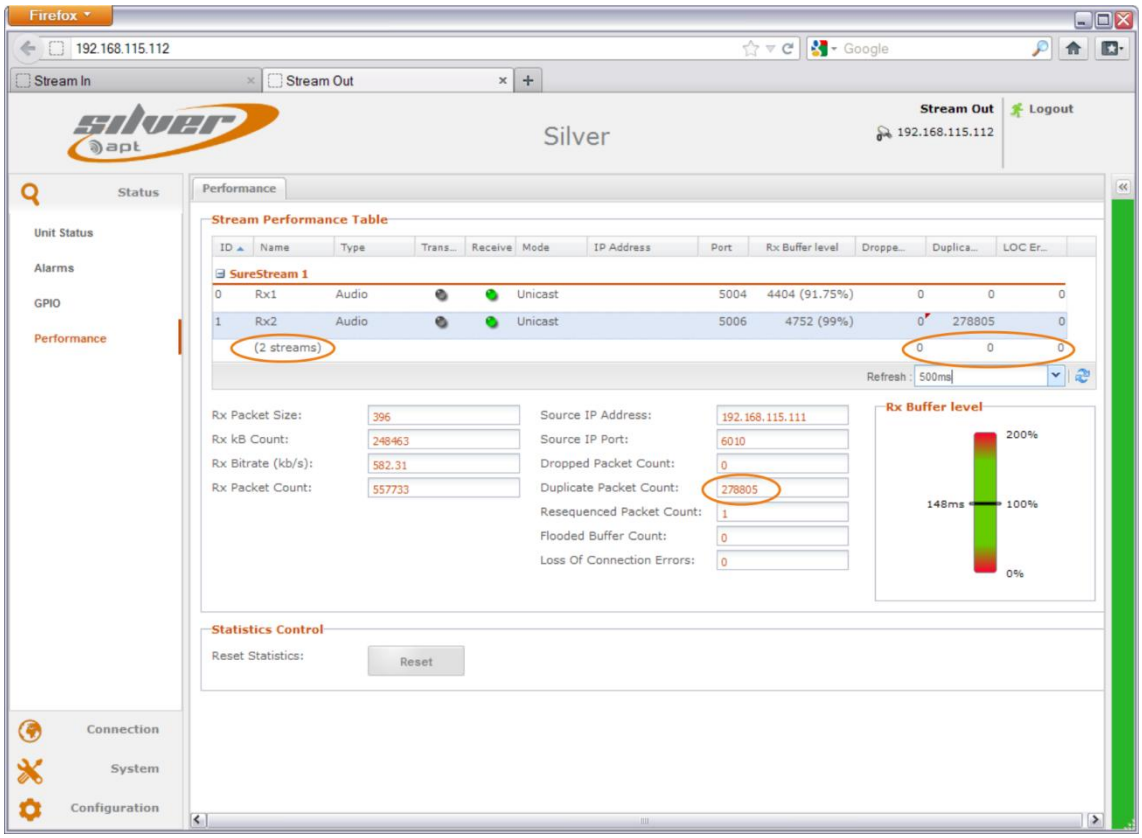

Figure 5-7: Shows the stream performance of component streams and the SureStream group

The figure above shows a perfectly working SureStream configuration on a Decoder. The SureStream group consists of two component streams (Rx1/Rx2). While Rx1 shows no Dropped Packets, no Duplicated Packets and no LOC errors, the Rx2 shows a huge amount of duplicated packets. This is exactly how the Enhanced Re-Sequencer works. It re-combines the component streams and creates an error-free packet streams for decoding and discards all redundant packets.

In a real world environment, the component streams will show lost packets errors.

The statistic below the SureStream group shows the performance of the re-combined stream. If any error (dropped packets) appears on this line, the decoder will be affected and artifacts may be audible. In this case it is worthwhile trying to use another Diversity Layer on the Encoder or, if possible, adding another component stream to the SureStream group.

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6.0 System – Firmware Update

This section is the step-by-step instruction for performing a firmware update successfully. This is a straight forward and intuitive procedure.

A firmware update can be processed on the Admin Account only

6.1 About – System Firmware

A Firmware release consists of a set of inter-compatible firmware files. These are system files for the DSP, the system operational system and the WEB GUI. A system release will be delivered always as a Zip-Archive.

The firmware zip- archive must never be unzipped on a PC. The system upload procedure requests this zipped archive.

6.1.1 Firmware Update – Step 1

Open the "Update Page" on the main menu (System – Update). The following screen will be presented:

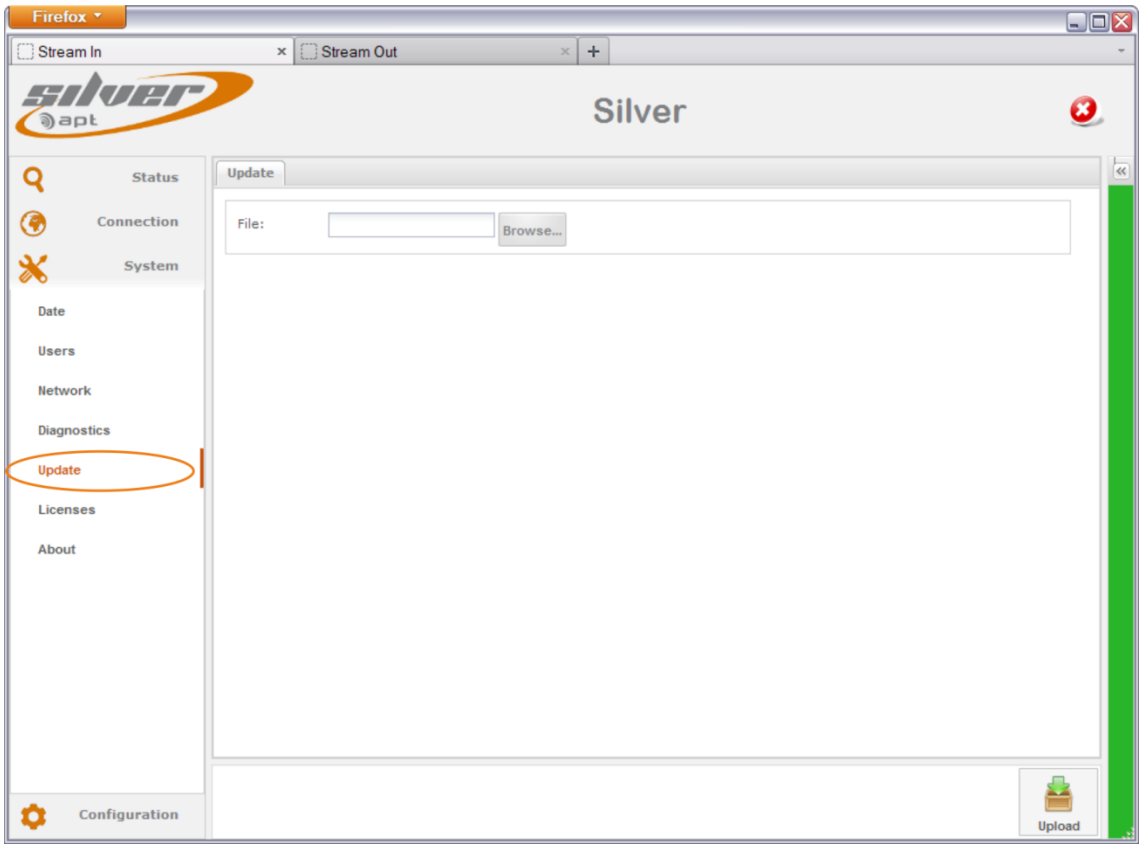

Figure 6-1: Shows the Firmware Update page

It is strongly recommended to read and to follow this step-by-step instruction!

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6.1.2 Firmware Update – Step 2

Clicking on the "Browse" button opens the PC file browser. Navigate to the folder where the firmware file is stored and select the zip-archive (SLVR_SR_x.x.x.zip).

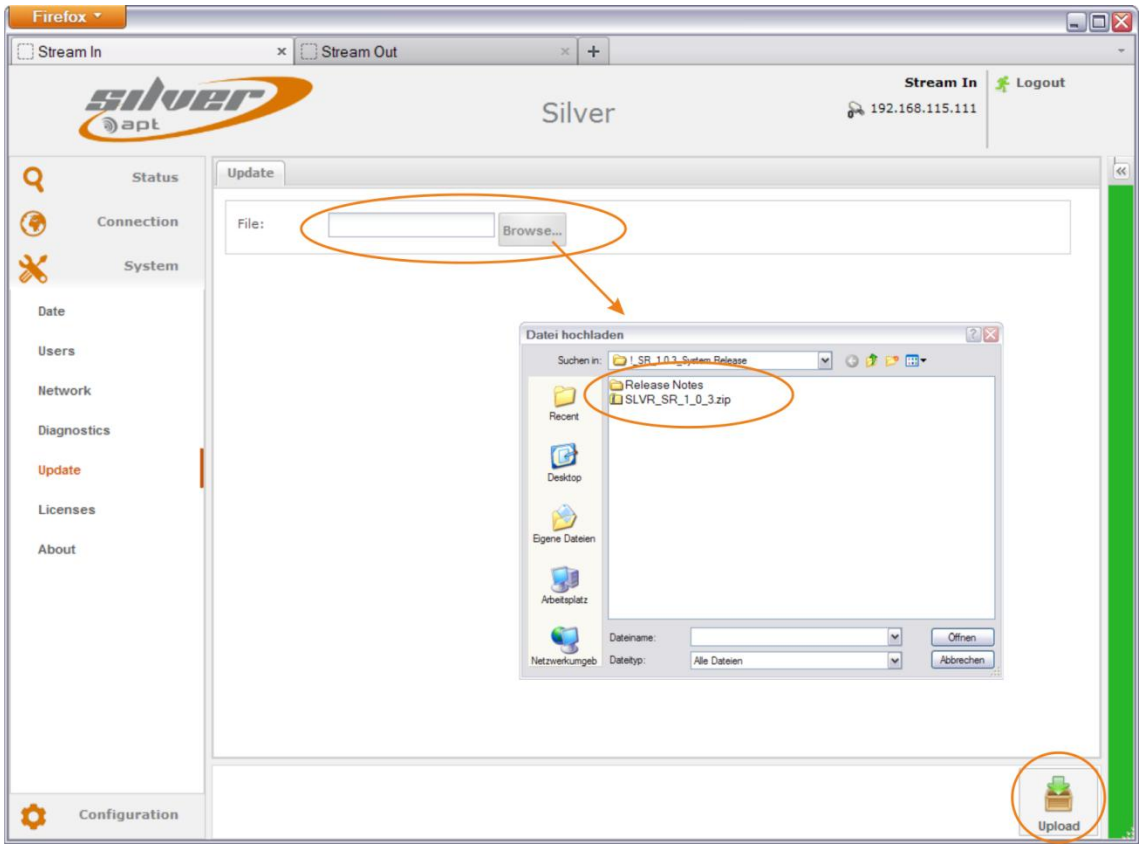

Figure 6-2: Shows the file browser on the firmware update page

Once the correct firmware file was selected and appears in the "File" section click on the "Upload" button on the bottom right corner of the browser window.

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6.1.3 Firmware Update – Step 3

The system prompts you to confirm the firmware upload.

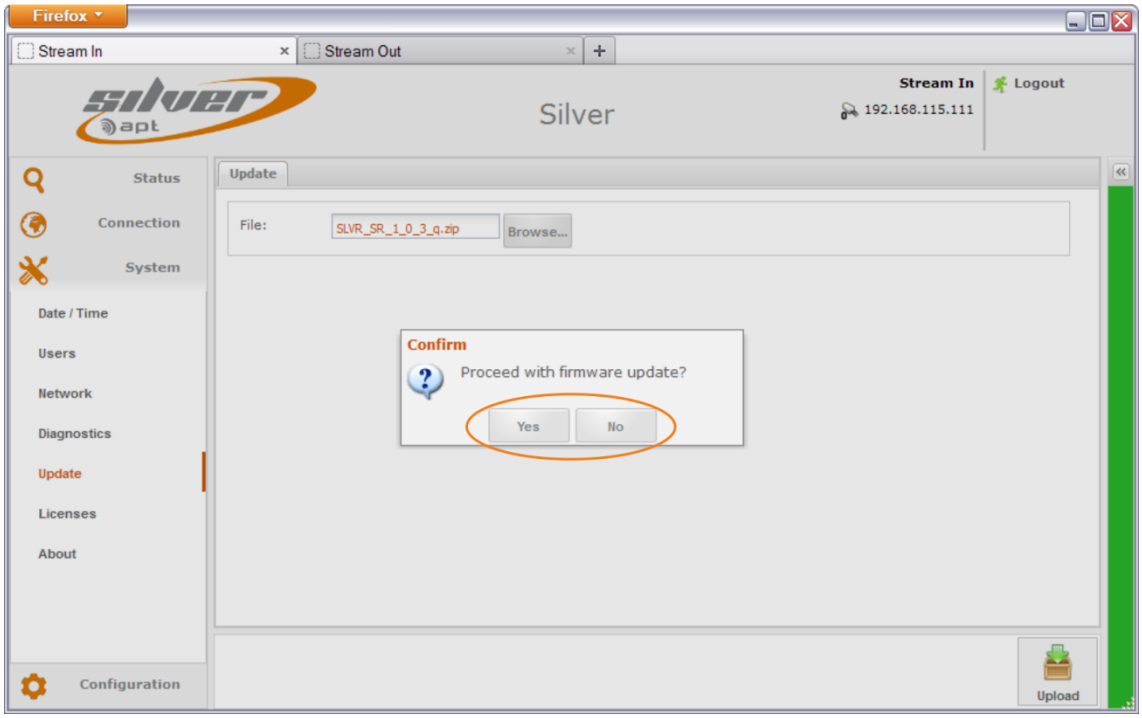

Figure 6-3: The system asks for final confirmation for starting the firmware upload

After clicking on the "Upload" button the System prompts you again to confirm the update process (or to cancel). Once you have confirmed the upload procedure to start – DO NOT DISCONNECT THE UNIT FROM MAINS OR TRY TO RE-START THE UNIT UNTIL THE PROCESS IS COMPLETED!

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6.1.4 Firmware Update – Step 4

During the update the browser shows this screen indicating the update procedure.

During this process you may be prompted by an authentication window on some browsers to enter a user and password (i.e. seen with Firefox); proceed with "Cancel". No authentication is required at this point. Do not enter any user name or password.

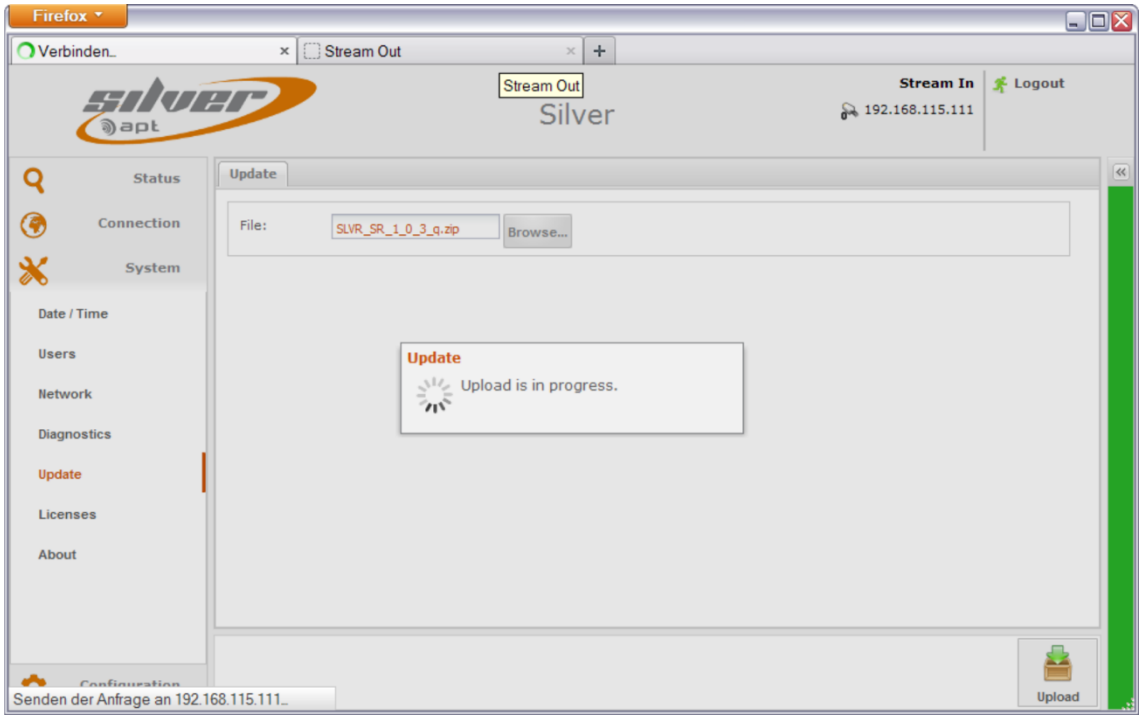

Figure 6-4: This page appears after the upload process was confirmed

The Firmware Upload process stops any actual process on the unit: it discontinue streaming or receiving for approx. 4 minutes.

All profiles and the current configuration are NOT affected from the firmware update.

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6.1.5 Firmware Update – Step 5

The firmware update is a completely hidden process in order to avoid any user interaction. Once you have clicked the "Upload" button the system prompts you to confirm the process. This is the only user action necessary after initializing the update procedure!

- After approximately 20 seconds the browser shows the LogIn page
- The LogIn page is inactive for another 4 minutes
- 4 ½ minutes after initializing the upload process, the unit will allow to log in again. This is the point in time the unit continues to operate in the same way as previously.

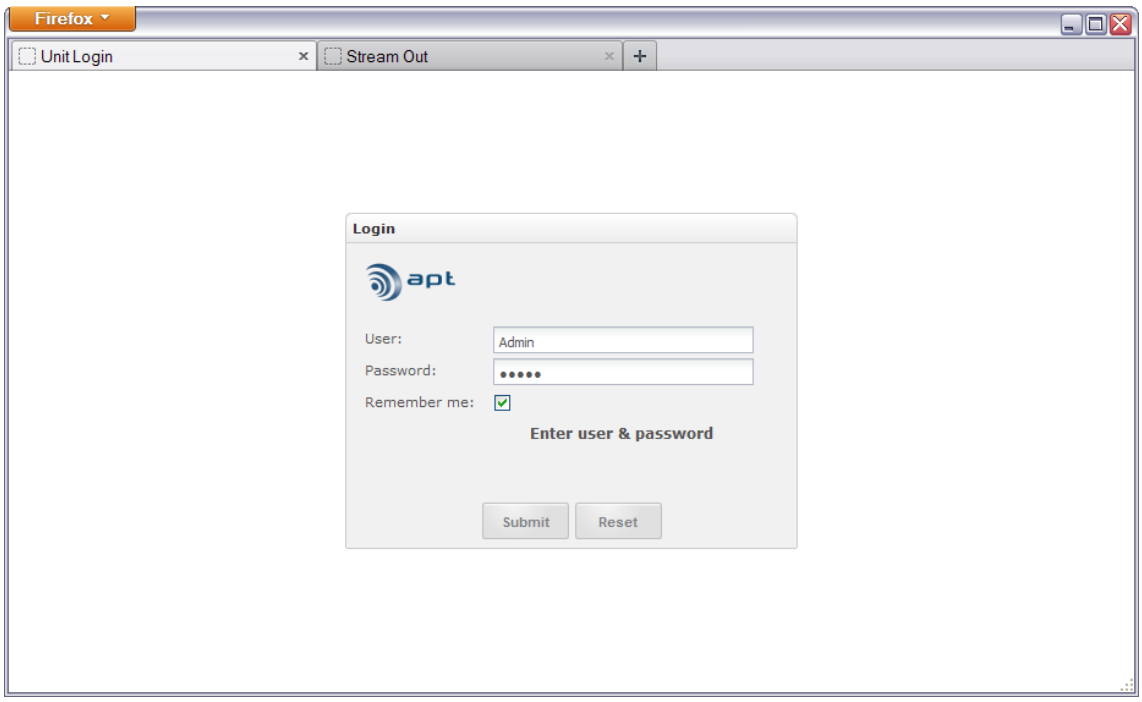

Figure 6-5: This browser switches to the LogIn page after approximately 20 seconds.

It is not necessary to re-start the unit after the update process. All settings will appear as configured. On a live-link, the stream will be re-established automatically. No user action is necessary to re-connect a running system.

Figure 6-6: The "Alarm" LED and the "Connected" LED indicate the running update process

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6.1.6 Firmware Update – Step 6

After completing the firmware update, the Status Page will present the new firmware successfully loaded.

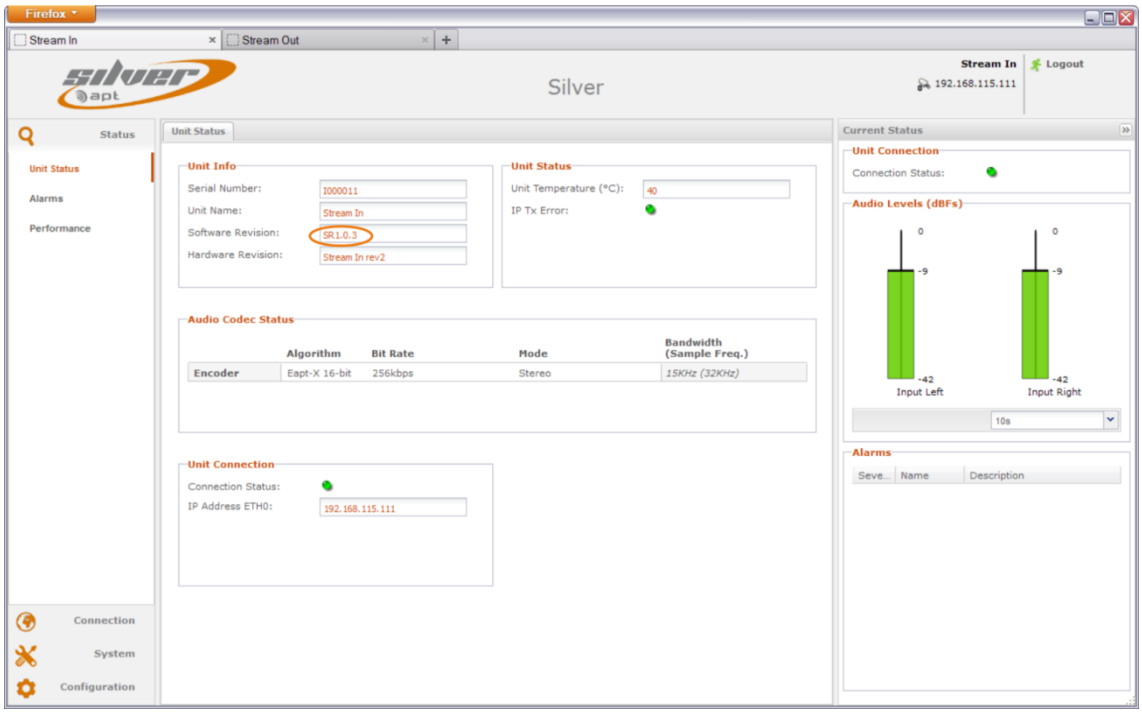

Figure 6-7: Shows the Status Page - System running and new firmware loaded

End of Firmware update procedure

End of Document

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