STL quick start

Getting started with your STL set
SAS250/SIR150

Version: **1.1**
Date: **March 2010**

Revision History

Version	Author	Description	Distrubution
1.0	AC	Initial release of document (November 2009)	Release
1.1	AC	Major update (March 12, 2010) - Added information on Ogg Vorbis. - Added information on Web-interface and config. - Added information on telnet and config.	Release

Important notes

- The SAS250 software released upto the moment when this document was distributed does not support Remote Monitoring and Job scheduler.
- The SAS250 software released upto the moment when this document was distributed does not support streaming of pre-recorded content.
- The web-interface (ChannelService) release upto the moment when this document was distributed does not support Remote Monitoring and Job scheduler for SAS250.

1 Getting Started

1.1 First and foremost…

thank you for purchasing the Streamit Internet Radio (SIR150) and/or Streamit Audio Streamer (SAS250). We greet you as a new user of the Streamit STL products and hope that your new devices will give you many years of pleasure. The SIR150 and SAS250 are modern devices and we strongly recommend you to read the first part of this manual thoroughly, before you start installing and using the device for the first time.

The SIR150 is a fully autonomous working IP-audio receiver, able to tune in to web casts of internet radio stations and audio distributors/encoders (e.g.SAS250).

The SAS250 is a fully autonomous working IP-audio steamer, able to stream audio in Ogg Vorbis format to SIR internet radio devices or to an audio distribution server (Icecast2). The SAS250 in combination with the SIR150 internet radio device is the perfect solution for STL applications.

The SIR150 in combination with the SAS250 audio streamer device is the perfect solution for STL applications.

The STL devices can be configured via the web-interface (default) implemented as part of the ChannelService webservice of Streamit, but also via network interface (Telnet) and the Streamit Terminal Program (STP).

ChannelService (http://channelservice.eu) is a free webservice that helps users to configure and monitor their STL devices, straight out of the box.

STP is a user friendly software application for your Windows PC which is meant for advanced configuring and monitoring of your STL devices. This program can be downloaded from our website free of charge.

The MMC, SD/SDHC card can be used to add Store and Forward capability to the SIR150 devices and also provides for adequate fall back in case of network or streaming failures. On SAS250 devices, the card can be used for streaming pre-recorded content instead of live streaming.

For more information on Streamit products and technologies, we invite you to visit our website http://www.streamit.eu.

Finally, we wish you a lot of pleasure using your STL devices.

Streamit B.V.

1.2 Streamit support

With this manual we have tried to clearly describe the operation of your STL devices. But we can imagine you have a question or come across an issue which is not covered in this manual. In such case, you are welcome to visit our website (http://www.streamit.eu) where you will find up-to-date documentation and the latest software release(s).

When you have purchased your STL device from one of our local dealers, we recommend you contact your dealer first.

1.3 References

[1] STP Installation Guide and User's Manual (STPhelp.chm – The help of Streamit Terminal Program) – 2009, Streamit B.V.
[2] STL Reference Manual – 2010, Streamit B.V.

1.4 Unpacking your STL set

Both the SAS250 and SIR150 are have identical packaging; the content is also identical, except the device itself. Carefully take the device and the supplied materials out of the package. Make sure that all of the following components are included:

- ✓ 1x SIR150 or SAS250 device
- ✓ 1 x 12V power supply with screw-on connector
- ✓ 1 x USB-AB cable
- ✓ 1 x STL Quick start guide

1.5 Back view

The back view of the STL devices is very similar. The differences are the audio input/output connectors.

1.5.1 SIR150 back view

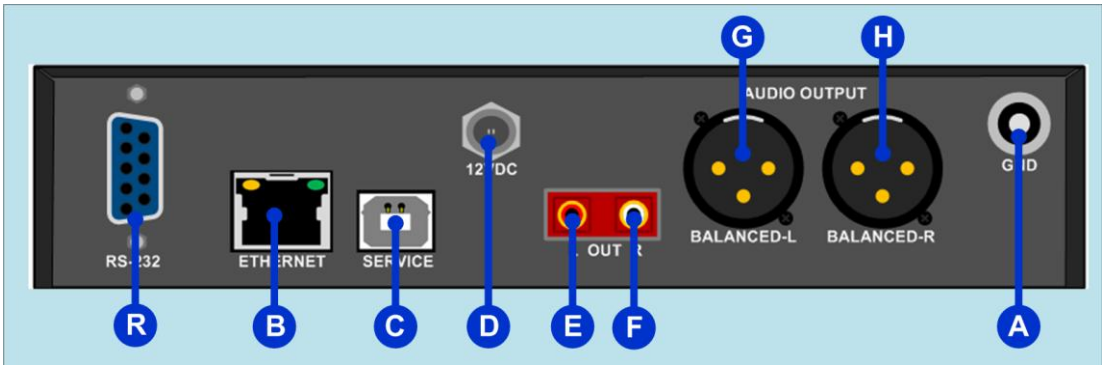


Figure 1.1: SIR150 back view

A – External Protective Earth connector
B – RJ45 Ethernet connector
C – USB connector
D – Screw power supply connector
E – Left RCA audio (cinch) connector
F – Right RCA audio (cinch) connector
G – Balanced left XLR connector
H – Balanced right XLR connector
R – RS232 connector

1.5.2 SAS250 back view

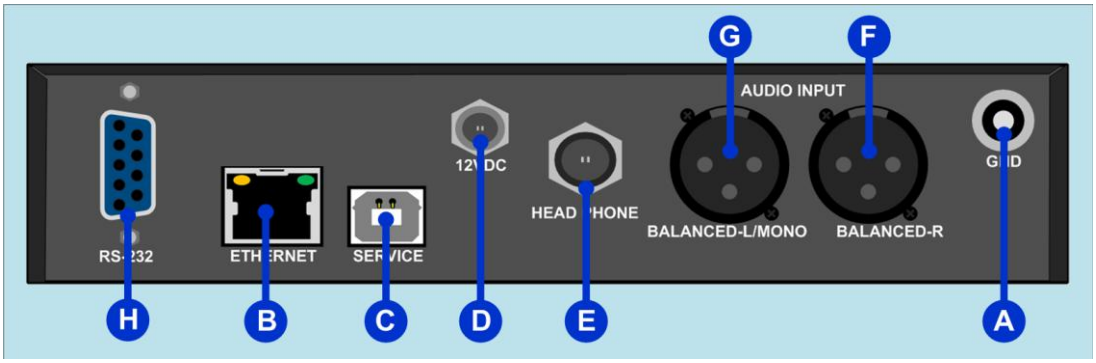


Figure 1.2: SAS250 back view

A – External Protective Earth connector
B – RJ45 Ethernet connector
C – USB connector
D – Screw power supply connector
E – 6,3 mm headphone connector
F – Balanced right XLR connector
G – Balanced left XLR connector
H – RS232 connector

1.6 Front View

The front view of the STL devices is identical. The only difference is the product type text (N).

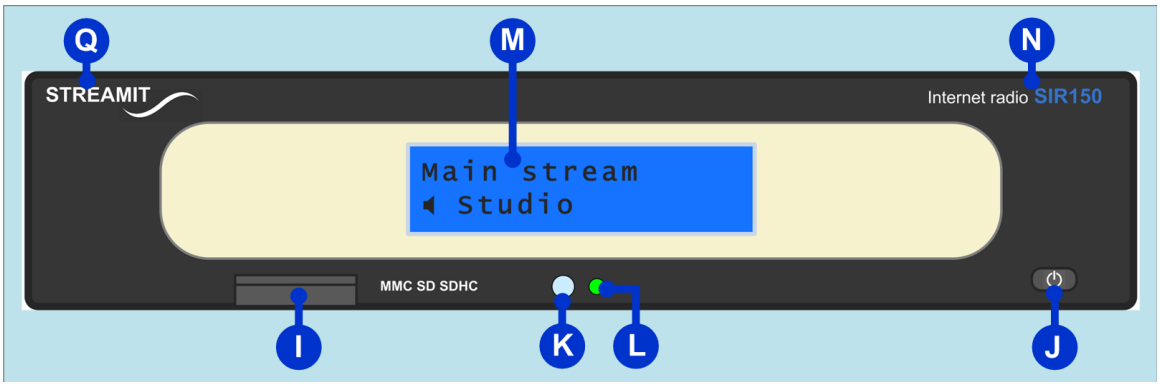


Figure 1.3: STL device front view

I – MMC/SD/SDHC card slot
J – Power on/off button
K – Infrared receiver indicator
L – Status indicator
M – 2x16 characters LCD display
N – Product type
Q – Streamit logo

1.7 Bottom View

The bottom view of the STL devices is identical. The only difference is the product type indicated on the product sticker.

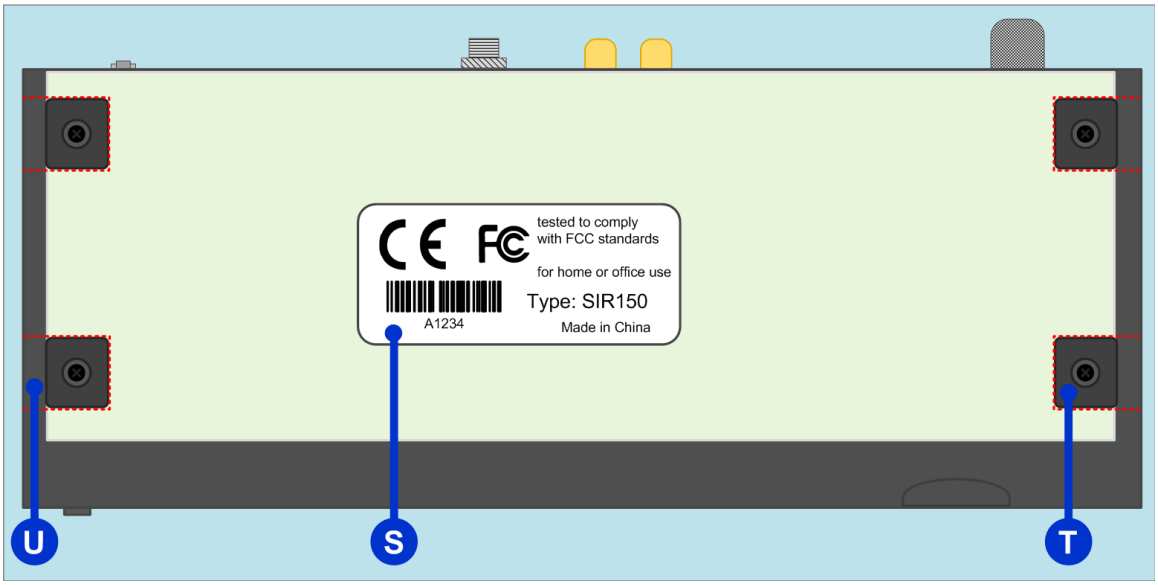


Figure 1.4: SIR150 bottom view

S – Product sticker
T – 4 x rubber feet
U – 4 x chassis mount openings

2 Installation

This section of the manual will cover the installation of your STL devices starting from how to mount and connect your device, to configuration.

2.1 Rack mount

Inspired by the professional audio market, STL devices are designed to give you the option to easily mount in conventional 19 inch (1inch = 2,54cm) racks. For rack mounting, the rack-mounting kit is required. This kit can be ordered from Streamit or official Streamit dealers and contains 5 mounting plates in total as shown below in *Figure 2.1*. Using a combination of these plates, it is possible to mount either one or two SIR radios in a 19" rack.

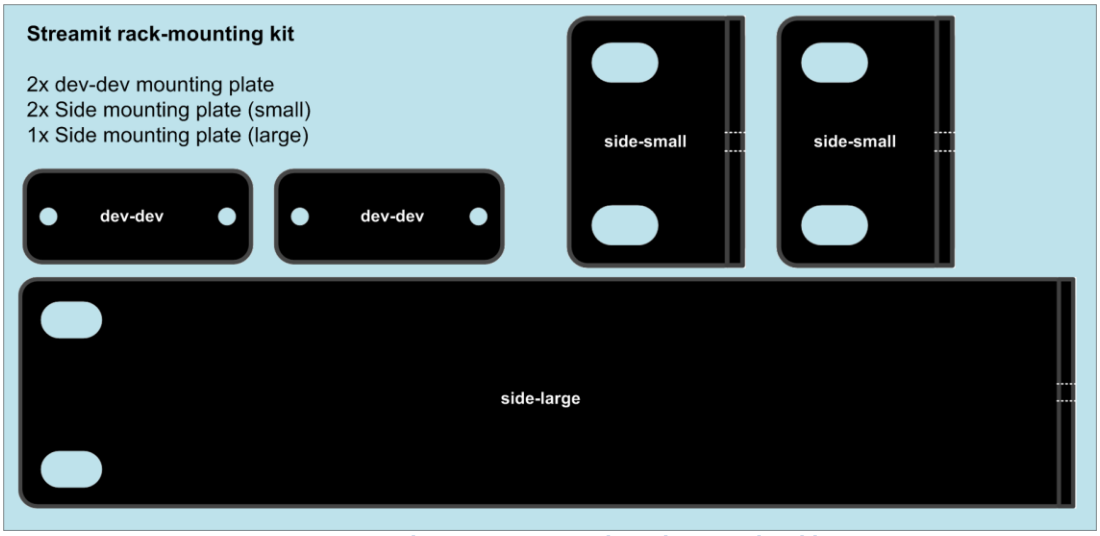


Figure 2.1: Streamit rack mounting kit

2.1.1 Mounting a single STL device in a 19 inch rack

To mount a single SIR150 or SAS250 device in an 19'' rack, you make use of the large side mounting plate and one of the small side mounting plates. At each side of the device, there are two screws and two small slot-looking openings. Start with one side of your device and remove the Phillips-head screws using an appropriate screwdriver. Place the large side mounting plate as shown below in *Figure 2.2*. You will see that the holes of the mount plate will match those of the device. Carefully fasten the screws back on to bind the device together with the mounting plate. The same is done for the other side, but in this case one of the small side mounting plates is used.

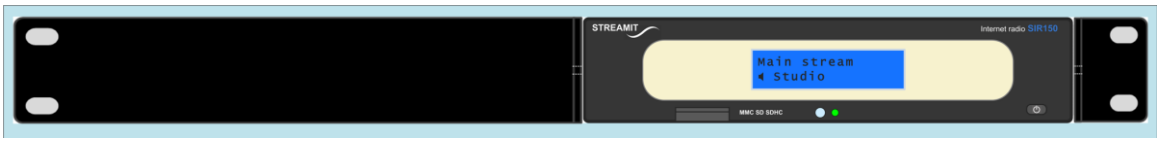


Figure 2.2: STL device in rack mount configuration

At this point you can mount the whole setup in the rack by bolting the sides to the frame of the rack. In most cases though, we recommend that the device is first connected and then mounted, for the simple reason that all connections of the SIR are located on the back and once mounted the SIR will not be as easy to access. Connecting the device is described in the following chapter.

2.1.2 Mounting two STL devices in a 19 inch rack

Mounting two STL devices in a 19'' rack requires using the two dev-dev mounting plates and the two small side mounting plates. Mounting the side plates is done in the same way as when mounting a

single device (see § 2.1.1 above). You just have to make sure that the plates are oriented outwardly as shown below in *Figure 2.4*. Once this is done, you connect the two devices together using the dev-dev mounting plates. Turn the first device over. You will see it has four Phillips-head screws with black rubber feet, two for each side. Using an appropriate screwdriver, remove the two feet on the opposite side to the side mounting plate. The openings on the side now form slots with the same width as the dev-dev mounting plates and half the length of the dev-dev mounting plates. Fit the dev-dev mounting plates in the slots and you will see its holes matching with the device's. Carefully screw the rubber feet back on.

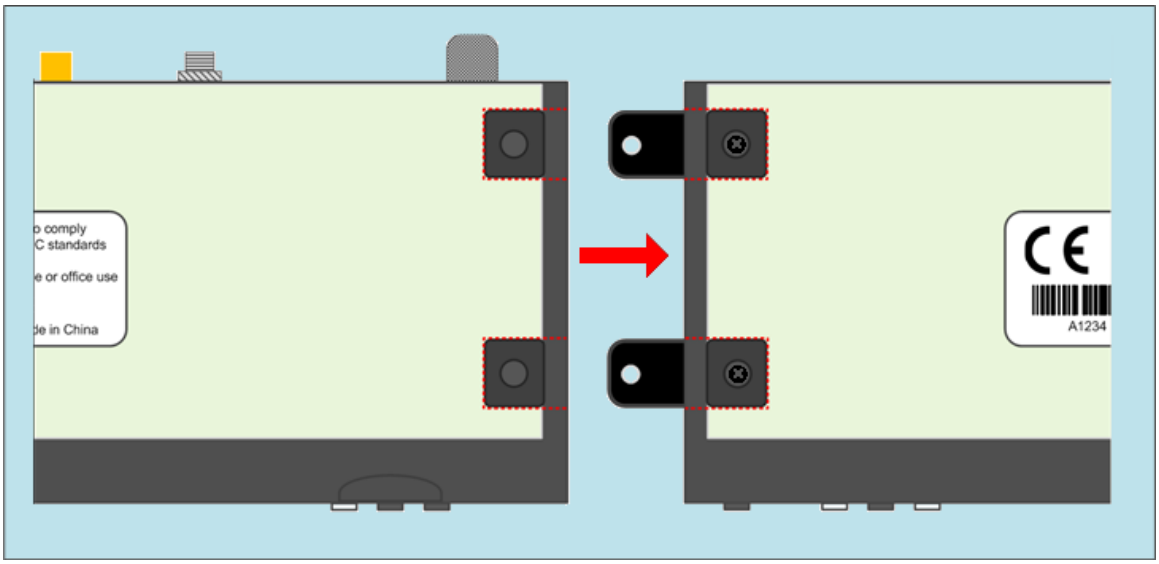


Figure 2.3: Connecting two devices together

Now take the second device and remove the rubber feet just like you did with the first one, then connect the two devices together by screwing the rubber feet of the second device back on (see *Figure 2.3)*. When properly done, the resulting setup will look same as the one shown below.

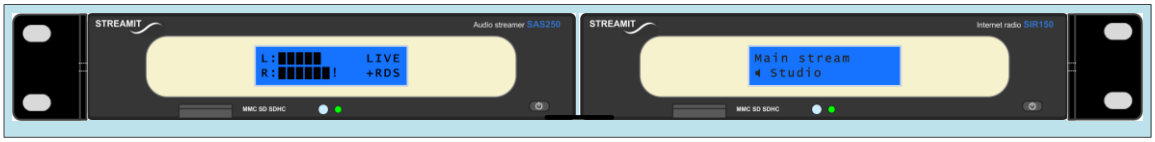


Figure 2.4: Two STL devices in rack mount configuration

At this point you can mount the whole setup in the rack by bolting the sides to the frame of the rack. In most cases though, we recommend that the device is first connected and then mounted, for the simple reason that all connections of the STL devices are located in the back and once mounted, the device will not be as easy to access. Connecting the device is described in the following chapter.

2.2 Table Mount

When used in an office environment the STL device could be placed on your office desk, next to your PC, while in a professional environment your STL device would typically be mounted in a rack.

2.3 Connecting your STL device

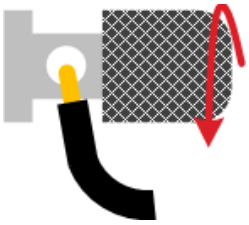
Regardless of where you use your STL device and how it is mounted, it is important that you connect it properly.

2.3.1 Connecting the Protective Earth

The STL devices feature an external Protective Earth (PE) connector. This connection ensures that all exposed conductive surfaces are at the same electrical potential as the surface of the Earth, to avoid the risk of electrical shock if a person touches a device in which an insulation fault has occurred.

In an office environment, you would normally connect the PE to the chassis of your desktop computer.

Normally all devices mounted in a rack have the PE (when applicable) connected to the frame of the whole setup. When this scenario applies to you, simply connect the PE connector of the STL device to the frame of your setup with a conductive wire. The following steps are followed:



- Unscrew the connectors head until you see the complete hole in the connector.
- Put the stripped part of the conductive wire in the hole.
- Screw the connector head back on. Make sure that the wire is fixed.
- Connect the other side of the wire to the chassis of your computer or the frame of the rack.
- You could use a DMM (digital multi-meter) to verify that there is indeed connection between the chassis (rack) and your STL device.

You are not obliged to make this connection. This is an optional connection intended for extra protection, especially when the device is mounted together with other expensive equipment.

2.3.2 Connecting the Power supply

Plug the power adaptor to the mains outlet (230V~50/60Hz) and then screw the connector on to you STL device. In the process we ask that you careful attention to the following instructions:

Never use wet hands when plugging the power adapter in the mains and never remove the power adapter from the mains with wet hands.

Do not cut or damage the cord of the power adapter; do not place heavy objects on the cord. This can cause short-circuit, resulting in electrical shocks or fire.

Pulling the cord can also damage the wire and/or isolation causing electrical shocks or fire.

Using power adapters other than the one recommended for your STL device, can result in overheating and damage you device. This can cause fire, electrical shocks and other hazards. Only use the supplied power adapter.

Applying your STL device to situations with rapid changing temperatures can result in condensation (small amount of water) on the inner and outer surface of your device. To ensure a long lifetime of your STL device, this should be prevented. In case of such a scenario, wait until you device is ‘dry’ before you use it again.

2.3.3 Connecting the Ethernet cable

Use the provided Ethernet cable to connect your STL device with your cable modem, ADSL modem or router. If everything is ok (and the power supply has also been connected) the yellow LED of the Ethernet connector will light-up yellow continuously while being connected. The green led will blink randomly.

2.3.4 Connecting the audio input (SAS250)

The audio input of your SAS250 device will be connected to the Line output of your audio installation, using XLR audio cables with male connectors. No audio cables are included with your SAS250.

2.3.5 Connecting the audio output (SIR150)

The audio output of your SIR150 internet radio device will be connected to the Line input of a HiFi amplifier or some audio installation, using XLR audio cables with female connectors.
No audio cables are included with your SIR150.

2.3.6 Connecting the headphones (SAS250)

To listen to the input signal of the SAS250 a headphone with 6,3 mm connector can be connected. The audio is only available while the SAS250 is streaming.

2.3.7 Connecting the RDS connector

For RDS applications, a DB9 serial cross-cable (male connector) is used to connect the SAS250 and/or SIR150 to the module writing/reading RDS information.

2.3.8 Connecting the USB service cable

The USB connection is used for service purposes, which include programming your device, software update, and monitoring of the communication between the STL device and the internet. The B-connector of the USB cable is plugged in the device, while the A-connector connects to your Windows PC. Before making this connection we recommend that the Streamit Terminal Program is first installed. For more information on STP, including installation and user manual, please see [1].

3 Basic knowledge

Streamit's STL solution is based on the SAS250/SIR150 set.
On the transmit site, the SAS250; an Ogg Vorbis audio streamer device, is installed. The SAS250 encodes the audio input into Ogg Vorbis and sends it over the internet to the receiver.

On the receive site, theSIR150 internet radio device is installed. The SIR150 is capable of playing Ogg Vorbis streams (as well as mp3, wma and aac(+)).

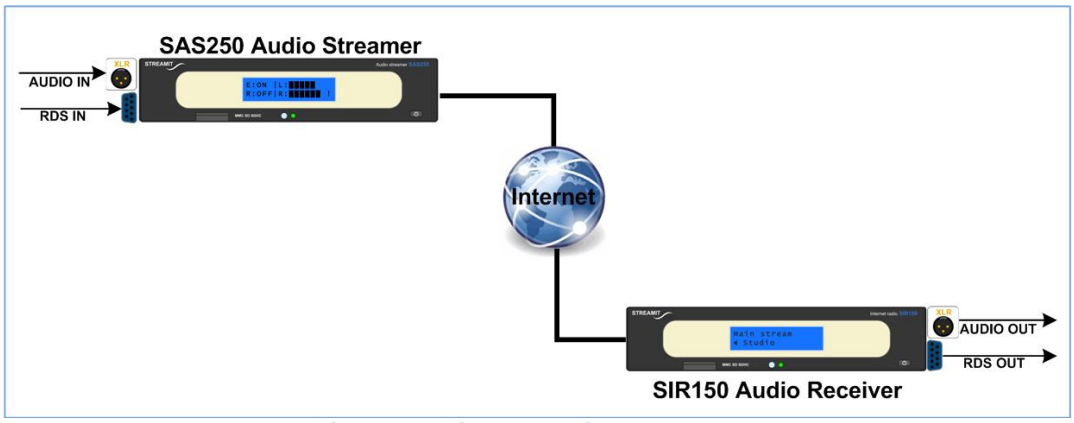


Figure 3.1: The SAS250/SIR150 STL set

As shown in the figure above, besides the audio data it is also possible to send RDS information from the SAS250 to the SIR150.

3.1 Ogg Vorbis

Ogg Vorbis is a completely open, patent-free, professional audio encoding and streaming technology with all the benefits of Open Source. Ogg Vorbis is a new audio compression format. It is roughly comparable to other formats used to store and play digital music, such as MP3, AAC, and other digital audio formats. It is different from these other formats because it is completely free, open, and unpatented.

The Vorbis audio codec is most commonly used in conjunction with the Ogg container format and it is therefore often referred to as Ogg Vorbis. Vorbis is a lossy codec just like MP3, but sounds better than MP3.

Ogg Vorbis has been designed to completely replace all proprietary, patented audio formats.

3.2 Information about audio codec/quality

One of the main requirements for STL applications is low audio latency. The audio latency is related to the used codec as well as the codec quality setting (which for Ogg Vorbis are called profiles) as well as buffer management.

To achieve the lowest latency the highest quality profile was used on the SAS250. The delay achieved when using this profile is around 3 seconds. For more specifications see table below:

Codec	Vorbis
Profile	Stereo music
Channels	2 (Stereo)
Bitrate	~135kbps VBR[1]
Samplerate	44100Hz

For more information about Ogg Vorbis and comparison with other commonly used formats, please take a look at the following document http://www.streamit.eu/downloads/OggVorbis.pdf.

[1] Variable Bitrate: VBR tries to keep quality constant. As a result the bit-rate will change depending on how difficult a particular portion of music is to encode.

3.3 The RDS serial interface

To interface with the SAS250/SIR150 for the RDS application, the following settings should be used for the serial port:

Baud-rate	1200/9600[2]
Data size	8
Parity	None
Handshake	OFF

When RDS is enabled, you can configure the baud-rate on SAS250 side. The two possible options are 1200 baud and 9600 baud. The other settings are fixed and described on the table above. On the SIR150 side, RDS parameters do not need to be configured. The configurations will be exactly the same as that of the SAS250 and are communicated from the SAS250 during the connection phase.

3.4 Device configuration

There are three ways of configuring your STL devices.

- From the web-interface
- Via a telnet client
- Using the Streamit Terminal Program (STP)

The recommended configuration interface for the STL devices is the web-interface; implemented as part of the ChannelService webservice of Streamit. In this document, ChannelService and web-interface will be used interchangeably. By default, all Streamit devices will get their configuration from ChannelService.

3.5 ChannelService, the web-interface for STL devices

ChannelService (http://channelservice.eu) is a free webservice that helps users to configure and monitor their SIR internet radio devices and SAS audio streamer devices, straight out of the box.

ChannelService is the web-interface for STL devices. The figure below shows how ChannelService is used in combination with STL devices.

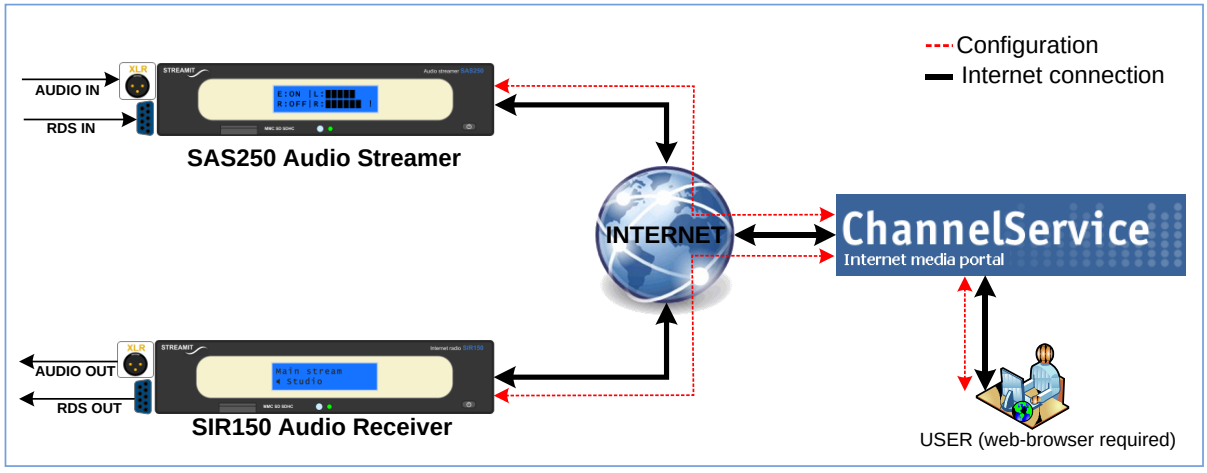


Figure 3.2: The web-interface

As you can see, the web-interface is not integrated in the device; it is a remote web interface. There is no "direct" communication between the user and the device, everything goes via ChannelService. Such a web-interface has a number of advantages, which are explained in the next section.

[2] The baud-rate used must be the same as the baud-rate configured on the respective device.

3.5.1 Why a remote web interface

ChannelService is a remote web-interface for STL devices; it is not integrated in the device. This solution has a number of advantages with comparison to having an integrated web-interface.

- You can always access ChannelService, from everywhere in the world without the need to know any (IP) information about the STL device.
- Because ChannelService is in fact a website, it is easier to implement special functionality (e..g. Job scheduling and Remote Monitoring), compared to implementation on an embedded device with limited resources.
- There is much more freedom and resources for implementing a good Graphical User Interface (GUI) on a website.

3.5.2 Restrictions of the web interface

The only restriction of the web-interface (ChannelService) is that it is not possible to configure the IP settings of the device. This restriction was introduced to avoid the situations when wrong IP settings are configured in the device. Wrong IP settings would result in the device not being able to communicate with the web-interface anymore which would require someone to go on-site and fix it.

By default, the STL devices will be using DHCP mode. When the network where the device is installed supports DHCP then the STL devices will get their IP settings from the DHCP server. Correct IP settings will allow the device to communicate with the web-interface (ChannelService).

Note that the SAS250 needs to be configured in fixed network settings mode for the SIR150 to be able to (always) find it. To configure (fixed) network settings to your STL devices the Streamit Terminal Program (STP) is used (see §4.3).

3.5.3 Job Scheduling and Remote Monitoring

In addition to device configuration, the web-interface also features support for remote monitoring and job scheduling of the STL devices; both very powerful features.

With remote monitoring, you get status messages from the devices every “in-minutes-configurable” interval. These messages are saved and made available on ChannelService as log reports. With the information contained in these logs, you get a clear picture of what the device is busy with. More details on Remote Monitoring is available in the STL Reference Manual.

Using the job scheduler, a device can be instructed to carry out tasks at specific moments in time, for example you can tell a SIR150 device to start playing the live stream from the SAS250 at 08:00 in the morning and at 13:00 in the afternoon switch to another stream or card, power off etc. A complete description of the Job Scheduler and list of scheduler commands is available in the STL Reference Manual.

Please, note that the SAS250 software released upto the moment when this document was distributed does not support Remote Monitoring and Job scheduler.

3.5.4 Device configuration from web interface

The web-interface allows you to configure and reconfigure the device without the need to be next to the device or have the IP settings of devices at hand. All you need to do is change the settings on the web-interface; the settings are then communicated to the device. This procedure is known as database update.

3.5.4.1 When does database update occur

When the device is configured to work with the web interface (which by default it is), the database update procedure occurs under these conditions:

- At startup
- From job scheduler
- Forced from ChannelService

When the device is configured to work with the web interface (which by default it is), every time the device is powered on it will perform a database update. The same is valid when the device is restarted.

When the Job scheduler feature is used, you can schedule a database update task to be carried out at a certain moment in time by the device.

It is also possible to force the device to perform a database update, or in other words push the settings to the device from ChannelService. For this feature, it is required that monitoring is enabled, in which case you are given the option to push the settings to the device. The maximal delay between applying the settings on the web-interface and the settings being configured in the device is the monitoring interval (in minutes). When the device connects to the web-interface for monitoring, ChannelService will ask the device to perform a database update.

3.6 How does the STL set work

The STL setup works with point to point streaming, audio and optionally RDS information is sent from the SAS250 to the SIR150.

On the transmit site, the SAS250 encodes the audio input into an Ogg Vorbis stream. To listen to the SAS250 generated stream (on the SIR150), this is configured as a station preset in the SIR150. The URL address of the station will be the IP address of the SAS, followed by the audio communication port. So, when your SAS250 would have the IP address 192.168.10.201 and you have configured the communication port on the SAS250 to be 8000, then the station URL http://192.168.10.201:8000.

On the SAS250, the RDS port is derived from the audio port configuration (audio port + 1). When the SIR device connects to it, the SAS communicates the RDS port to the SIR device. The SIR derives from this information the RDS URL (e.g. http://192.168.10.201:8001).

When the SAS250 is on, it will wait for a (SIR) device to connect to it.

When the SIR device is to play the STL station, it will first connect to the audio stream. When the connection succeeds, the SAS250 will start to encode the audio into Ogg Vorbis and send it over to the SIR device which plays the audio. Once the audio connection succeeds, the RDS connection will be set (when enabled). From this moment, the data applied to the serial port on the SAS250 will be sent over and received by the SIR150; which makes these data available on its serial port.

In the example mentioned above, the devices are in the same network. When devices are not on the same network, you have to configure the network on the SAS side as follows:

- Port forwarding should be used to forward the return traffic coming from the SIR150 properly (audio and RDS).
- When a firewall is present, it should be configured to accept incoming traffic on the respective ports.

3.7 Stations on ChannelService

Any registered user can create music/radio stations on ChannelService. When you create a station, you can choose whether the station will be available for other users or just for you (and your devices). In ChannelService these are called respectively public and private stations.

- A private station will only be available for you to use for your devices. Private stations are automatically added in list of your Favorite stations.
- A public station will be available to all users an ChannelService. A stations will only become public after they are approved. Public stations you create are also automatically added in list of your Favorite stations.

3.7.1 Automatic updating stations

When you register a SAS250 device on ChannelService, ChannelService will automatically generate a radio station for this particular device. This automatically generated station will be a “private” station.

ChannelService uses the IP address of the SAS250 in combination with the device’s stream settings to create the stream for this station. The automatically generated station will be “invalid” (IP address of the SAS250 is not known at this stage and ChannelService just fills it with zeros) until the first database update of the SAS250 device.

When the SAS250 performs a database update, ChannelService will indentify the device, and automatically update the stream (URL) of this station.

Automatic update of the stream is not only limited to the first configuration. Every time the SAS250 performs a database update, ChannelService will check whether there is any change in the IP address and automatically update the station when required. This is also very useful when the SAS250 is moved from one network to another, in which case you are only required to configure the particular device for the “new” network.

3.7.2 Creating stations manually

For STL application, the automatic updating station is a very nice feature. The IP address of the SAS used for deriving the stream URL is the external IP address of the network where the SAS is located. We can think of a few scenario when this might not be desired. E.g. when both SAS and SIR devices are on the same network, using local IP addresses would require no special configuration of the network.

in this case you can always (manually) create a station on ChannelService. This will be a “static” station, which does not update automatically. Every time the IP address of the SAS would change, you would have to edit the station on ChannelService.

To create a station in, go to Stations and click the “Create a new station” link.

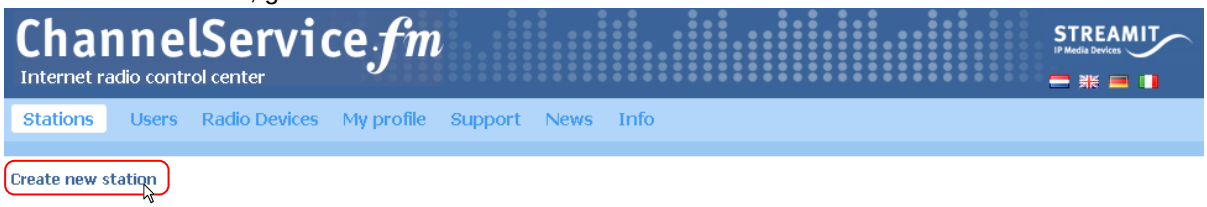


Figure 3.3: Manually create a new station

When creating the station, you will have to fill in the stream URL. When your SAS250 would have the IP address 123.4.56.78 and you have configured the communication port on the SAS250 to be 8000, then the station URL would be http://123.4.56.78:8000.

Once you have added the station as a private station, you can assign it to as a preset to your SIR150 device.

4 Configuring your STL set

There are three ways of configuring your STL devices.
- From the web-interface
- Via a telnet client
- Using the Streamit Terminal Program (STP)

In the rest of this chapter, each of the configuration interfaces will be described.

4.1 Configuration via web-interface

Using the web-interface is the recommended interface for configuring your STL devices. When the web interface is used, you configure the settings of the device on ChannelService. These settings are then communicated to the device during the database update procedure.

4.1.1 When to use the web-interface

Most of the times, the web-interface will be all you need to configure your STL devices. Depending on your application though, this might not always be possible. To be able to use the web-interface the following is required:
- Internet connection for both STL devices.
- Internet enabled computer with web browser for configuration.

When the conditions above are not met, then you should use one of the other configuration interfaces.

4.1.2 Getting started with ChannelService

To get started with ChannelService you are required to create an account. This is very easy and free. Once you have an account, you can manage your encoder (SAS250) and decoder (SIR150) devices from ChannelService.

4.1.3 Configure STL set with the web-interface for the first time

To configuring your STL set for the first time from the web interface, you need to follow these steps:
- Register the SAS250 encoder under your account in ChannelService.
- Register SIR150 device under your account in ChannelService.
- Assign SAS250 stream as a station preset to you SIR150.

4.1.3.1 Registering the SAS250 device

To add a SAS250 device on ChannelService, go to the Encoder devices page (“Radio Devices → Encoder devices”). In this page you will see an overview of all of your encoder devices. To add a new SAS250 device click the link “Add new encoder device”.

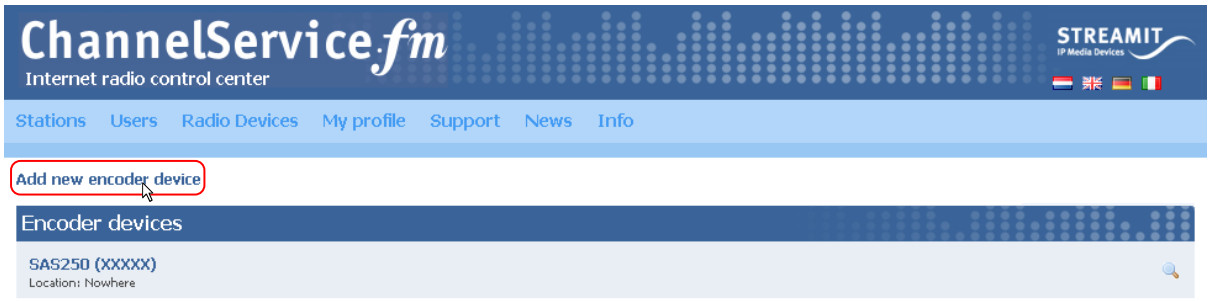


Figure 4.1: Add new encoder de device link

The device configuration form will be shown. The device configuration form is made of two main tabs; General settings and Preset.

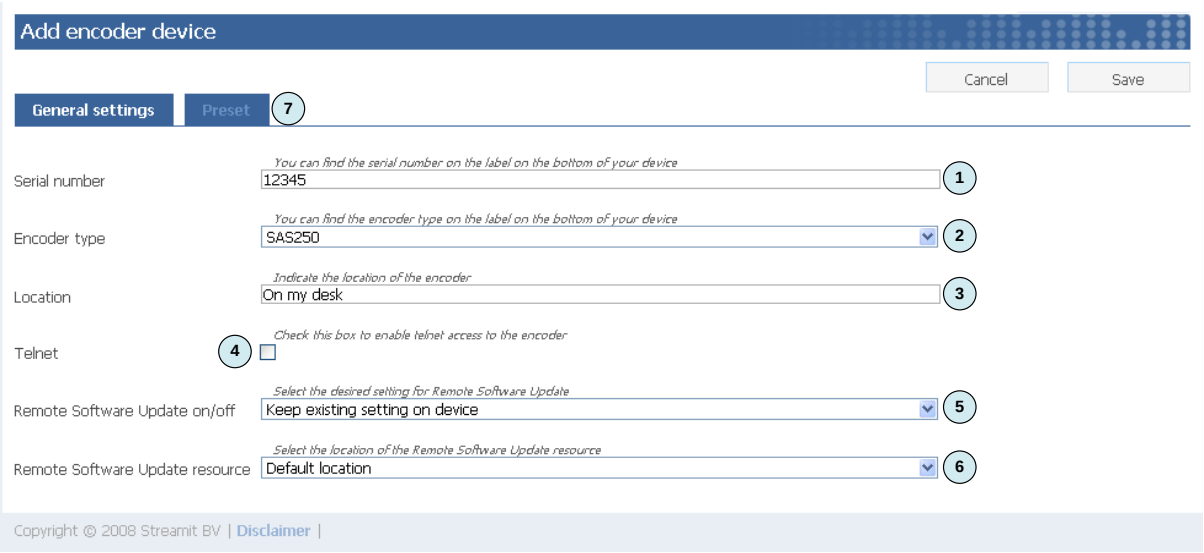


Figure 4.2: Register SAS250 device

In the General settings form, enter the serial number of the device (1, serial number is found on the sticker located on the bottom of the device) and select the correct type (2, SAS250). Fill in the rest of the form as required.

4 When using the web-interface, there is no need to enable the telnet interface. Should you have a reason to enable telnet, please keep in mind that there is no (password) protection; the device will always accept any incoming telnet connections (maximum one concurrent connection).

5 It is possible to Enable or Disable the remote software update (RSU) feature of the device, or to keep the existing settings already configured on the device.

6 The default location for software update is Streamit's update server, but it is also possible to select a custom location.

When you have filled the general settings part click Preset (7) to continue with the configuration of the settings related to the audio encoding process itself.

In the Preset configuration form, you at get the Action (8) dropdown. As you want to configure the device, leave this option as it is “Change settings on device”, and continue with filling in the rest of the device’s configuration form.

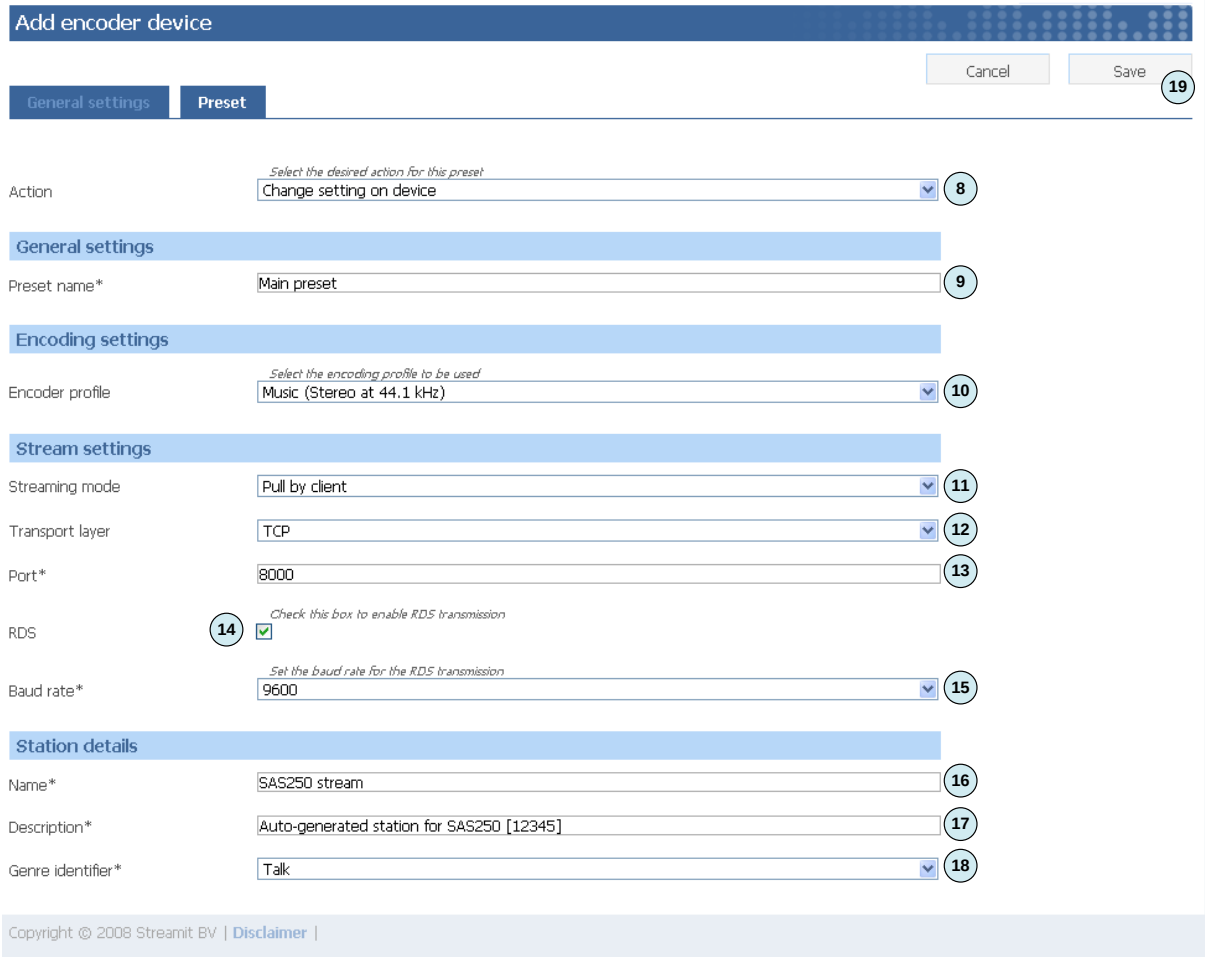


Figure 4.3: Register SAS250 device – Presets tab

As explained in §3.2, the STL set is optimized for low delay, which is achieved when the music profile is used. This is the reason why the music profile is the only choice for SAS250 (10).

The STL setup works with point to point streaming; the SAS250 acts as a server while the SIR150 is the client which pulls the audio stream. This also defines the streaming mode to be used (11, Pull by client). Streaming is done over TCP (12).

13 The port setting defines the port to be used for the audio communication. This in return also automatically defines the port used for RDS communication (when applicable); RDS port is one higher than the audio port.

14 Depending on your application, you can enable/disable RDS. When RDS is enabled, you should choose the baud rate of the RDS (15) connection between your STL devices and the RDS input/output system.

In the section “Station details” you enter information about the SAS250 stream. This information is used for the station that is about to be generated on ChannelService.

19 Click the “Save” button to apply the changes.

When you save your SAS250 device configuration, a station is automatically generated and added as a “private” station (the station name will be the one entered in “Name” field under Station details).

To play this station on your SIR150 device, the station is assigned as a preset to the respective device (See *4.1.3.3 Assigning stations to the SIR150*).

During installation, after the device is registered on ChannelService, the settings will be communicated to the device the next time a database update is performed. The only applicable option in this situation is a database update “At startup”. The device needs to be (manually) powered on or restarted.

The database update also ensures that the SAS250 station is automatically update.

4.1.3.2 Registering SIR150 device

To add a SIR150 device on ChannelService, go to the Radio Devices page (“Radio Devices → Overview”), In this page you will see a overview of all of your radio devices. To add a new SIR150 device click the link “Create a new radio device” (see screenshot below).

Figure 4.4: Add a new radio device link

The device configuration form will be shown (see *Figure 4.5*).

Enter the serial number (①, serial number is found on the sticker located on the bottom of the device) and select the correct type (②, SIR150). Fill in the rest of the form as required.

④ A correct time-zone setting is especially important when the scheduler feature is used. The time/date of the device is also updated from ChannelService.

⑤ You can configure an audio gain between -100dB and 0dB with 0 (dB) being the maximum gain. For a gain of -3dB you fill in 3 (the minus (-) sign is added from ChannelService).

⑥ For STL applications, the “Low delay” feature must be checked, otherwise the audio latency would be between 10-15 seconds.

⑦⑧ SIR150 devices feature by default monitoring on ChannelService. The SIR device will send a status message every monitoring-interval (e.g. 15 minutes). When a monitoring interval of 0 (zero) is used, the SIR will not send status messages.

⑨ When using the web-interface, there is no need to enable the telnet interface. Should you have a reason to enable telnet, please keep in mind that there is no (password) protection; the device will always accept any incoming telnet connections (maximum one concurrent connection).

⑩⑪ SIR150 devices feature by default monitoring on ChannelService. The SIR device will send a status message every monitoring-interval (e.g. 15 minutes). When a monitoring interval of 0 (zero) is used, the SIR will not send status messages.

⑫ Enter the Playlist Update URL when applicable (when Store and Forward is used).

(13) When the options “Add my favorites” is checked, then the list of your favorite stations (which includes your private stations) will be applied as presets to your device. If you have already registered our SAS250, ChannelService has created automatically a private station; should you choose for the option to “Add my favorites” the SAS250 station would end up as a preset in the SIR. In case you have many stations under your favorites, then it is maybe not a good idea to use this option. You can always assign stations to your device “manually” (see §4.1.3.3).

(14) Click the “Save” button to apply the changes

During installation, after the device is registered on ChannelService, the settings will be communicated to the device the next time a database update is performed. The only applicable option in this situation is a database update “At startup”. The device needs to be (manually) powered on or restarted.

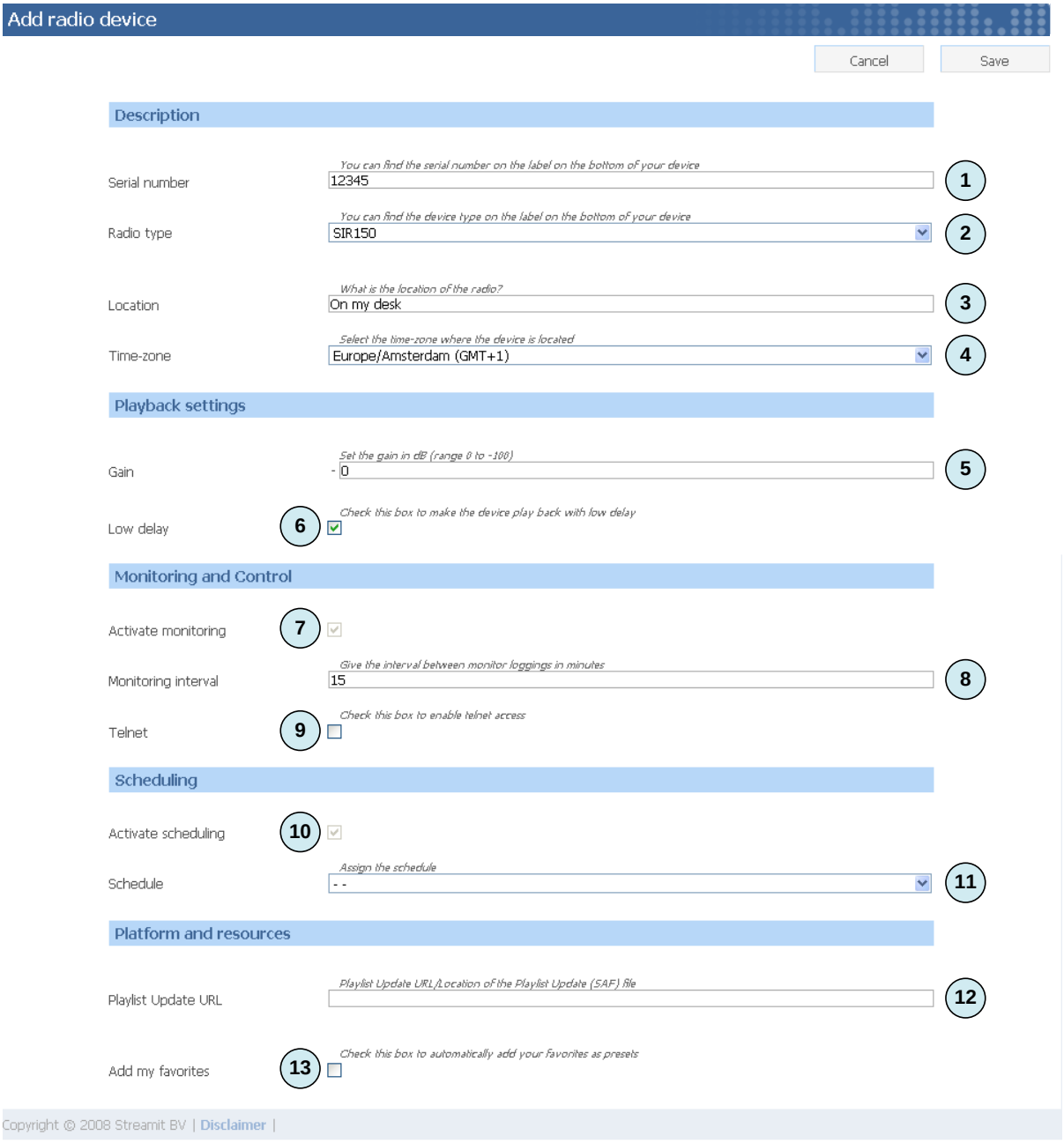


Figure 4.5: Register SIR150 device

4.1.3.3 Assigning stations to the SIR150

When the option “Add my favorites” did not apply during the registration of your SIR150 device you have to assign the SAS250 station as a preset to this device.

To do so, you can click the icon for the specific device, from the Radio devices overview page ("Radio Devices → Overview").

Another way is to view the device details (Click the icon for the respective device, in overview page) and click the button "Preset settings".

Click the icon to add a station as preset to the device. This station will show in the "Radio unit preset stations" list (see figure below).

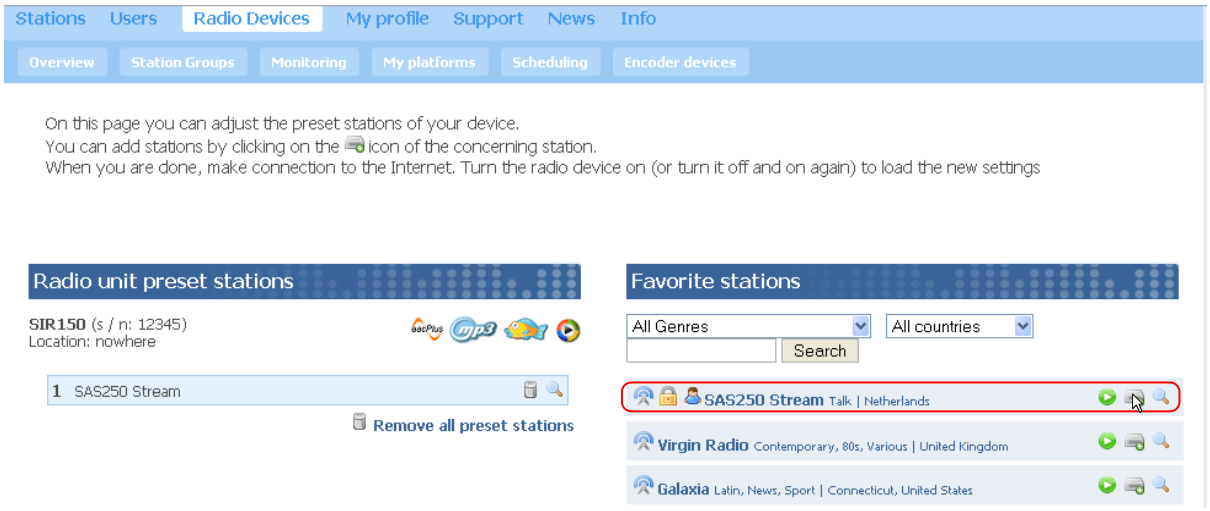


Figure 4.6: Assign stations presets to device

From the preset settings page, you can assign stations to our SIR150 device. The next time the SIR device performs a database update, the list of preset stations will be available in the device.

4.1.4 Changing device configuration

To change the configuration of the device, all you need to do is edit the device configuration on ChannelService. The device will get the new configuration the next time it performs a database update.

4.2 Telnet

Telnet is supported on both SAS250 and SIR150 devices, but is by default disabled. To configure your STL devices using the telnet interface, this must first be enabled. Telnet can be enabled from any of the other configuration interfaces (ChannelService and STP).

Not all telnet features are supported. The implementation can be seen as a command interface over TCP port 23. There is no (password) protection; the device will always accept any incoming telnet connections (maximum one concurrent connection).

4.2.1 When to use the telnet

You normally would use telnet in the following scenarios:

- There is no connection to the internet, preventing the use of ChannelService.
- You have build some custom application using the telnet interface.

4.2.2 What do you need

To configure your device using the Telnet interface, the following is required:

- Telnet must be enabled on the STL device
- Machine running a telnet client
- The IP address of the STL device to configure.
- The "STL Reference Manual", containing the command interface description for STL devices.

4.2.3 How does it work

If we were to depict an STL setup in a local network, we would get the figure below:

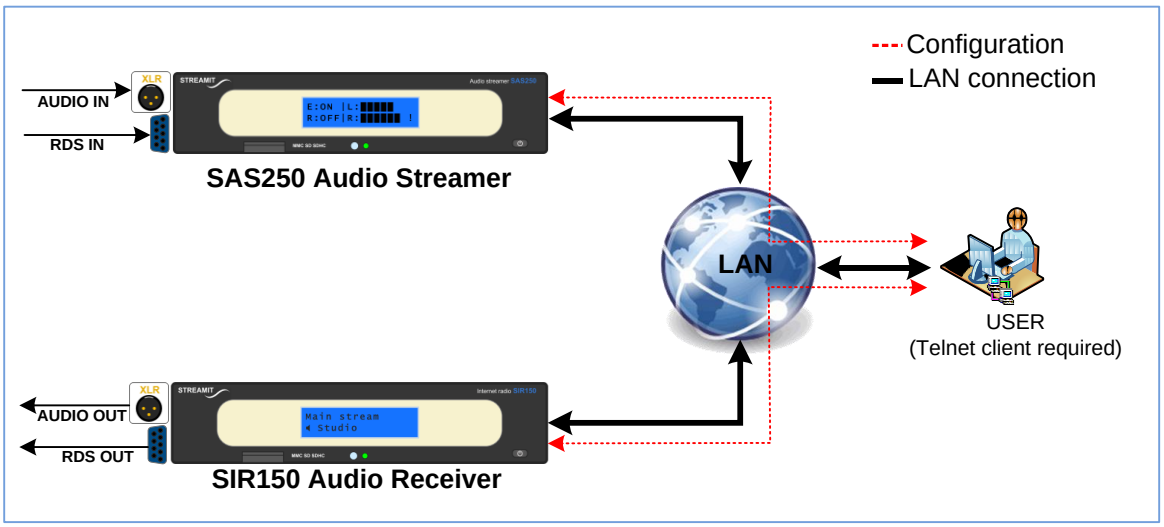


Figure 4.7: Using telnet

The device is constantly 'listening' for an incoming telnet connection. When a connection is valid, it is possible to control the device by sending commands as described in the command protocol (see the STL Reference Manual for a complete list of supported commands).

When Telnet is used as the configuration interface, we recommend that the device is set in the "I want to use fixed configuration" operation mode using STP, otherwise the device configuration will be overridden by the web-interface the next time the device perform a database update.

To break the connection with the device, you type the "quit" command (see *Figure 4.8*).

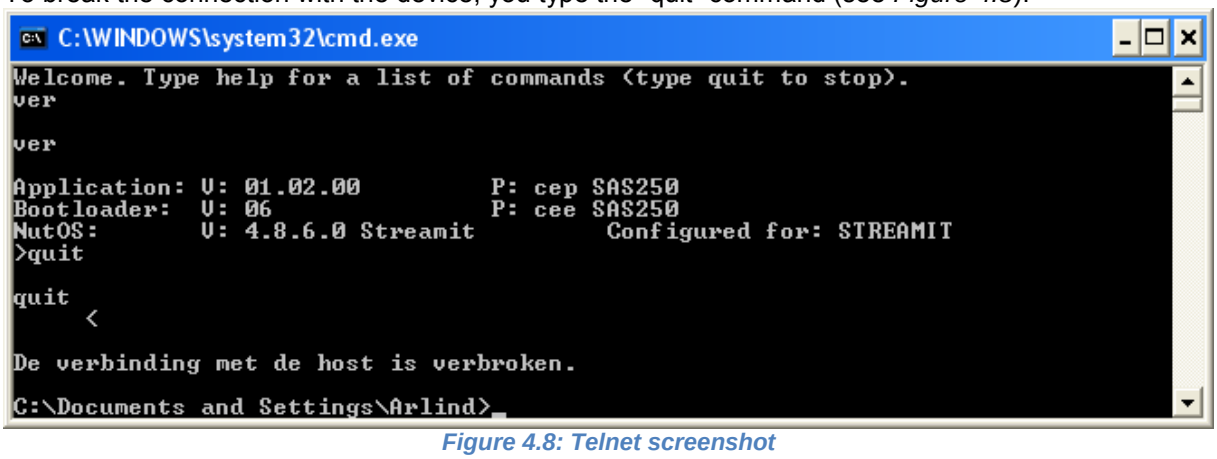


Figure 4.8: Telnet screenshot

4.3 STP (Streamit Terminal Program)

STP is a (MS Windows) PC tool than can be used to configure, monitor and update your Lukas, SIR and SAS devices. STP is free and can be downloaded from the download area of Streamit's website (http://streamit.eu). Once you have installed STP, you can connect your device using the USB cable. This will enable the communication with the device.

You can also use STP to configure your STL devices. STP is mainly intended for use during the installation phase. When using STP, the device is connected to a PC/Laptop via the USB cable.

STP is required for the IP configuration of the devices which is not possible from the web-interface.

4.3.1 When to use STP

STP is mainly intended for used in the following scenarios:

- During the installation phase, e.g. for the configuration of IP settings or enable telnet.
- For low-level monitoring of the devices.
- When you have a not to not use the other configuration interfaces, e.g. you only require fixed configuration in the device or you want to control the device via telnet interface. For these scenarios you set the device in the configuration mode “I want to use fixed configurations”.

4.3.2 Configure SAS250 with STP

To configure your SAS250, version 2.1.7 or higher is required. Start with the “General settings” of the device. Choose the Configure tab, then click Device button. This is also the default view when you start STP.

To configure the “General settings” of your device you follow these steps:

- Select the correct device type (SAS250).
- Select the operation mode “I want to use fixed configurations”.
- When required, you can change the Remote Software Update (RSU) settings. It is possible to enable or disable the RSU feature. When RSU is enabled, it is also possible to change the software update URL. In the screenshot below, the RSU configuration will not be changed.
- When required, you can select the desired settings for Telnet and RDS in the “Advanced” section of the settings,. You can enable or disable telnet and RDS; for RDS it is also possible to configure the baud-rate.

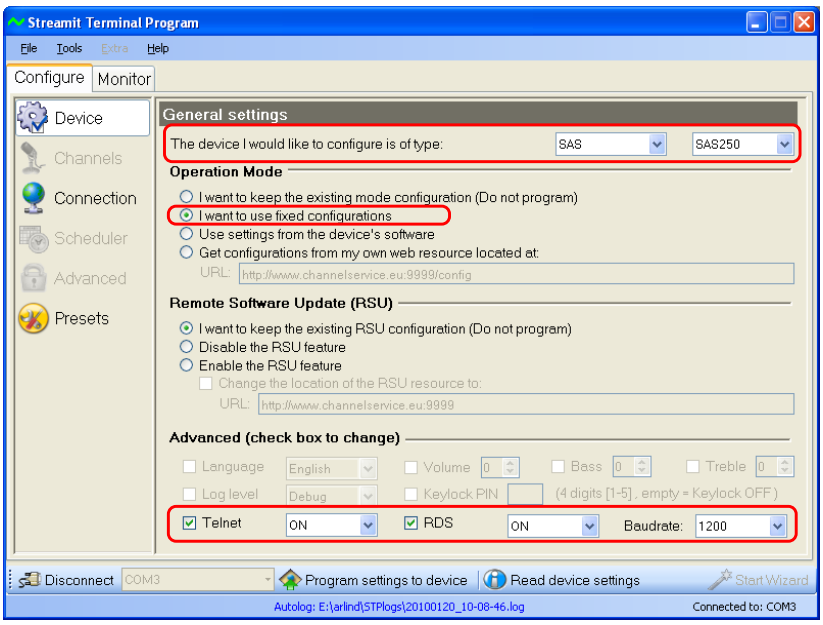
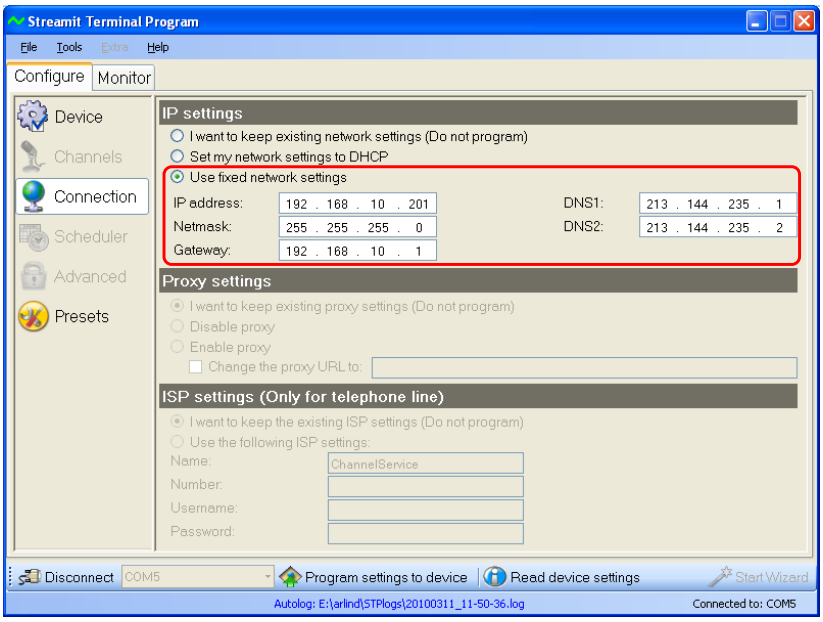


Figure 4.9: STP device page

To configure the “Network settings” of your device you follow these steps:

- Click the “Connection” button to access the network configuration page.
- Under the section “IP settings” you are given the option to configure the device either in DHCP or Static IP. Select the option “Use fixed network settings” and fill in the correct IP configuration.



- *Figure 4.10 Network setup*

To configure with the configuration of the settings related to the audio encoding process on your SAS250 device, you follow these steps:

- Click the button “Presets”, to access the Presets page. You will see that there is only one preset available for SAS250, and the only configurable parameter is the (audio communication) port.
- Choose the port you would like to use. In this example it was chosen for port 8000.

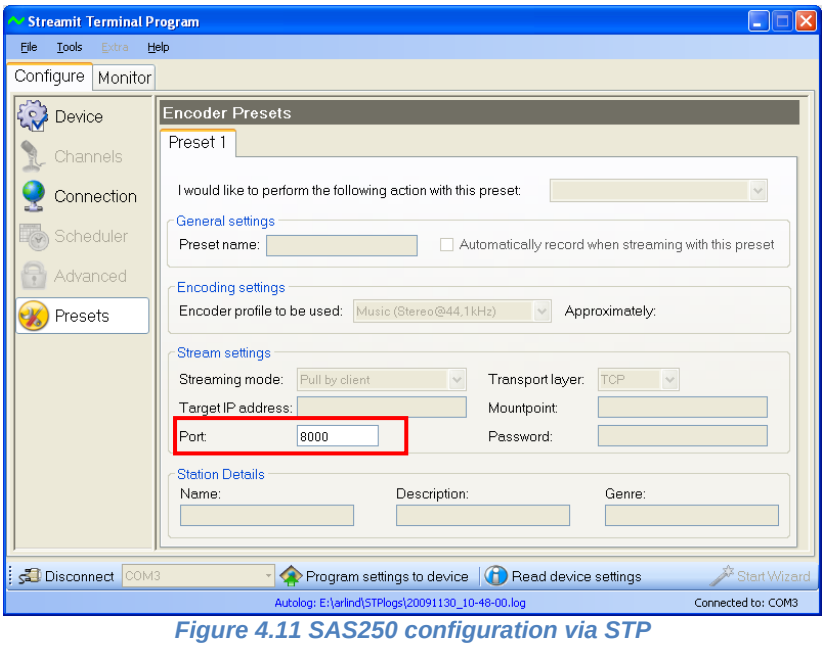


Figure 4.11 SAS250 configuration via STP

The settings will only be programmed in the device after you press “Program settings to device” button. See STP user manual for more information.

4.3.3 Configure SIR50 with STP

The SIR150, just like any other device in the SIR family can be configured using any of the available interfaces (STP, Channelservice etc.). To configure the SIR150 with STP, version 2.1.7 or higher is required.

To configure the “General settings” of your device you follow these steps:
- Select the correct device type (SIR150).
- Select the operation mode “I want to use fixed configurations”.
- When required, you can change the Remote Software Update (RSU) settings. It is possible to enable or disable the RSU feature. When RSU is enabled, it is also possible to change the software update URL. In the screenshot below, the RSU configuration will not be changed.
- A number of other settings can be found in the “Advanced” section. When required, you can change any of the supported settings. In the screenshot below, the menu language is configured to English, the volume gain to -3dB and telnet is switched off.

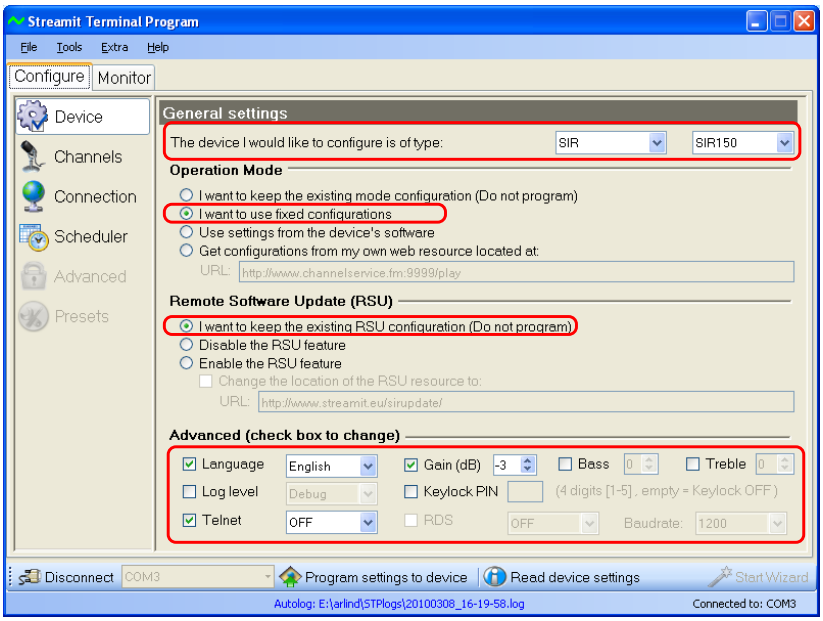


Figure 4.12 SIR50 configuration via STP

The “Network settings” of your SIR150 device, can be configured the same way as for the SAS250.

Unlike the SAS250, which is a server device; configuring the SIR150 in DHCP mode would in most cases work fine. This depends on the network where the device is located, but also on how the device is being used.

E.g. when you use telnet, the SIR150 is for this particular job a server. In this case it is recommended to configure the SIR150 with fixed network settings (See §*Figure 4.10*).

To configure the SAS250 stream as a station preset for the SIR150 device

- Click “Channels” button to access the stations page.
- Enter the SAS250 stream as a station preset for the SIR150 device. This requires to enter a name for the station, as well as the audio stream URL.
- As shown in *Figure 4.10* above, the IP address of the SAS250 was set to be 192.168.10.201 and the audio port 8000, which result in the URL http://192.168.10.201:8000/.

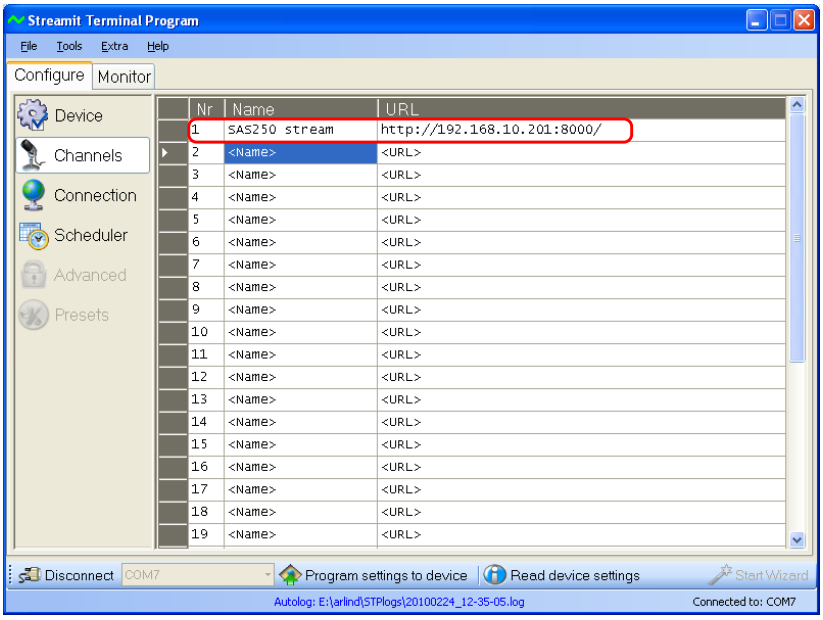


Figure 4.13 SIR50 configuration via STP - stations

4.4 Switching your STL set for the first time

The first time you switch on your STL device, it will be using its default settings. By default the STL device will try to connect to the remote web interface for the database update. When you have already registered your device on ChannelService, the device will get the correct configuration.

As a second step the device will perform a software update check. Should a newer version be available from the update server, the STL device will update to this version.

During the loading and programming of the new software (also called software update) it is important that you do not switch off and/or remove the power supply of the STL device. When you do this, you risk that the device won’t function anymore afterwards. In case this happens, you can load new software into the device using STP. See [1] for more information. The loading and programming of the new software may take up to about 20 seconds.

As a last step in the start up process the STL device will perform a schedule update and look whether there are tasks scheduled for it to carry out.

The device will perform all these actions by itself, no action from you is required. When the update procedures are finished, the SIR will start to play while the SAS will be ready to stream.

4.4.1 Playing a station on SIR150

When playing from internet, the SIR will start by connecting to the station (e.g. SAS250 stream). You will see that the status shown in the LCD will change to ‘Connecting…’, which indicates that the SIR is trying to connect with the chosen station. When the connection succeeds the status will change to ‘Buffering…’, indicating that audio data is being streamed to your internet radio device. No audio is sent to the output yet.

After a couple of seconds, the SIR will start to play the stream and you will hear audio coming out of your audio installation. The station name with a speaker icon in front will be shown on the lower row of the LCD, while on the upper row shows metadata of the audio stream when available.

4.4.2 Streaming live on SAS250

When the update procedures are finished, the SAS250 will wait for a client (e.g. SIR150) to connect to it.

When a client device is connected, the SAS250 starts streaming. On the LCD you will see the VU meter as well as the text “LIVE” indicating that the audio being streamed is coming from the audio input.

Depending on whether RDS has been switched on or off, the text “+RDS” would be shown. Very important is the warning character “!”. When this appears, the input level is too high and must be lowered.

4.4.3 Streaming pre-recorded content on SAS250

The SAS250 is not only capable to stream live content; it is also possible to stream pre-recorded audio from a MMC/SD/SDHC card. Pre-recorded streaming can be initiated by sending the correct command (ss - start streaming) from any of the available interfaces, or scheduling a scheduler task etc.

When streaming pre-recorded audio, the LCD looks very much like for live streaming; except the text “CARD” is now shown to indicate streaming from card.