BARIX
THE VOICE OF SIMPLICITY

USER MANUAL

Instreamer

Network audio encoder for commercial, industrial and security applications

Firmware: V4.03
Released: 24th October 2013
Supports:

- **INSTREAMER 100**
- **INSTREAMER**
- **EXSTREAMER 1000, 500**
- **ANNUNCICOM series**

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1 Introduction

1.1 About the “Instreamer” firmware

The “Instreamer” firmware is designed to serve as a versatile, network-enabled analog and digital audio-to-Ethernet converter for commercial audio distribution.

The “Instreamer” firmware converts audio from any analog or digital device into G.711 (8 bit), PCM (16 bit) or high-quality MP3 streams. The audio is encoded in real-time, and the generated audio stream can be distributed, via an IP-based network or the Internet, to one or more receivers or Shoutcast / Icecast-servers.

Barix devices running the “Instreamer” firmware can be easily managed via a web browser interface using PCs, web pads, PDAs or other web-enabled devices. SNMP remote monitoring capabilities allow for building a manageable distributed audio network. With serial and Ethernet control APIs, open IP-standards, and the standard encoding formats, the device can also be integrated with other components, controlled by automation systems, or used with Barix Exstreamers to create more flexible, more cost-effective distributed audio systems.

The built-in serial interface allows data to be relayed to another Barix device, a PC or a server using the “Serial Gateway” functionality of the “Instreamer” firmware.

With an optional stick-on transmitter, additional IR-enabled devices can be remote controlled via the network connection, enabling users to control their audio sources without being in the same location as the device.

1.2 Features

- Generates MP3 streams at adjustable bit rates (VBR) from analog or digital (optical/coaxial S/P DIF) sources. With the latest Instreamer (ID 43) Constant Bit Rate (CBR) can also be configured.
- Generates G.711 (aLaw/uLaw) streams at 8 or 24 kHz sample rate from an analog source
- Generates aLaw/uLaw streams at 12 or 32 kHz sample rate from an analog source
- Generates PCM (16 bit) streams at 8,12,24,32 kHz sample rate, mono big or little endian and 44.1 kHz sample rate mono big endian from an analog source
- Generates PCM (16 bit) streams at 44.1 and 48 kHz sample rate, stereo big or little endian from an analog source.
- Supported stream connections: HTTP, BRTP, RTP, SIP, Raw UDP, Raw TCP, Icecast and Icecast ID3 source, Shoutcast source
- Supports stream authentication (HTTP, Shoutcast, Icecast)
- 10/100 Mbit Ethernet connection supports automatic network configuration (BOOTP, DHCP, AutoIP and IPzator) as well as manual static IP configuration
- Features SonicIP ® announcing the IP address on power up over the audio outputs
- Control and configuration using a standard web browser
- Remote monitoring using SNMP
- Remote controllable using HTTP, TCP and UDP

- Supports IR remote control command relaying (Network to IR out).
- Supports Serial Port relaying (Serial gateway over Network)
- From FW V3.17. Supports all General Purpose Inputs (GPIs) on the Exstreamer 1000, Exstreamer 500 and Annuncicom 1000. The Inputs are used either to trigger streaming or to send contact closures to a partner device with SW loaded capable of decoding the information. (e.g. Streaming Client V2.10 or later).
- From FW V4.02 the WEB UI was given a completely different "look and feel" to make the configuration task simpler and also to reflect Barix's new Corporate Identity.

1.3 Installing the device

For the installation of the Barix Instreamer or the legacy Barix Instreamer 100 please refer to the corresponding "Quick Install Guide".
A printed version is included in the box and can also be downloaded from our site www.barix.com.

1.4 Additional documents

Technical specifications can be found in the corresponding product sheet which can be downloaded from our site www.barix.com.

For detailed technical information about the CGI application programming interface (API) please download the "Instreamer Technical Documentation" from our website.

1.5 Preloaded Firmware

Barix preloads the Instreamer 100 with the “Instreamer” firmware version. If other HW is being used then the factory firmware will have to be replaced.

Before continuing with this manual make sure that the firmware version is up to date and corresponds with this manual. Please proceed to chapter 6 Updating the device in order to do so.

1.6 About this manual

Links to chapters

References to chapters (e.g. X Chapter name) are red and underlined and serve as direct links when viewed in Adobe Acrobat Viewer. Click on the link to jump to the referenced chapter, click on the left arrow icon to jump back to where you came from.

Links to the Dictionary

Some technical terms (e.g. DHCP) are underlined and red. Click on them to jump to the dictionary at the end of this manual, click on the left arrow icon to jump back.

Bookmarks pane in Adobe Acrobat

The complete “Table of Contents” is available in Adobe Acrobat Viewer. Click on the “Bookmarks” pane tab on the left side of Adobe Acrobat Viewer to open it. Click on any bookmark to directly jump to the corresponding part of the manual.

Chapter overview

This manual is divided into the following chapters:

- Device Status and Control (controlling the device via the WEB UI)
- Device Configuration (explaining all configuration parameters)
- Updating the Firmware (explaining how to update or how to change from “standard firmware”)
- Step by step “How To” (explaining configuration for external services and devices)
- IR Remote control (explaining the functionality of the Barix IR Remote control)
- Advanced User section (explaining configuration via Serial cable and reference to the CGI API)
- Dictionary (explaining technical names and expressions used in this manual)

2 Device Status and Control

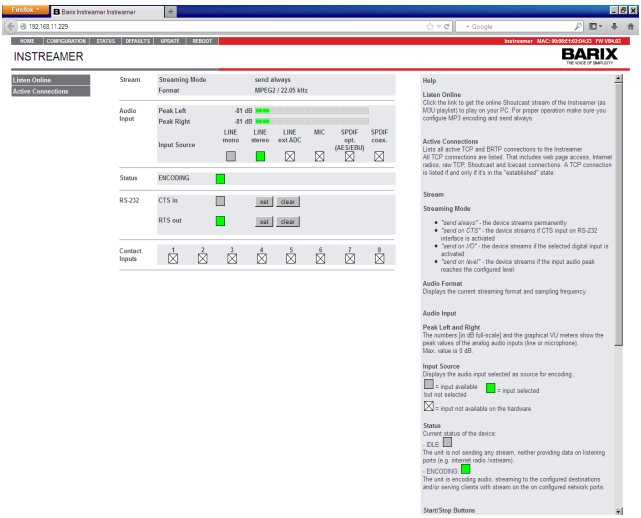
To view the current status and control it using the Web interface you will need:

- the IP address announced over the audio outputs (see the Quick Install Guide)
- a standard web browser

Open your web browser and type in the IP address of the Barix device in the URL field and hit the “Enter” key.

- Example: “192.168.0.229”

You will see the following window content:



The top frame shows the logos “INSTREAMER” and “BARIX”.

Help information will show up in the right, grey frame of the browser window.

The middle frame shows current status information

and permits the control of the streaming status, the simulation of the CTS input signal and the control of the RTS output. For details see the section below.

2.1 Listen and Active Connections

The left frame has two selectable buttons.

Listen Online

Click the link to get the online Shoutcast stream of the Instreamer (as M3U playlist) to play on your PC. For proper operation make sure you configure MP3 encoding and send always.

Active Connections

Lists all active TCP and BRTP connections to the Instreamer. All TCP connections are listed. That includes web page access, Internet radios, raw TCP, Shoutcast and Icecast connections. A TCP connection is listed if and only if it's in the "established" state.

2.2 Status and Control

The middle frame shows current status information and permits the control of the streaming status, the simulation of the CTS input signal and the control of the RTS output. The page is refreshed automatically.

Streaming Mode

- *"send always"* - the device streams permanently
- *"send on CTS"* - the device streams if CTS input on RS-232 interface is activated

- *"send on I/O"* - the device streams if the selected digital input is activated
- *"send on level"* - the device streams if the input audio peak reaches the configured level

Audio Format

Displays the current streaming format and sampling frequency.

Peak Left and Right

The numbers [in dB full-scale] and the graphical VU meters show the peak values of the analog audio inputs (line or microphone).
Max. value is 0 dB.

Input Source

Displays the audio input selected as source for encoding.:
- grey box = input available but not selected
- green box = input selected
- crossed box = input not available on hardware

Status

Current status of the device:
IDLE: grey box
The unit is not sending any stream, neither providing data on listening ports (e.g. internet radio /xstream).

ENCODING: green box
The unit is encoding audio, streaming to the configured destinations and/or serving clients with stream on the on configured network ports.

Start/Stop Buttons

In *"send on..."* modes the Instreamer functionality can be controlled with the *"start"* and *"stop"* buttons.

RS-232

Status of the hardware flow control signals of the device's RS-232 iterface. The signals can be used as a control input or output to control the device or an attached equipment.

CTS in

Displays the status of the hardware CTS input signal:
- grey box = Inactive
- green box = Active

Click the *"set"* button to emulate CTS being activated.
Click the *"clear"* button to emulate CTS being deactivated.
Note: the emulated input is not displayed on the status page.

RTS out

Displays the status of the hardware RTS output signal:
- grey box = Inactive
- green box = Active

Click the *"set"* button to activate the RTS signal.
Click the *"clear"* button to deactivate the RTS signal.

Contact inputs

Displays status of the eight digital contact closure inputs (if available on the hardware):
- grey box = idle
- green box = Active
- crossed box = input not available on hardware

3 Device Configuration

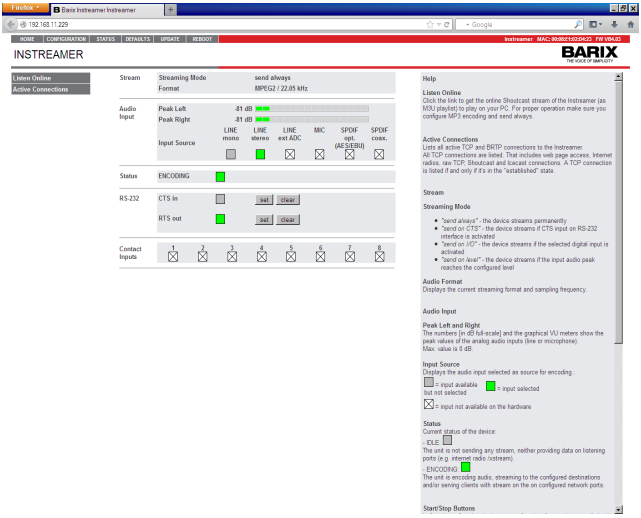
You can adjust network settings, streaming destinations, monitoring settings and more with the Web interface. To enter the configuration mode you will need:

- the IP address announced over the audio outputs (see the Quick Install Guide)
- a standard web browser

Open your web browser and type in the IP address of the Barix device in the URL field and hit the “Enter” key.

- Example: “192.168.11.229”

You will see the following window content:



The top frame shows the logos “INSTREAMER” and “BARIX”. Help information will show up in the right, grey frame of the browser window.

Press the “Listen Online” button to open the radio

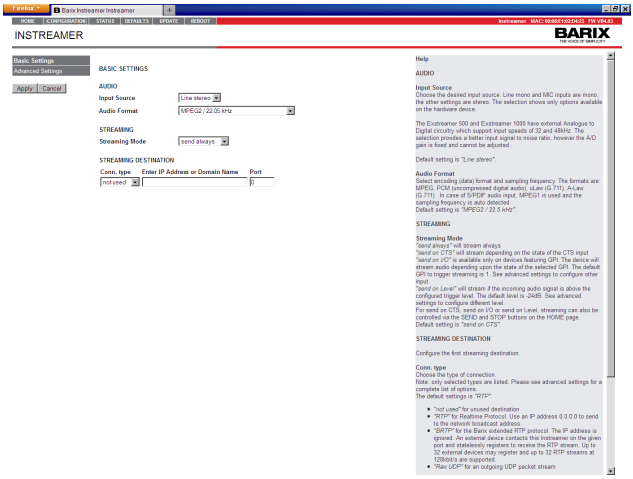
playlist file instreamer.m3u. Press the “Active Connections” button to open a new window showing the current active protocols and ports.

To obtain the configuration pages click the CONFIGURATION button at the top of the page.

Note that the “screen shots” shown are for the “Instreamer” HW. Other HW, for example, the Exstreamer series, may have additional options to support the enhanced features. In which case more selection options are shown on the device`s Web page.

3.1 Basic settings

The configuration page entered by pressing the CONFIGURATION button is headed Basic Settings.



The page allows the easy configuration of the most common use case of a single stream entry. The same configuration parameters also appear under the Advanced Settings. Refer to these for more detailed information.

Input Source

Choose the desired Audio input source. Line mono and MIC inputs are mono, the other settings are stereo.
Default setting is *"Line stereo"*.

Audio Format

Select encoding (data) format and sampling frequency. The formats are: MPEG, PCM (uncompressed digital audio), uLaw (G.711), aLaw (G.711).
Default setting is *"MPEG2 / 22.5 kHz"*.

Streaming Mode

"send always" will stream always
"send on CTS" will stream depending on the state of the CTS input.
"send on Level" will stream if the incoming audio signal is above the configured trigger level. The default level is -24dB.
For send on CTS or send on Level, streaming can also be controlled via the SEND and STOP buttons on the HOME page.
Default setting is *"send on CTS"*.

STREAMING DESTINATION - Conn. type

Choose the type of connection.
Note: only selected types are listed. Please see advanced settings for a complete list of options.

- *"not used"* for an unused destination
- *"RTP"* for Real Time Protocol. Use an IP address 0.0.0.0 to send to the network broadcast address.
- *"BRTP"* for the Barix extended RTP protocol. The IP address is ignored. An external device contacts this Instreamer on the given port and statelessly registers to receive the RTP stream. Up to 32 external

devices may register and up to 32 RTP streams at 128kbit/s are supported.
- *"Raw UDP"* for an outgoing UDP packet stream.

Default settings is *"RTP"*.

STREAMING DESTINATION - IP Address or Domain Name

If an active connection is required a Domain Name or an IP address can be provided. An example of a Domain Name is www.myserver.com. If an IP address is provided, e.g. 192.168.0.34, then this is used, otherwise the device attempts to obtain the IP address from a Domain Name Server.

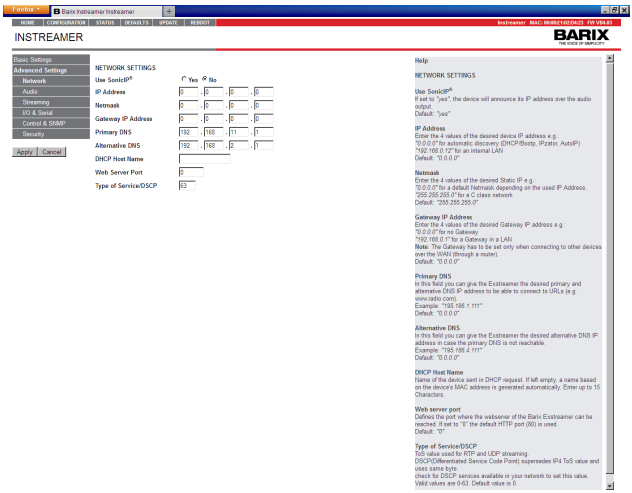
STREAMING DESTINATION - Port

Enter the port number for each destination (between *"0"* and *"65535"*). *"0"* defines the following default ports: Internet Radio *"80"*, TCP *"2020"*, UDP *"3030"*. For Shoutcast, enter the base port (the lower one, the same as clients put into their radio players). Default settings *"0"*.

3.2 Selecting Advanced Settings

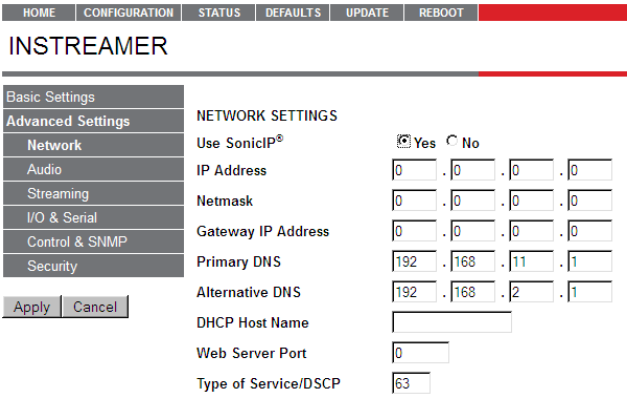
To access the full set of configuration options, press the Advanced Settings button.

A list of options is shown on the left together with the Network settings. The required page can be opened by selecting an option. Parameters can be changed at will on any of the pages. It is only necessary to press the Apply button once after all changes have been made. This chapter explains how to adjust the network settings of the Barix device.



3.3 NETWORK SETTINGS

The following diagram shows the network settings for automatic discovery (See IP address below). However, we recommend that you set a Static IP address so that the device does not have to get a new IP address at power on or reboot.



Use SonicIP®

If set to *"yes"*, the device will announce its IP address over the audio output.
Default: *"yes"*

IP Address

Enter the 4 values of the desired static IP address e.g.:

- "192.168.0.12" for an internal LAN

Attention: Make sure that you enter a free IP address. The device will check this and will not be available until the device using the same IP is disconnected or switched off. The command Ping can be used to ensure that a specific IP address is unused (i.e. No reply).

The automatic discovery functions are not executed if a Static IP address is set.

The automatic options are as follow:

- "0.0.0.0" for automatic discovery (Discovery order: BOOTP, DHCP, IPzator, AutoIP)

For each function you want to disable add the value from the table below:

- “0.0.1.0” to disable AutoIP
- “0.0.2.0” to disable DHCP
- “0.0.4.0” to disable BOOTP
- “0.0.8.0” to disable IPzator

Examples:

- “0.0.3.0” disables AutoIP and DHCP
- “0.0.11.0” disables all except BOOTP

Attention: “0.0.15.0” disables all discovery functions which locks you out unless you reset the device to factory defaults by pressing the reset button for about 10 seconds.

Netmask

Enter the 4 values of the desired Netmask e.g.:

- “0.0.0.0” for a default Netmask depending on the IP Address used
- “255.255.255.0” for a C class network

Note: Try first the Netmask your PC is set to or ask your Network Administrator.

Gateway IP Address

A correct setting of the Gateway IP address is needed to stream to the Internet or to destinations outside your local network (LAN).

Enter the 4 values of the desired Gateway IP address e.g.:

- "0.0.0.0" for no Gateway or automatic discovery
- "192.168.0.1" for a Gateway in a LAN

Note: If you have set the devices IP address to automatic discovery and your server or router has

issued an IP address then most probably it also has supplied a valid Gateway address, "0.0.0.0" will then work fine.

If you have set a Static IP address then you will need to configure a valid Gateway address manually. Try first the same Gateway IP address your PC is set to. If it doesn't work then ask your Network Administrator for a correct Gateway IP address.

Primary/Alternative DNS

In these fields you can provide DNS IP addresses which are used to resolve URLs, e.g. www.radio.com

DHCP Host Name

From version VB3.17 a DHCP host name can be configured for the device. If this field is left blank then the device creates a DHCP name using part of the Ethernet MAC address e.g."CO1ED04" where ED04 are the 2 least significant bytes of the MAC.

Web server port

Defines the port where the webserver of the Barix Exstreamer can be reached. If set to "0" the default HTTP port (80) is used. Default: *"0"*.

Type of Service/DSCP

Type Of Service value used for RTP and UDP streaming. DSCP (Differentiated Service Code Point) supersedes the IP4 ToS value and uses the first 6 bits of the TOS field.

The following table illustrates the DSCP values:

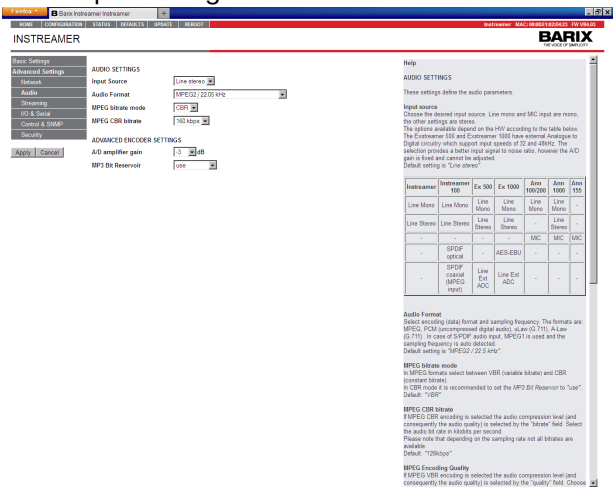
Per Hop Behaviour (PHB)			DiffServ Code Point (DSCP)		IP Precedence
Default					0
		000000			
Assured Forwarding		**Low Drop Probability**	**Medium Drop Probability**	**High Drop Probability**	
	Class 1	AF11	AF12	AF13	1
		001010	**001**100	**001**110	
	Class 2	AF21	AF22	AF23	2
		010010	**010**100	**010**110	
	Class 3	AF31	AF32	AF33	3
		011010	**011**100	**011**110	
	Class 4	AF41	AF42	AF43	4
		100010	**100**100	**100**110	
Expedited Forwarding		EF			5
		101110			

Check for DSCP services available in your network to set this value. Valid values are 0-63.

Default value is 0.

3.4 Audio settings

This chapter explains how to adjust the audio input and output settings of the Barix device.



Input source

Choose the desired input source. Line mono and MIC input are mono, the other settings are stereo. The options available depend on the HW according to the table below. The Exstreamer 500 and Exstreamer 1000 have external Analogue to Digital circuitry which support input speeds of 32 and 48kHz. The selection provides a better input signal to noise ratio, however the A/D gain is fixed and cannot be adjusted. Default setting is *"Line stereo"*.

Instreamer	Ex 500	Ex 1000	Ann 100/200	Ann 1000	Ann 155
Line Mono	Line Mono	Line Mono	Line Mono	Line Mono	-
Line Stereo	Line Stereo	Line Stereo	-	Line Stereo	-
-	-	-	MIC	MIC	MIC
SPDIF optical	-	AES-EBU	-	-	-
SPDIF coaxial (MPEG input)	Line Ext ADC	Line Ext ADC	-	-	-

Audio Format

Select encoding (data) format and sampling frequency. The formats are: MPEG, PCM (uncompressed digital audio), uLaw (G.711), aLaw (G.711) . In case of S/PDIF audio input, MPEG1 is used and the sampling frequency is auto detected. Default setting is *"MPEG2 / 22.5 kHz"*.

The bit rate used for 8 and 24kHz G.711 and PCM is displayed in kbit/sec. in the table below.

Encoding / Sampling freq.	8 kHz	24 kHz
G.711 8bit (uLaw or aLaw)	64	192
PCM 16bit	128	384

For MP3 average bit rates see Encoding Quality below.

MPEG bitrate mode

Select between VBR (variable bitrate) and CBR (constant bitrate) MPEG formats.
In CBR mode it is recommended to set the *MP3 Bit Reservoir* to *"use"*.

Warning: For potentially "lossy" transmission types, typically RTP, use VBR where ever possible.

Note: For devices (e.g. Instreamer 100) with an IPAM type of "generic" only VBR is supported.

Default: *"VBR".*

MPEG CBR bitrate

If MPEG CBR encoding is selected the audio compression level (and consequently the audio quality) is selected by the "bitrate" field. Select the audio bit rate in kilobits per second.
Please note that depending on the sampling rate not all bitrates are available.
Default: *"128kbps"*

Encoding Quality

If MPEG VBR encoding is selected the audio compression level (and consequently the audio quality) is selected by this parameter. Choose between "0 lowest" and "7 highest" in steps of 1. The encoder quality table below shows the average bit rate in kilobits per second for the quality settings and sampling frequencies in kHz using mono input with MS-Stereo encoding disabled.

Encod./Quality	0	1	2	3	4	5	6	7
MPEG1 48kHz	72	76	80	88	96	112	144	160
MPEG1 44.1kHz	65	68	73	80	90	105	125	140
MPEG1 32kHz	52	56	64	72	80	96	112	136
MPEG2 24kHz	38	44	48	52	60	80	96	112
MPEG2 22.05kHz	35	38	40	45	50	60	75	90
MPEG2 16kHz	28	30	34	40	44	48	56	64

The encoder quality table below shows the average bit rate in kbit/s (kilobits per second) for the quality settings and sampling frequencies in kHz using

stereo inputs.

Encod./Quality	0	1	2	3	4	5	6	7
MPEG1 48kHz	88	96	104	120	144	160	176	192
MPEG2 16kHz	35	38	44	48	56	64	80	96

The above table shows only the average bit rates for 16 kHz and for 48 kHz. As the “stereo” adds about 20 to 30 percent when compared to “mono” other sampling frequencies can be calculated using the previous “mono” table.

Advanced Encoder Settings

The following settings are for advanced users only.

Microphone gain (Annuncicom series only)

Choose the desired gain (*"21"* - *"43.5"* dB) for the microphone.

Default setting is *"21"* dB.

A/D amplifier gain

Choose the desired gain (“-3” up to “19.5” dB) for the line input A/D amplifier.

Default setting is *"-3"* dB.

MP3 Bit Reservoir

The Bitreservoir is used to compensate the differences between the predefined frame sizes. If set to *"use"*, the encoder will use the bit reservoir.

Note: if you use RTP streaming, to avoid audio artefacts due to lost packets, set Bit Reservoir to *"keep empty" and use VBR.*

Default setting is *"use"*.

Advanced MP3 Encoder Settings

The following features are only available on IPAM Type: generic

MP3 Frame CRC

If set to "*enable"*, the encoder will include the CRC-16 in each MP3 frame.

MP3 Channel Mode Extension

"Enable" or "disable" the MS-Stereo encoding (for stereo only). When set to "*disable MS-Stereo encoding"* only mono will be encoded and therefore the bandwidth used is minimized.

MP3 Copyright Protection

"Enable" or "disable" the copyright protection bit in the MP3 stream.

MP3 Stream Type

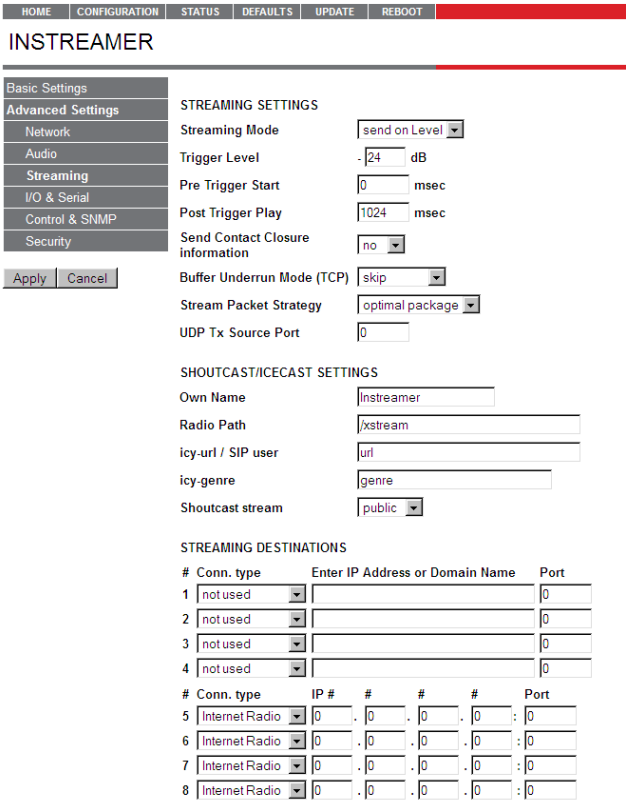
Select between a "copy" or an "original" in order to set the appropriate bit in the MP3 stream.

MP3 Emphasis

Select emphasis "none", "50/15 us" or "CCITT J.17".

3.5 Streaming settings

These settings adjust the streaming mode, parameters and destinations.



Streaming mode

Streaming is started depending on the selected operating mode:

- send always will stream always
- send on CTS will stream if the SEND button (command) is pressed or CTS (Pin 8 Serial connector) is connected to a positive supply (9VDC, Pin 4 Serial connector)
- send on Level will stream if the incoming analogue audio signal is above the Trigger level (see section below). This feature is not available for digital inputs.
- send on I/O (only available on devices with GPI) will stream audio depending upon the state of the GPI configured as the Control GPI
- For send on CTS, send on I/O or send on Level, streaming can also be controlled via the SEND and STOP buttons on the HOME page.

Default setting is *"send on CTS"*.

Trigger level

The Trigger level is only used when Streaming mode is set to **send on Level.**

Select a value between 0 and 32767.
Open the Device status page and look for the Input peak value to get a hint for the trigger value. This page refreshes itself every few seconds.

Pre Trigger Start

PreTrigger Start is only used when Streaming mode is set to **send on Level.**

PreTrigger Start can be adjusted to prevent a cut off when audio should be sent earlier than detected. It defines the amount of time that will be streamed before the actual trigger occurred.

Post Trigger Play

Post Trigger Play is only used when Streaming mode is set to **send on Level.**

Post Trigger Play can be adjusted to prevent a cut off when audio should be sent longer than detected. It defines the amount of time that the device will continue streaming after the actual trigger has been cleared.

Contact Closure

Contact Closure is only used when Streaming mode is set to **send on I/O.**

Defines the contact closure input (GPI) that controls the device streaming in *"send on I/O"*. Select the polarity in *"Input Polarity"*.

Input Polarity

Input Polarity is only used when Streaming mode is set to **send on I/O.**

Selects the contact closure event that triggers the streaming in *"send on I/O"* mode. *"active closed"* causes the device to stream when the selected contact is closed. *"active open"* causes the device to stream when the selected contact is open. Used to select whether the device streams when the selected control GPI is in the open or closed state.

Send Contact Closure Information

The current state of the device's GPI is inserted into RTP and Shoutcast streams. (This also applies to the BRTP connection type which uses an RTP stream). This feature is compatible with Streaming Client v02.10 and later.

Buffer Underrun Mode (TCP)

The Buffer Underrun Mode (TCP) defines the action if a TCP stream is slower than the real stream from the encoder. In this case the output streaming buffer underruns and cannot hold older data any more. The device can then "disconnect" the TCP connection or it can "skip" the stream directly to the encoder stream without disconnecting TCP.

Streaming Packet Strategy

The Streaming Strategy defines how a packet is build and sent. On "lowest latency" the encoded data will be sent directly after the encoding. On "optimal package" the packet will be filled up before sending.

UDP Tx Source Port

This setting is only used with a custom software application. Enter the used source port number for a UDP stream (between 0 and 65535). When set to 0 the source port is set to the same port as selected in the destination port (in section Stream to). If destination is set to "origin source" the UDP Receiver Port is used.

SHOUTCAST/ICECAST SETTINGS

The following parameters are used for Shoutcast and Icecast

Own Name

You can enter the name of the Barix Instreamer here. This is returned by the DISCOVER command (see technical documentation).
Default setting is *"Instreamer"*. Used also as Shoutcast station name (icy-name).

Radio Path

Enter a radio path to listen to the transmitted stream of this Barix Instreamer using a device that is able to play MP3 radio stations (also PC software like WinAmp). The URL to connect is **`http://x.x.x.x/p`** where **`x.x.x.x`** is the IP address of this device and **`/p`** is this Radio path.
Example: **`http://192.168.0.24/xstream`**
The device can serve up to 6 concurrent radio streams

icy-url / SIP user

"icy-url" is taken into account only for Shoutcast. Enter URL of web of your radio station (up to 60 characters).
Example: "**`http://www.exampleradio.com`**"
Default setting is empty.

SIP user is the user name that will be called on the target SIP device (SIP server or SIP phone)
Example: "**`betty`**" calls "**`betty@192.168.2.21`**"

icy-genre

Genre of streamed music (icy-genre header). Taken into account only for connection when "Shoutcast source stream" type is selected.
Default setting is empty

Shoutcast stream

Select if the stream is private or public (icy-public header). Taken into account only for connection with Shoutcast source stream type selected.
Default setting is "public".

STREAMING DESTINATIONS

There are up to 8 configurable stream destinations. Each one can be directed to a device, or a multi- or broadcast address. The first 4 entries allow a Domain Name to be defined as an alternative to an IP address.

Conn. type

The connection types are described in the following sections. The following table summarizes which connection types can act as passive listeners and which as active senders.

Passive (listener)	Internet Radio	-	BRTP	-	-	Raw TCP	-	Shoutcast
Active (Sender)	-	RTP	-	SIP	Raw UDP	Raw TCP	Icecast source	Shoutcast

Connection type - not used entry

Set the connection type to “not used” to disable an entry. The IP and Port can be left as is as they are as they do not matter on a disabled entry.

Connection type - Internet Radio entry

Set the connection type to “Internet Radio” radio server for a single client (default). The IP “0.0.0.0” will act as a TCP listener (HTTP) waiting for a connection on the port selected under “Port#” (0=80). Users must provide the Radio Path string (see Radio Path above) or as an alternative one of the following play list formats:

- instreamer.m3u
- instreamer.asx
- instreamer.pls
- instreamer.ram

The m3u and asx files have an alternative radio path defined which can be modified by providing an IP address and optional port number in entry #8 of the Streaming table. If the port entry is left as 0 then the normal HTTP port 80 is used.

Other configurations are also possible since in general entry #7 of the Streaming table modifies the first entry in the m3u and asx files and entry #8 modifies the second file entry.

Limitation: Although eight entries can be configured only six concurrent radio servers are supported.

Connection type - RTP entry

Set the connection type to “RTP” (Real Time Protocol) for an RTP destination. The IP “0.0.0.0” will broadcast (UDP) on the subnet (e.g. "192.168.0.255") on the port selected under “Port#” (e.g. 4040), enter an IP for a UDP unicast destination (e.g. “192.168.0.11).

Connection type - BRTP entry

Set the connection type in the first entry to “BRTP” (Barix Real Time Protocol) for a BRTP server (up to 32 clients). The IP “0.0.0.0” will act as a BRTP listener (UDP) waiting for BRTP clients requesting a stream on the port selected under “Port#” (e.g. 80).

Up to 32 external devices may register and up to 32 RTP streams at 128kbit/s are supported. This maximum rate is approximately provided by the MP3 setting: Encoding+Frequency MPEG1/48kHz and Encoding quality 5.

Connection type - SIP entry

SIP is only available with the first entry.
Set the connection type to “SIP” for an asterisk SIP server destination. Enter the IP of the SIP server. SIP works only when either “u-Law 8kHz” or “a-Law 8kHz” encoding is selected. Enter the UDP port of the SIP server under “Port#” (Port 0=5060).
See also section icy-url / SIP user further above.

Connection type - Raw UDP entry

Set the connection type to “Raw UDP” for an UDP destination. The IP “0.0.0.0” will broadcast (UDP) on the subnet (e.g. "192.168.0.255") on the port selected under “Port#” (0=3030), enter an IP for a UDP unicast destination (e.g. “192.168.0.11).

Connection type - Raw TCP entry

Set the connection type to “Raw TCP” for a single TCP client. The IP “0.0.0.0” will act as a TCP listener waiting for a connection on the port selected under “Port#” (0=2020).

Connection type - Icecast source entry

Set the connection type to Icecast source to connect (TCP) to a single Icecast server. Enter IP and port of the Icecast server for the device to act as an Icecast source. When authentication is needed please read also section Icecast/Shoutcast (Security settings).

Connection type - Shoutcast source entry

Set the connection type to “Shoutcast source” to connect (TCP) to a single Shoutcast server. Enter IP and port of the Shoutcast server for the device to act as a Shoutcast source. When authentication is needed please read also section Icecast/Shoutcast (Security settings).
The IP “0.0.0.0” will let the Instreamer act as a Shoutcast server itself waiting for a connection on the port selected under “Port#”. The function is then limited to a single client (a media player like Winamp) and only one entry is allowed to be set to Shoutcast server (IP 0.0.0.0).

IP Address or Domain Name

If an active connection is required within the first 4 entries, a Domain Name or an IP address can be provided. An example of a Domain Name is www.myserver.com. If an IP address is provided, e.g. 192.168.0.34, then this is used, otherwise the device attempts to obtain the IP address from a Domain Name Server.
Default setting: *"not used"*.

IP # # # #

Enter 4 values of the destination IP address e.g.:

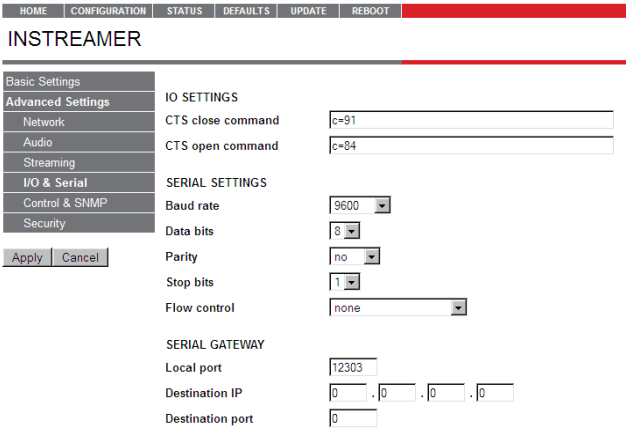
- *"0.0.0.0" with connection type set to UDP. The stream will be broadcast to the local broadcast address e.g. to "192.168.0.255".*
- *"0.0.0.0" with connection type set to TCP and a Port number defined. A TCP listener waiting for a connection from a streaming device.*
- *"0.0.0.0" with connection type set to Internet radio or Shoutcast. This listens to a TCP HTTP request.*
- *"0.0.0.0" for unused destinations*
- *"192.168.0.34"* for a directed connection
- *"192.168.0.255"* for a broadcast

Default settings are *"Internet Radio 0.0.0.0:0"*.

Port #

Enter the port number for each destination (between *0* and *65535*). If this port is set to *0* then the default ports are used (Internet Radio *80*, TCP *2020*, UDP *3030*). For Shoutcast, enter the base port (the lower one, the same as clients put into their radio players).

3.6 I/O and Serial Settings



I/O SETTINGS

Configure which of the commands below should be issued when the CTS signal on the serial connector is activated

CTS close command

Configures which command should be issued when the CTS signal on the serial connector is activated

CTS open command

Configures which command should be issued when the CTS signal on the serial connector is deactivated

Commands

Commands can be joined using the "&" character and will be executed sequentially. For further commands refer to the "Instreamer technical documentation".

SENDING MODE
c=84 : Deactivate the sending mode, if not send always
c=91 : Activate the sending mode

SERIAL
c=89 : Simulate the CTS Signal being activated
c=90 : Simulate the CTS Signal being deactivated
c=60 : Activate the RTS Signal
c=61 : Deactivate the RTS Signal

For further commands refer to the technical documentation available on www.barix.com.

SERIAL SETTINGS

When the serial port is not being used as a Serial Gateway it defaults to a command interface.

Baud rate

Select the serial transmission speed (*"300"* to *"115200"* Baud).
Default: *"9600"*

Data bits

Select *"7"* or *"8"* data bits.
Default: *"8"*

Parity

Select *"no"*, *"even"* or *"odd"* parity.
Default: *"no*

Stop bits

Select *"1"* or *"2"* stop bits.
Default: *"1"*

Flow control

Select the type of flow control: *"none"*, *"Software (XON/XOFF)"* or *"Hardware (RTS/CTS)"*.
Default: *"none"*

SERIAL GATEWAY

The Serial Gateway function allows the establishment of a serial connection between two devices over a LAN or WAN.

To enable the Gateway function "Destination IP" and "Destination port" are set at the initiator (active) device. At the receiver (passive) device the "Local port" is set to the partner's "Destination port".

On power up the active device connects to the passive device and tries to reconnect automatically if the connection is lost. If the connection is successful serial data can be passed end-to-end across the network.

Local port

Defines the port on which the serial interface can be accessed for serial gateway applications. Only when "Local port" is set to *"0"* can the serial interface be used as a command interface.
If Destination IP is nonzero and the "Local port" is set to a value then this will be the source port of the TCP connection. If the Destination IP is nonzero and "Local port" is *"0"* a random source port is used.
Default: *"12303".*

Destination IP

To have this Barix Instreamer actively establish a serial gateway select the destination IP address of the device with which serial data will be exchanged. Select *"0.0.0.0"* to disable the gateway and use the serial interface locally only.
Default: *"0.0.0.0"* (disabled).

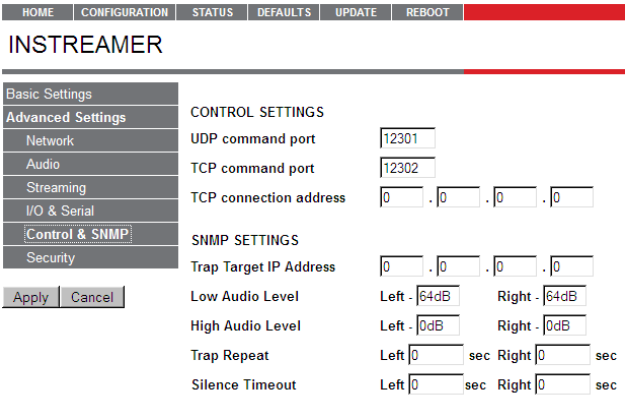
Destination port

Defines the port for the active serial gateway function (see destination IP).
Default: *"0"* (disabled)

Note:

When the Serial Gateway function is activated the serial port on both devices cannot be used as a command interface.

3.7 Control and SNMP settings



CONTROL SETTINGS

As well as the CGI WEB commands available over http, the Instreamer offers two dedicated remote control interfaces: UDP and TCP. See the Technical Documentation for more details about the protocol.

These settings adjust the control port properties.

UDP command port

Configure a port number between 1 and 65535 to enable the UDP command interface.
Enter 0 to disable the UDP command interface.
Default: *"12301"*

TCP command port

Configure a port number between 1 and 65535 to enable the TCP command interface.
Enter 0 to disable the TCP command interface.
Default: *"12302"*

TCP Connection address

If 0.0.0.0, a listening command port is opened. Otherwise a TCP connection is actively attempted at the given address and port. If the connection fails, it is reattempted every minute. Default:*0.0.0.0*

SNMP SETTINGS

SNMP traps are configured in this parameter group. The traps are sent to the “Trap Target IP Address”. The Standard Cold Start trap is sent on re-boot.

Two additional specific traps for left and right Audio levels can be configure. The traps are triggered according to specific audio values as described below. Note that audio levels can only be monitored for analogue audio inputs.

Trap Target IP Address

Enter the IP address of the SNMP trap destination.

Low Audio Level

Define the low audio level for the trap which will be generated as soon as the audio level goes below this value (and the “Silence timeout” has expired).

High Audio Level

Define the high audio level for the trap which will be generated as soon as the audio level goes above this value.

Trap Repeat

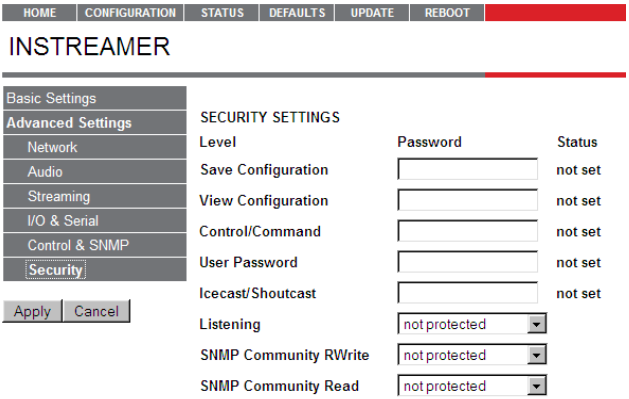
Define the SNMP trap repeat interval. The trap is repeated if the audio level values are still out of range.

Silence Timeout

Define the time interval for sending a trap after the low audio level is detected.

3.8 Security settings

These settings are used to secure access to the device on different levels. The status is shown next to each password (*"set"* or *"not set"*). Access is open for levels without a password (default setting).



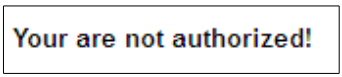
Save Configuration

Enter up to 24 characters to secure the saving of the device configuration (Clicking the "Apply" button). Without a valid password the device configuration can not be saved!
Enter 25 characters to erase the current password.
Default: *"not set"*

Save configuration password usage

When the password is set the user has to type in the password in the "Save Config Password field" before hitting the "Apply" button.

Without a valid password a warning will be displayed and the changes will not be saved.

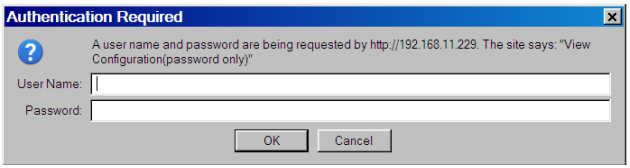


View configuration

Enter up to 24 characters to secure the viewing of the device configuration (Clicking the “Config” button).
Without a valid password the device configuration cannot be viewed! Enter 25 characters to erase the current key.

View configuration password usage

When the password is set the user clicking on the “Config” button has to type in the password into the password field of the pop up window (the user name does not matter).



Only one user can log in at a time, in which case further attempts are refused.

To log out click on the “Logout” link at the top right of the page.

Control / Command

Enter up to 24 characters to secure the access to all control and command interfaces (WEB/CGI, Serial, TCP and UDP). Without a valid password the device cannot be controlled. Enter 25 characters to erase the current key.

Note : This security option should be used very carefully and is intended for advanced users only. Since the CGI commands used in the web interface do not make use of passwords, setting this password would disable any control of the device using a browser.

User Password

Enter up to 24 characters to secure the access to customized web pages. Intended for advanced users only, for details see the Technical Documentation. Without a valid password these user web pages cannot be viewed.
Enter 25 characters to erase the current password.
Default: *"not set"*

Icecast/Shoutcast

Enter up to 24 characters. This is the password the device uses when accessing Icecast or Shoutcast server and acting as a source. Applies only for "Icecast source" or "Shoutcast source" streaming option selected. When 25 or more characters entered, the password is erased.

Listening

Choose which level is used for preventing unauthorized listeners from listening to the Instreamer in Internet Radio mode, or "not protected" for access for all.

SNMP Community RWrite

Choose a password for the Read and Write Community, or "not protected" to ignore both the read and write communities or "no write access"

SNMP Community Read

Choose a password for the Read Community, or "not protected" to ignore the read community or "no access"
Note that the Community RWrite setting takes priority. This means that if the Community RWrite is set to not protected, Community Read is ignored.

3.9 Additional Features

From V3.17 two xml files are added to provide a *LiveFeed Service* for Cisco's Call Manager.

For the Call Manager settings please refer to the relevant Cisco documentation. The Service URL to configure is:

```
http://<Instreamer IP address>/livefeed.xml.
```

So in the example below this would be:

```
http://192.168.11.171/livefeed.xml.
```

livefeed.xml

To use this feature configure the Instreamer 5th Streaming Destination for RTP <IP address> <port number>.

The IP address and port from the 5th Streaming Destination and the Instreamer device's own IP address are dynamically inserted into the livefeed.xml file.

An example of the resulting XML is as follows:

```
<CiscoIPPhoneExecute>
<ExecuteItem URL="RTPMRx:239.1.1.25:20480"/>
<ExecuteItem URL="http://192.168.11.170/listen.xml"/>
</CiscoIPPhoneExecute>
```

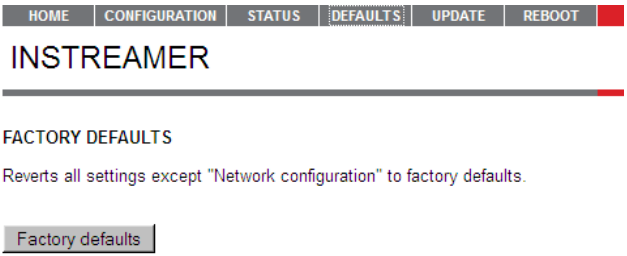
listen.xml

The Instreamer Own Name is copied to the Title in the listen.xml file as in the following resulting XML example:

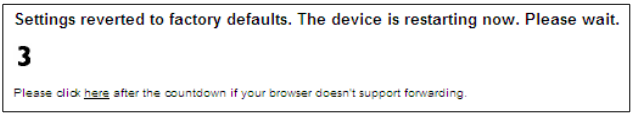
```
<CiscoIPPhoneText>
<Title>Instreamer_1</Title>
<Prompt>Press Exit to stop listening</Prompt>
<Text>Live audio streaming...</Text>
<SoftKeyItem><Name>Exit</Name>
<URL>SoftKey:Exit</URL>
<Position>1</Position>
<URLDown>RTPRx:Stop</URLDown>
</SoftKeyItem>
</CiscoIPPhoneText>
```

4 Reverting to factory defaults

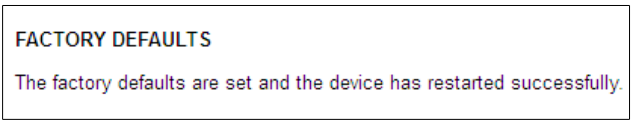
Click on the Defaults button to enter the defaults page. You will see the following screen:



Click on "Factory defaults" to revert all settings except "Network configuration" to factory defaults. While restarting the device the following screen appears showing a number counting down:



Upon start up the following screen appears stating the successful reversion to factory defaults:



Hard default settings

To revert all settings (including the network settings) to factory defaults the "Reset" button has to be pressed for about 5 seconds while the Barix Instreamer is powered.

Note: You can use this method if a connection to the Barix Instreamer cannot be established.

This can happen if you once have set a Static IP address, switched off “SonicIP” and then forgotten the IP address.
The Hard default settings sets the IP Address to automatic discovery (0.0.0.0) and enables SonicIP.

We also recommend downloading and installing the Barix Binary Discovery Tool from:
http://www.barix.com/downloads/downloads-firmware/software-tools/

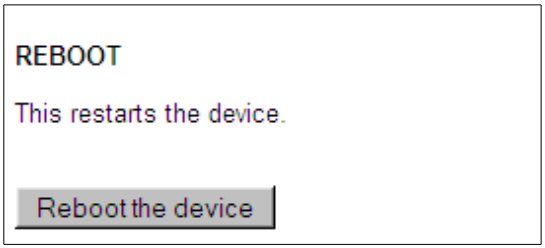
If the tool is installed on a PC, a target device, on the same subnet, can be discovered even if the IP address is invalid. The IP address can be corrected and the device put back into service.

If this fails we recommend to download the “Instreamer Rescue Kit” from www.barix.com. Unzip the Kit and read “readme1st.txt” for instructions.
This Rescue Kit reloads the entire firmware, resets the device to factory default settings using the supplied serial cable and a PC running Windows XP/2000/NT, Linux or MAC.

5 Rebooting the device

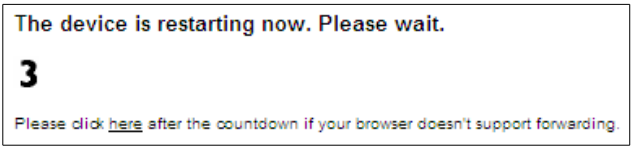
Click on the REBOOT button to enter the reboot page.

You will see the following screen:

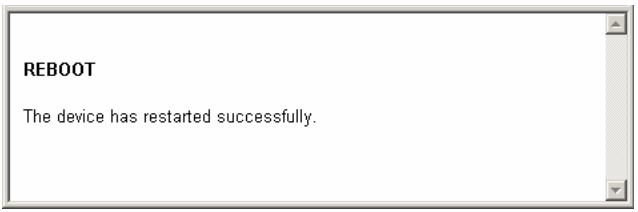


Click "Reboot the device" to restart the Barix Instreamer.

While restarting the device the following screen appears showing a number counting down:



Upon start up the following screen appears stating the successful restart:



6 Updating the device

Barix preloads the Instreamer devices with firmware which is current at the day of production.

Barix constantly enhances the capabilities and functions and recommends to keep the firmware on the Barix Instreamer up-to-date.

Barix recommends the use of the “Serial Rescue” method to update the firmware.

For the alternative method “Web Update” the “Web server port” has to be set to “0” or “80” to work properly (0 will set the default port “80”).

If the web update is interrupted during the process (power or network loss) the device might become unreachable. In that case the “Serial Rescue” procedure is the only remedy. Please keep that in mind when planning a remote update.

6.1 Downloading the latest firmware

To download the latest “Instreamer” firmware version please visit www.barix.com.

- On the menu at the top click on Downloads
- Under Firmware Download select “Instreamer Standard Firmware”.
- Select the Instreamer FW Kit to download it.
- Save the ZIP file and unpack it to a local drive.

Read the "_readme1st.txt" file for detailed instructions.

6.2 Serial Rescue

The "Serial Rescue" procedure loads the entire firmware and resets the device to factory default settings (current configuration is overwritten).

It is therefore helpful to note the current setting. Printing out the "status" page is the quickest way as the page contains all configuration parameters. Open your web browser and type in the IP address of the Barix device in the URL field and hit the "Enter" key. Press the STATUS button.

To apply the Rescue using a serial cross cable and a PC running Windows, Linux or a MAC follow the steps in the "_readme1st.txt" carefully as there are a number of different options available.

Allow approximately 2 minutes to complete the "Serial Rescue" procedure. After a successful rescue the device is ready for configuration according to your needs
(see chapter 3_Device Configuration).

6.3 Web Update

To apply the "Web Update" procedure you will need a standard web browser and the IP address of the device (announced by the SonicIP feature).

Make sure that the "Web server port" is set to "80" before starting the procedure.

The upload itself will take about 10 seconds.

STEP 1
Open your web browser

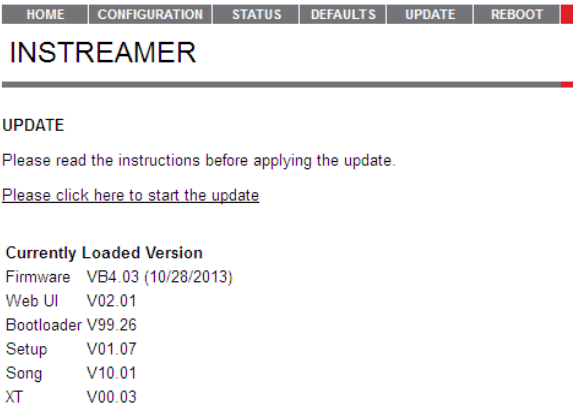
STEP 2
Type in the IP address of the Barix device and press Enter:

- Example: “192.168.0.12”

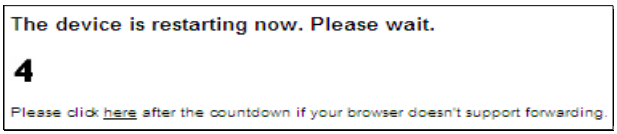
STEP 3
Click the CONFIGURATION button.

STEP 4
Click on the UPDATE button to enter the update page.

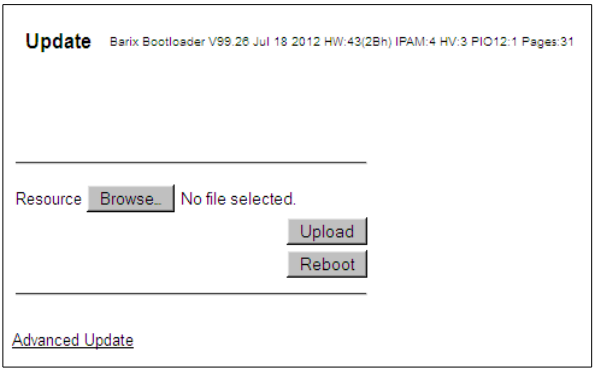
You will see the following screen:



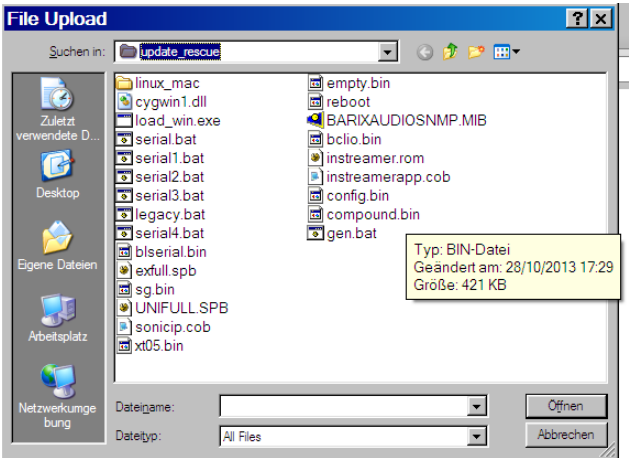
STEP 5
Click on “Please click here to start the update” to launch the update process. The device will restart in a special mode called “Boot loader” and the following screen appears showing a number counting down from 4 to 0.



Upon start up the following screen appears. The Bootloader version and date will most likely be different. The other information provides numeric values for HW type and IPAM type, some HW register data which can be ignored and gives the total number of uploaded Flash pages:



STEP 6
Click on "Browse..." to select the file you want to update.



The file is named compound.bin located in the folder “update_rescue”.

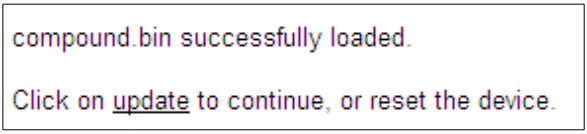
Select the file and click on the “Open” button.

STEP 7
Attention: If you load the wrong file the device will not work and you may only be able to recover by applying the “Serial Rescue Procedure”.

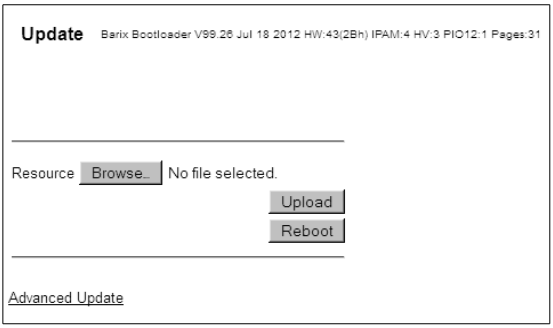
Click on “Upload” to start the upload process which takes approximately 10 seconds.

Warning:
If the web update is interrupted during the process (power or network loss) the device might become unreachable. In that case the “Serial Rescue” procedure is the only remedy. Please keep that in mind when planning a remote update.

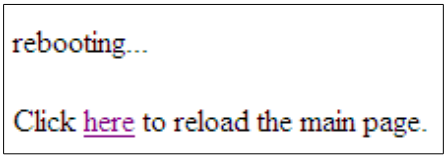
After a successful upload the following window appears:



STEP 8
Click on the update link and then click on the "Reboot" button in the following window:



The following screen appears:



STEP 9
After the device has rebooted click on the “here” link to reload the main page.

The device is now ready for configuration according to your needs (see chapter 3_Device Configuration).

Note: The “Web Update” procedure does not change the current configuration. Barix recommends nevertheless checking for correct parameters in the configuration as well as to set parameters for newly added features.
If you observe strange behavior after an update Barix recommends resetting the configuration to factory defaults by keeping the Reset button pressed until the red LED starts blinking (approx. 10 seconds) and to start over with the configuration of the device.

7 Dictionary

DHCP	Short for Dynamic Host Configuration Protocol, a protocol used to assign an IP address to a device connected to a Network.
IP	Short for Internet Protocol, the IP is an address of a computer or other network device on a network using IP or TCP/IP. Every device on an IP-based network requires an IP address to identify its location or address on the network. Example: 192.168.2.10
IPzator	Barix IPzator™ technology is designed for the purpose that the Barix device can create its own IP address according to the network structure in case it can't receive one from your network. If DHCP, AUTOIP or BOOTP fail, IPzator will create an IP address within the subnet and test it. If the address works and is not being used by another device on the network, it will give the address to the Barix device.
MAC address	Abbreviation for Medium Access Control, a MAC is a unique address number formatted in hexadecimal format and given to each computer and/or network device on a computer network. Because a MAC address is a unique address a computer network will not have the same MAC address assigned to more than one computer or network device. Example: A1:B2:C3:D4:E5:F6
Netmask	A number used to identify a sub network so that an IP address can be shared on a LAN (Local Area Network). A mask is used to determine what subnet an IP address belongs to. An IP address has two components, the network address and the host address. For example, consider the IP address 150.215.17.009. Assuming this is part of a Class B network, the first two numbers (150.2) represent the

	Class B network address, and the second two numbers (.017.009) identify a particular host on this network. The Netmask would then be 255.255.0.0 .
Ping	Ping is a basic Internet program that lets you verify that a particular IP address exists and can accept requests. Example: ping 192.168.2.10
SonicIP	Barix SonicIP ® technology is designed to vocally announce the Barix devices current IP address. This makes it easier and faster to obtain the necessary network information. To make use of SonicIP plug in the included earphone into RCA audio out, connect the network and plug in the power supply. It will announce the address over the earphones right after power up.
Static IP	A Static IP is a fixed IP address that you assign manually to a device on the network. It remains valid until you disable it.
Telnet	Telnet is a user command and an underlying TCP/IP protocol for accessing remote computers. On the Web, HTTP and FTP protocols allow you to request specific files from remote computers, but not to actually be logged on as a user of that computer. With Telnet, you log on as a regular user with whatever privileges you may have been granted to the specific application and data on that computer. Example: telnet 192.168.2.10

8 Legal Information

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