BARIX
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SIP ZONE PAGING

Application User Manual

Sip Zone Paging system

SIP ZONE PAGING ABCL FW version	V1.1
Doc. release version	02.03.2018
BARIONET50_BRX_SS	V0111_20170302
SIP_BRX	V2.18t_20170302
BRX_PA	V0115_20170302

REVISION TABLE

Date	***Version***	***Who***	***Change***
02/02/2018	1	GT	First version
02/03/2018	1.1	GT	Corrected PS16 keyboard layout

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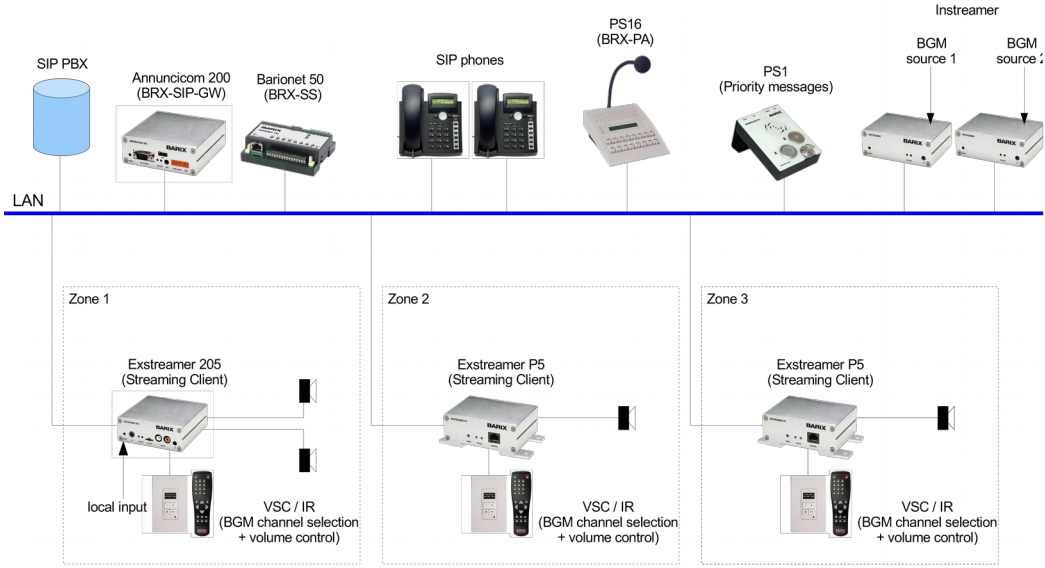
1 Introduction

1.1 About “SIP ZONE PAGING”

SIP ZONE PAGING is a fully functional solution for building paging systems over IP-based networks with SIP integration. With SIP ZONE PAGING, BARIX devices can be easily configured and become part of the paging system, integrated with SIP phone system, in few minutes.



Being designed with a server/client architecture, the SIP ZONE PAGING application is configured to run on Barionet 50 (server), on PS16 (Paging Station) and on Annuncicom 200 (SIP Gateway).
As zone player can be used any Exstreamer/Annuncicom device with BGM Client firmware or Streaming Client firmware.

1.2 **Features**

- server / client architecture
- maximum 8 Paging Station (PS16) / SIP Gateway (Annuncicom 200) devices
- 90 zones maximum (multicast/unicast)
- 10 zones + All Zones callable from Paging Station (PS16)
- 10 + 80 zones + All Zones callable from SIP phones
- 7 zones concurrent paging from SIP Phones
- busy zone indication by led (PS16) and SIP Messages (SIP Phone).
- chime tone
- optional Background Music and priority message support on zone player (with BGM Client firmware or Streaming Client firmware).

1.3 Supported hardware

The SIP ZONE PAGING solution is designed to run on the following Barix devices:

- Barionet 50 (BRX_SS firmware)
- PS 16 (BRX_PA firmware)
- Annuncicom 200 (BRX_SIP firmware)
- Exstreamer 1xx/2xx/500/P5 (Zone Player with BGM Client firmware or Streaming Client firmware)

1.4 Additional documents

Technical specifications for the supported devices can be found in the corresponding product sheet which can be downloaded from www.barix.com.

2 Running SIP ZONE PAGING

2.1 Firmware installation

Install the firmware following the Update procedure from WEB UI (see *readme1st.txt* inside the firmware package).

Install the file as per below:

- *barionet50_brx_ss_vxxx.bin* on Barionet 50
- *abcl_brx_pa_vxxx.bin* on PS16
- *abcl_sip_brx_vxxx.bin* on Annuncicom 200
- Streaming Client or BGM Client (*compound.bin)* on Zone Player

After update perform a “Factory Defaults Reset”.

2.2 Barionet 50 configuration

The Barix Status Server (BSS) is the main component from the Barix SIP Zone Paging system and it’s responsible for maintaining the status of the Paging Stations (the 4 PS16 and the 4 SIP Gateway devices) and the selected zones, and distributing it to the paging stations to keep them in sync.

2.2.1 Network

IP Address
Enter the 4 values of the desired device IP address e.g.: "0.0.0.0" for automatic discovery (DHCP/Bootp, IPzator, AutoIP), or a specific IP for an internal LAN.
Default: 0.0.0.0

Netmask
Enter the 4 values of the desired Static IP e.g.:"0.0.0.0" for a default Netmask depending on the used IP Address. "255.255.255.0" for a C class network

Gateway IP Address
Enter the 4 values of the desired Gateway IP address e.g.: "0.0.0.0" for no Gateway, or the IP of the gateway in your LAN
Note: The Gateway has to be set only when connecting to other devices over the WAN (through a router).
Default: 0.0.0.0

DNS server
In this field you can give the desired primary and alternative DNS IP address to be able to connect to URLs (e.g. www.radio.com). Example: "195.186.1.111"
Default: 0.0.0.0

DHCP Host Name
Name of the device sent in DHCP request. If left empty, a name based on the device's MAC address is generated automatically. Enter up to 15 Characters.

2.2.2 **Application Setup**

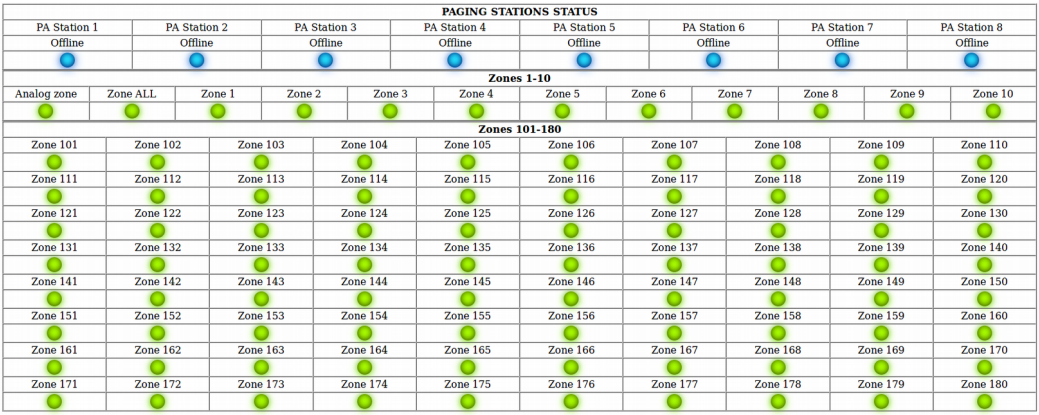
Status Messages Address
Configure here the address to which the Paging Stations shall listen for status messages sent by the Barix Status Server.
Default: 224.1.3.55:6667

Request Messages Address
Configure here the address to which the Barix Status Server is listening for request messages from the Paging Stations.
Default: 224.1.2.55:6666

Debug Messages
Enable or disable debug syslog messages to be broadcasted. Use this feature only when experiencing problems.
Default: Disabled

2.2.3 **Status page**

In the status page it's possible to see in real-time the status of Paging Station / SIP Gateway (Offline/Idle/Selecting/Paging) and of zones (free/selecting/busy).



PAGING STATIONS STATUS							
PA Station 1	PA Station 2	PA Station 3	PA Station 4	PA Station 5	PA Station 6	PA Station 7	PA Station 8
Offline	Offline	Offline	Offline	Offline	Offline	Offline	Offline

Zones 1-10										
Analog zone	Zone ALL	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10

Zones 101-180									
Zone 101	Zone 102	Zone 103	Zone 104	Zone 105	Zone 106	Zone 107	Zone 108	Zone 109	Zone 110
Zone 111	Zone 112	Zone 113	Zone 114	Zone 115	Zone 116	Zone 117	Zone 118	Zone 119	Zone 120
Zone 121	Zone 122	Zone 123	Zone 124	Zone 125	Zone 126	Zone 127	Zone 128	Zone 129	Zone 130
Zone 131	Zone 132	Zone 133	Zone 134	Zone 135	Zone 136	Zone 137	Zone 138	Zone 139	Zone 140
Zone 141	Zone 142	Zone 143	Zone 144	Zone 145	Zone 146	Zone 147	Zone 148	Zone 149	Zone 150
Zone 151	Zone 152	Zone 153	Zone 154	Zone 155	Zone 156	Zone 157	Zone 158	Zone 159	Zone 160
Zone 161	Zone 162	Zone 163	Zone 164	Zone 165	Zone 166	Zone 167	Zone 168	Zone 169	Zone 170
Zone 171	Zone 172	Zone 173	Zone 174	Zone 175	Zone 176	Zone 177	Zone 178	Zone 179	Zone 180

2.3 PS16 Paging Station configurations

2.3.1 Network

Use SonicIP
If set to "yes", the device will announce its IP address over the audio output when the device boots up.
Default: yes

IP Address
Enter the 4 values of the desired device IP address e.g.: "0.0.0.0" for automatic discovery (DHCP/Bootp, IPzator, AutoIP), or a specific IP for an internal LAN.
Default: 0.0.0.0

Netmask
Enter the 4 values of the desired Static IP e.g.:"0.0.0.0" for a default Netmask depending on the used IP Address.
"255.255.255.0" for a C class network

Gateway IP Address
Enter the 4 values of the desired Gateway IP address e.g.: "0.0.0.0" for no Gateway, or the IP of the gateway in your LAN
Note: The Gateway has to be set only when connecting to other devices over the WAN (through a router).
Default: 0.0.0.0

Primary DNS
In this field you can give the desired primary and alternative DNS IP address to be able to connect to URLs (e.g. www.radio.com). Example: "195.186.1.111"
Default: 0.0.0.0

Alternative DNS
In this field you can type the desired alternative DNS IP address in case the primary DNS is not reachable.
Example: "195.186.4.111"
Default: 0.0.0.0

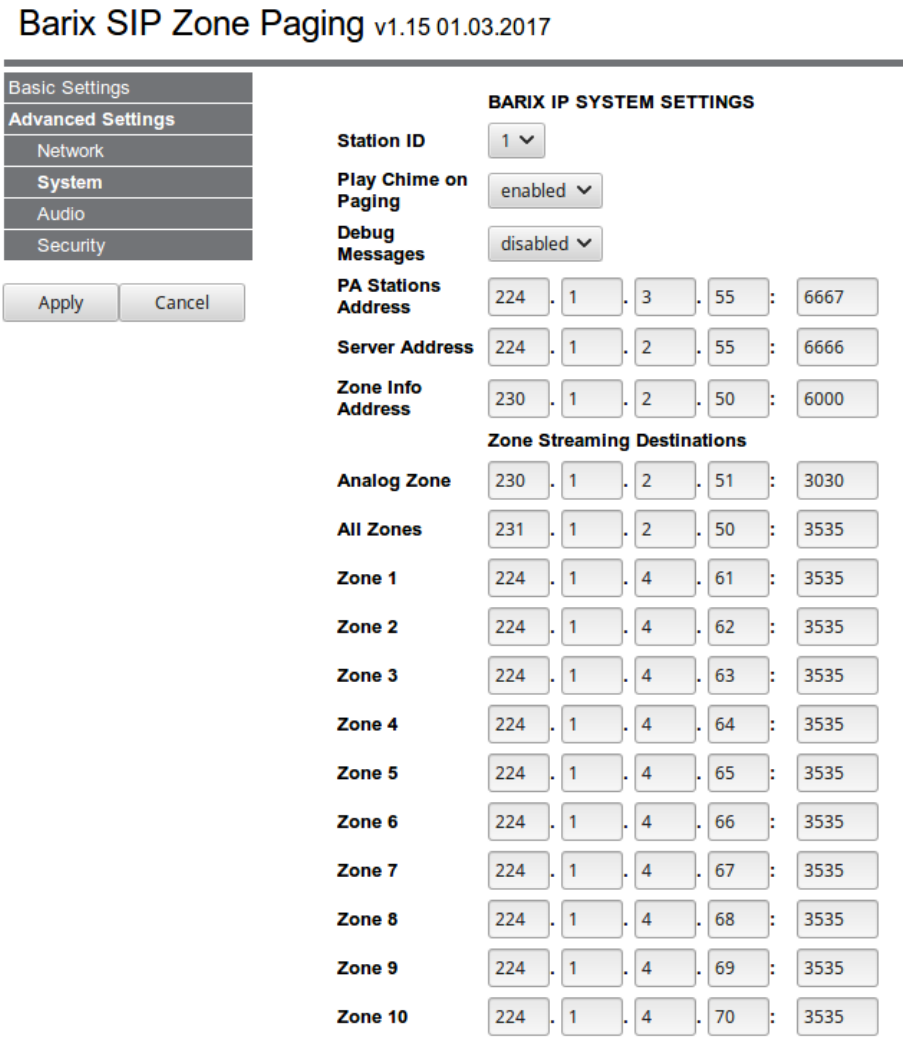
Syslog Address
Destination address for syslog messages sent by the BCL program via the SYSLOG command. Set this to your syslog logging machine, if your syslog messages are recorded centrally.
If set to 0.0.0.0, syslog messages are broadcasted.
Default: 0.0.0.0

DHCP Host Name
Name of the device sent in DHCP request. If left empty, a name based on the device's MAC address is generated automatically. Enter up to 15 Characters.

Web server port
Defines the port where the web server of the device can be reached. If set to "0" the default HTTP port (80) is used.

Default Ethernet Port
On devices with dual-ethernet connection this parameter selects the default port to be used. In most cases selecting ETH1 is suitable. Note that for the PS16, the PoE (Power-over-Ethernet) functionality is provided on the ETH2 connector for old device hardware versions only, otherwise, on new hardware, PoE is located on the ETH1 connector.
If you change this parameter do not forget to connect the ethernet cable to the proper port on the rear of the device.
NOTE: on devices with a single ethernet port select always ETH1. Selecting ETH2 makes the device inaccessible!
Default: ETH1

2.3.2 **System**


Barix SIP Zone Paging v1.15 01.03.2017
Basic Settings
Advanced Settings
Network
System
Audio
Security
Apply
Cancel
BARIX IP SYSTEM SETTINGS
Station ID
1
Play Chime on Paging
enabled
Debug Messages
disabled
PA Stations Address
224 . 1 . 3 . 55 : 6667
Server Address
224 . 1 . 2 . 55 : 6666
Zone Info Address
230 . 1 . 2 . 50 : 6000
Zone Streaming Destinations
Analog Zone
230 . 1 . 2 . 51 : 3030
All Zones
231 . 1 . 2 . 50 : 3535
Zone 1
224 . 1 . 4 . 61 : 3535
Zone 2
224 . 1 . 4 . 62 : 3535
Zone 3
224 . 1 . 4 . 63 : 3535
Zone 4
224 . 1 . 4 . 64 : 3535
Zone 5
224 . 1 . 4 . 65 : 3535
Zone 6
224 . 1 . 4 . 66 : 3535
Zone 7
224 . 1 . 4 . 67 : 3535
Zone 8
224 . 1 . 4 . 68 : 3535
Zone 9
224 . 1 . 4 . 69 : 3535
Zone 10
224 . 1 . 4 . 70 : 3535

Station ID
Set the ID (1-8) of the Barix Paging Station. Usually IDs 1-4 are used for PS16 Paging Stations, IDs 5-8 are used for SIP Gateway Paging Stations, but this can be always reassigned.
Default: 1 (PS16 Station 1)

Play Chime on Paging
Enable or disable the chime to be send to the Zone Players when the paging starts.
Default: enabled

Debug Messages
Enable or disable more verbose messages to be sent to the network via syslog.
Default: disabled

PA Stations Address
Configure here the address to which the Paging Stations shall listen for status messages sent by the Barix Status Server.
Default: 224.1.3.55:6667

Server Address
Configure here the address to which the Barix Status Server is listening for request messages from the Paging Stations.
Default: 224.1.2.55:6666

Zone Info Address
Set the address to which the Paging Stations shall send SDP messages with their zone selection.
Default: 230.1.2.50:6000

All Zone Address
Set the IP and port to which all the zones are listening to. The RTP stream sent to this address will be received by all zones.
Default: 231.1.2.60:3535

Zones 1-10 Address
Set individual IP and port for IP zones 1-10.
Default: 224.1.4.61-70:3535

2.3.3 **Audio**

Encoding
Choose between different encoding types and sampling frequencies ("µ-law" or "A-law" at 8 or 24 kHz).
Default setting is "µ-law 8 kHz".

Microphone Gain
Microphone gain dB, increase if your microphone is too faint, decrease if it's too loud or overdriven.
Default: "21 dB".

A/D Amplifier Gain
A/D converter preamplification in dB. Increase if the audio signal too faint, decrease if it's too loud or overdriven.
Default: "0 dB".

2.3.4 **Security**

Reset Function
Enable or disable the "Reset" function on the Reset button and on the WEB UI. In order to restart the device press the Reset button once.
Default: "enabled".

Factory Defaults
Enable or disable the "Factory Defaults" function on the Reset button. In order to revert all settings to factory defaults keep the Reset button pressed until the red LED starts blinking (approx. 10 seconds).
Default: "enabled"

Update Function
Enable or disable the WEB Update function of the device. If the Update function is disabled, the only way to update the firmware is to use the serial rescue.
Default: "enabled"

Set Password
This is visible as long as no password is set.
Enter a password (up to 25 characters) and hit the "Apply" button. After the restart you should close the browser window and open a new browser window. You will be asked to supply user name and password. The user name can be omitted but the password has to be supplied in order to see the web configuration.
Old Password / New Password

These fields are visible as long as a password is set.
To allow free access (clearing the password) enter the old password and leave the field "New Password" empty. Enter the old password in the password field above the "Apply" button as well and then hit the "Apply" button.
After the restart you will not be asked for user name and password anymore.
To change the password enter the old password and enter the new password in the field "New Password". Enter the old password in the password field above the "Apply" button as well and then hit the "Apply" button.
After the restart you will be asked for user name and password. The user name can be omitted but the new password has to be supplied in order to see the web configuration.

2.3.5 **Keyboard Layout**

The PS16 Paging Station has 16 functional buttons, a flexible microphone, speaker, and 2 line LCD.
The keys functions are the following:

Zone 1	Zone 2	Zone 3	Zone 4	Zone 5			Clear
Zone 6	Zone 7	Zone 8	Zone 9	Zone 10		All Zones	PTT

2.4 SIP Gateway configurations

2.4.1 Network

Use SonicIP
If set to "yes", the device will announce its IP address over the audio output when the device boots up.
Default: "yes”

IP Address
Enter the 4 values of the desired device IP address e.g.: "0.0.0.0" for automatic discovery (DHCP/Bootp, IPzator, AutoIP), or a specific IP for an internal LAN.
Default: "0.0.0.0"

Netmask
Enter the 4 values of the desired Static IP e.g.:"0.0.0.0" for a default Netmask depending on the used IP Address.
"255.255.255.0" for a C class network

Gateway IP Address
Enter the 4 values of the desired Gateway IP address e.g.: "0.0.0.0" for no Gateway, or the IP of the gateway in your LAN
Note: The Gateway has to be set only when connecting to other devices over the WAN (through a router).
Default: "0.0.0.0"

Primary DNS
In this field you can give the desired primary and alternative DNS IP address to be able to connect to URLs (e.g. www.radio.com). Example: "195.186.1.111"
Default: "0.0.0.0"

Alternative DNS
In this field you can type the desired alternative DNS IP address in case the primary DNS is not reachable.
Example: "195.186.4.111"
Default: "0.0.0.0".

Syslog Address
Destination address for syslog messages sent by the BCL program via the SYSLOG command. Set this to your syslog logging machine, if your syslog messages are recorded centrally.
If set to 0.0.0.0, syslog messages are broadcasted.
Default: "0.0.0.0".

DHCP Host Name
Name of the device sent in DHCP request. If left empty, a name based on the device's MAC address is generated automatically. Enter up to 15 Characters.

Web server port
Defines the port where the web server of the device can be reached. If set to "0" the default HTTP port (80) is used.

SNMP System Name
SNMP MIB entry for system name (system.sysName.0)

SNMP System Location
SNMP MIB entry for system location (system.sysLocation.0)

SNMP System Contact
SNMP MIB entry for system contact (system.sysContact.0)
This parameter can be queried using any SNMP browser but can not be updated.

2.4.2 SIP Protocol Settings

Peer to Peer
Choose whether peer to peer calls should be allowed.
NOTE:When using P2P, the device uses always the default SIP (port 5060) and RTP (port 5004) ports. Make sure the remote peer is configured to listen on the default ports as well.

SIP Server (PBX) / Remote Peer
Enter either the hostname/IP address of a SIP server, or of the remote peer.

Backup SIP Server (PBX)
Enter either the hostname/IP address of of the backup SIP server if you have one. In case when the main server is not available, the device will try to register to the second one.
NOTE:
The backup server shall be configured to require the same credentials as on the first one.

SIP ID
Enter the SIP ID (username) that has been created for this device.

SIP Password
Leave this field empty if the PBX doesn't require authentication.

SIP Display ID
Enter the description that you like to have displayed on the remote peer when ringing.

Authentication ID
Enter the Authentication ID given by your SIP provider to use for authentication (if it is different than the SIP ID). Most often you do not need to fill in anything, just leave it empty to use the SIP ID for authentication.

Listen SIP Port
Listening port for the SIP protocol messages. A value of 0 means a default value of 5060.

Listen RTP Port
Listening port for the RTP audio blocks. A value of 0 means a default value of 5004.

Default REGISTER Time
The value that the SIP client suggests to the SIP server when sending the REGISTER request. If this value is accepted by the SIP server, the SIP client has to register after this amount of time.
Allowed values in the range of 60-3600 seconds.
NOTE:
The SIP server may overwrite this value in its reply to the REGISTER request.

Send NAT-Keepalives
Enable this function if the device resides behind a NAT.

Periodically Renew DNS
If enabled, it will force the SIP client to renew the DNS of the SIP server every time the registration to the server fails. Use this feature if you have a backup SIP server with the same DNS name and you wish to enable the SIP client to switch to it if the main server fails.
NOTE:
This option is mutually exclusive with the "Backup SIP Server (PBX)" setting. When this option is enabled, it will prevent the SIP client from switching to the backup SIP server, and it willstay to the one that has been selected at boot time. In this case the SIP client will keep on resolving the same SIP server name.

Registration Fail Timeout
The SIP client will automatically resolve the DNS of the SIP server if the REGISTER request
fails. However, if the SIP server is down, or the REGISTER message gets lost, the SIP client will not get reply from the server. So configure here the timeout after sending a REGISTER request on the expiry of which the registration will be considered as "failed" in case of no reply from the SIP server.
NOTE 1:
Use this feature with caution. Setting this value too low may result in registration malfunctioning. If unsure, leave it to the default value.
NOTE 2:
This timeout is shared with the "Backup SIP server (PBX)" setting.
Default: 10 seconds

Call Timeout
Enter here in minutes (1-255) the maximum time duration of the call. After the expiry of this timeout the call will be unconditionally closed.
Default: 0 (disabled)

Debug Mode
Sends received or sent SIP messages through Syslog.

2.4.3 **Barix IP System Settings**

Station ID
Set the ID (1-8) of the Barix Paging Station. Usually IDs 1-4 are used for PS16 Paging Stations, IDs 5-8 are used for SIP Gateway Paging Stations, but this can be always reassigned.
Default: 5 (SIP Station 1)

Play Chime on Paging
Enable or disable the chime to be sendt to the Zone Players when the paging starts.
Default: enabled

Server Address
Configure here the address to which the Barix Status Server is listening for request messages from the Paging Stations.
Default: 224.1.2.55:6666

PA Station Address
Configure here the address to which the Paging Stations shall listen for status messages sent by the Barix Status Server.
Default: 224.1.3.55:6667

Zone Information Address
Set the address to which the Paging Stations shall send SDP messages with their zone selection.
Default: 230.1.2.50:6000

2.4.4 **Inbound Calls**

Input Buffer Level
Maximum delay of the input audio buffer in milliseconds. Decrease this value to minimize delay, increase this value to prevent audio dropouts.
Default: 300 ms.

Stream Timeout
In some scenarios the remote party may go offline without explicitly closing the active call. In this case the SIP client may stay in active call state for unlimited amount of time. Set here the time in minutes after which the SIP client will close the active call if there is no audio stream received. You can change between 0 and 600 minutes.
Default: 0 min (disabled)

2.4.5 **Audio**

Encoding
Choose between "*uLaw*", "*aLaw*", or *G.722*.
NOTE:
The G.722 selection option is visible only if supported by the HW.
Default: uLaw

Volume
Choose between "*0%*" and "*100%*" in 5% steps.
Default: 50%

2.4.6 **Streaming**

Analog Zones Address
Set the IP address and port of the device feeding the analog audio amplifier for zones 1 to 10. When the analog "zone" is free, a Paging Station may send audio to it in addition to the IP players duplicating the analog zones 1 to 10.
Default: 230.1.2.51:3030

All Zone Address
Set the IP and port to which all the zones are listening to. The RTP stream sent to this address will be received by all zones.
Default: 231.1.2.50:3535

Zones 1-10 Address
Set individual IP and port for IP zones 1-10.
Default: 224.1.4.61-70:3535

Zones 101-180 Base Address
Set here the base IP and port for zone 101. The IP addresses of the zones 102-180 will be configured by incrementing the last 3 digits of the base address.
NOTE:
Make sure to set the last 3 digits of the base address not bigger than 153, otherwise the last zones addresses may be invalid.
Default: 224.1.4.71:3535

2.4.7 **Security**

Reset Function
Enable or disable the "Reset" function on the Reset button and on the WEB UI. In order to restart the device press the Reset button once.
Default: enabled

Factory Defaults
Enable or disable the "Factory Defaults" function on the Reset button. In order to revert all settings to factory defaults keep the Reset button pressed until the red LED starts blinking (approx. 10 seconds).
Default: enabled

Update Function
Enable or disable the WEB Update function of the device. If the Update function is disabled, the only way to update the firmware is to use the serial rescue.
Default: enabled

Set Password
This is visible as long as no password is set.
Enter a password (up to 25 characters) and hit the "Apply" button. After the restart you should close the browser window and open a new browser window. You will be asked to supply user name and password. The user name can be omitted but the password has to be supplied in order to see the web configuration.

Old Password / New Password
These fields are visible as long as a password is set.
To allow free access (clearing the password) enter the old password and leave the field "New Password" empty. Enter the old password in the password field above the "Apply" button as well and then hit the "Apply" button.
After the restart you will not be asked for user name and password anymore.
To change the password enter the old password and enter the new password in the field "New Password". Enter the old password in the password field above the "Apply" button as well and then hit the "Apply" button.
After the restart you will be asked for user name and password. The user name can be omitted but the new password has to be supplied in order to see the web configuration.

2.4.8 **Call handling**

The zone selection is made via DTMF after dialing.

Zones must be composed always with 3 digits; multiple zones (7 maximum) can be selected.

* for start paging; * as first selection for all call (e.g. *002005014** for zones 2, 5, 14; ** for all call).

Hangup to close the call.

SIP Messages (sent to the phone)

Select
(after answering) it's possible to digit zones

Speak
(after the chime) it's possible to speak

Busy X
Zone N is busy

2.5 Zone Player

2.5.1 BGM Client firmware

Barix Backgroung Music Client can be used as Zone Player inside SIP Zone Paging system.
It provides BGM with RTP, raw UDP, and MPEG-TS streams, with 10 channels selection and volume control by VSC (Volume Source Control) panel.

To get the firmware contact support@barix.com.

IMPORTANT NOTE:
On PA Station / SIP Gateway the All Zone Address must be set to the network broadcast address (e.g. 192.168.50.255).

BGM IP Address
Set the BGM listening address.

BGM Port
Set the BGM listening port. If this field is not 0, the BGM listening service is enabled. BGM service listen for a RTP-MP3 incoming stream.

BGM Number of Channels
Set here the number of the available BGM channels.

BGM Buffer
Set the BGM playback delay buffer in milliseconds.

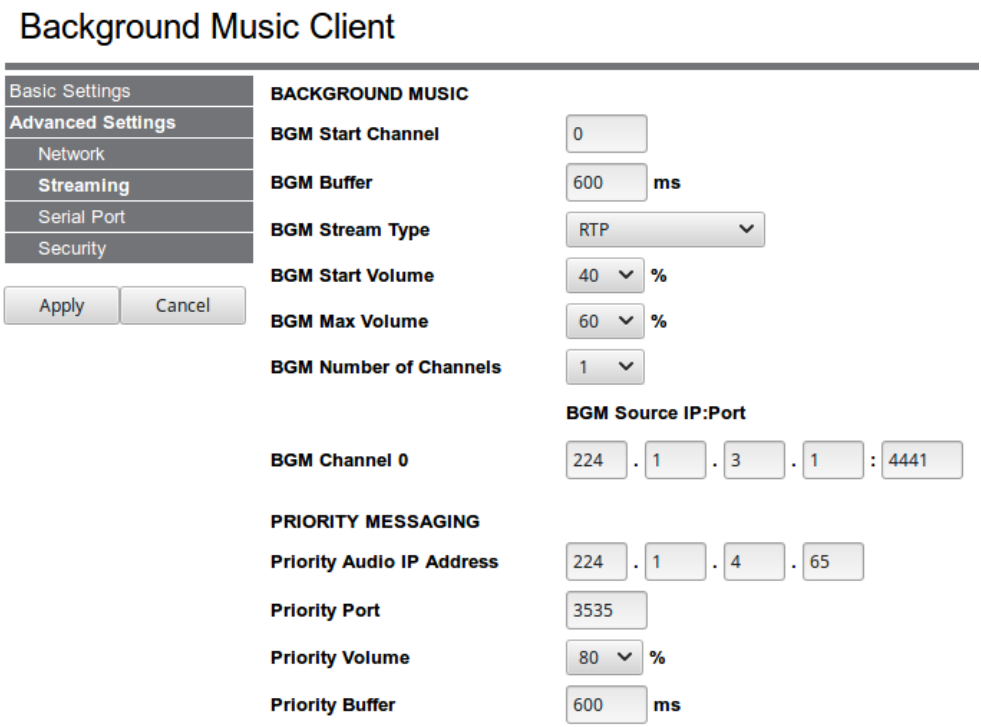
BGM Stream Type
Switch between *Raw UDP*, *RTP*, and *Raw UDP MPEG-TS* stream types

MPEG-TS PID
If you want to decode MPEG-TS stream, enter here the PID of the audio elementary stream you would like to play.
NOTE:
This option is visible only if "Raw UDP MPEG-TS" stream type is selected.

BGM Start Volume
Set the BGM playback volume at device start.

BGM Max Volume
Set the maximum BGM playback volume.

Here an example of configuration for Zone 5 with 3 RTP BGM channels (e.g. coming from 3 Barix Instreamer).

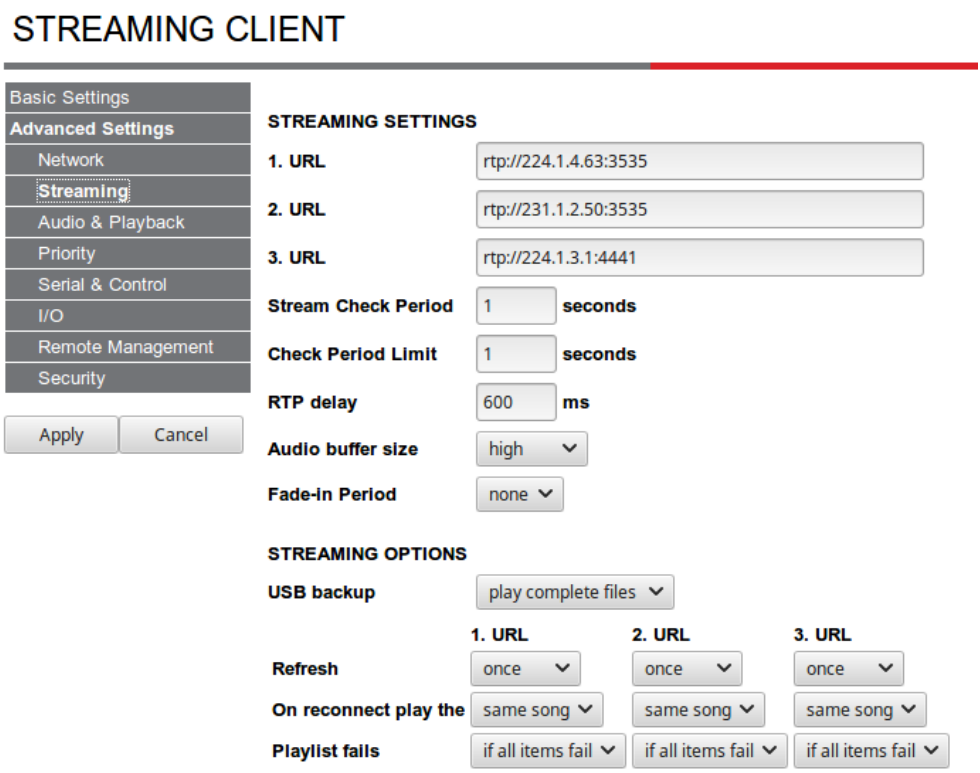


2.5.2 **Streaming Client firmware**

Barix Streaming Client can be used as Zone Player inside SIP Zone Paging system.
Using the switching URLs mechanism, can be configured to play BGM, in RTP/HTTP with channels selection.
It supports also Priority Stream (e.g. coming from Barix PS1) that is played with highest priority.

To get the firmware see the download section at www.barix.com.

Here an example of configuration for Zone 3 with RTP BGM (e.g. coming from an Instreamer).



3 Legal Information

For information about our devices and the latest version of this manual please visit www.barix.com.

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