



Messaging / Music On Hold

Client User Guide

# Table of Contents

## MOH Technology MOH Client User Guide

1	Introduction.....	4
1.1	The overall MOH system.....	4
1.2	A bit about Barix hardware and ABCL.....	5
1.3	Features of the Client application.....	5
2	Hardware Installation.....	6
2.1	Prerequisites.....	6
2.2	MOH Client.....	6
2.3	Triggered Messaging Client.....	6
3	Application configuration.....	8
3.1	Default CMS.....	8
3.2	Client web UI - basic.....	8
3.3	Client web UI – advanced.....	12
3.3.1	Phone Home Details.....	15
3.3.2	Streaming Settings.....	16
3.3.3	Network Settings.....	17
3.4	Standalone player.....	18
4	Exchanging device configuration updates with central CMS.....	19
5	Legal Information.....	20



# 1 Introduction

## 1.1 The overall MOH system

MOH Technology have developed a system that can be used by service providers in the Messaging/ Music on Hold (MOH) industry to distribute on hold content to their customers using the internet.

The same system can also be used as a 'Triggered Messaging' system, where the local hardware is connected to an input trigger and local loudspeakers, for instance at an information booth in a museum, leisure facility or store.

The system comprises:

- a central 'content management' component (CMS), based around a web interface, where service providers upload content files and schedule them for distribution to multiple customer locations.
- a local application that runs on a Barix Exstreamer at each client location. The audio output of the Exstreamer is connected to the on hold audio input of the customer's telephone PBX, or to an information booth, depending upon the desired function. The same CMS can be used to support both MOH and Triggered Messaging points simultaneously. If the Customer has a SIP phone system, the Client can also provide the on-hold audio over the Network.

A MOH service provider (MSP) can choose either to pay monthly for a hosted service operated by MOH Technology, or they can buy the software outright and host it themselves.

This document describes the Client component of the system, a separate Guide gives more detail about the Central Content Management component of the system.

The MOH Client consists of a Barix IP Audio device and a special firmware, written by MOH Technology that runs on the Barix box.

On startup:

- the application checks its configuration and starts playing its audio, if configured as MOH, or waits for a trigger if configured for Triggered Messaging.
- The client contacts the central CMS, advising it of its current status and checking to see whether there are any audio or configuration updates to be applied.
- If there are updates, the client downloads them via HTTP and applies them. All the while, audio playback/triggering continues unaffected
- once the communication has completed, the device starts a countdown timer, when this expires, it contacts the server again.
- This behaviour loops 'forever'

The Client application supports a web UI which shows the current settings and status and provides a mechanism to update the configuration.

## **1.2 A bit about Barix hardware and ABCL**

Swiss company Barix AG manufacture a range of low cost, IP-enabled audio and control devices. Every device in the range has a standard application, which reflects the original function that the product was designed to fulfil. However, Barix quickly found that users were being extremely creative in the uses that they were putting the devices to: for example, intercoms were being used as audio monitors in public spaces, or even to stream Whale song from the seas around Antarctica!

Encouraged by such interest, Barix released their ABCL development environment, which enables users to easily program devices to suit their own needs. It is this ABCL environment that has allowed MOH Technology to develop their Messaging / Music on Hold distribution and playback system.

## **1.3 Features of the Client application**

- MOH playback for telephone systems
- Audio can be streamed onto the network as RTP or Raw TCP for use with VOIP (SIP) systems
- Triggered Messaging for information points
- Content update via internet connection
- Support for proxy control of internet access
- Standalone playback also supported
- Practically unlimited playback filesize – GB, not MB
- Playback continues whilst content is updated
- Simple installation – devices can be installed by non-technical staff
- Device configuration can be updated from the centre
- All devices update the central application with their status
- Clients pull updates from centre, with a configurable frequency
- Updates can be active within minutes
- Playback can be disabled from the Central CMS

## 2 Hardware Installation

### 2.1 Prerequisites

There must be a network connection and power socket close enough to the PBX to allow the Exstreamer to be installed sensibly (no trailing wires!).

If the local network supports DHCP and DNS, the device will self configure on power up and connection to the CMS. Most ISPs these days support DHCP and DNS as part of their standard DSL offerings. If the network does not support DHCP and DNS, the configuration of the Network settings will be more work, key settings will need to be configured via the Exstreamer's web UI.

### 2.2 MOH Client

The Barix Exstreamer 100 is used to provide MOH functionality: order the device with the MOH application preloaded: this saves the customer the work of reprogramming the device from its standard firmware.

Physically, the install steps are simple:

1. Connect the device to the local network
2. Connect the RCA outputs to the MOH audio input of the PBX, using a suitable cable.
3. Insert a blank, formatted USB stick: FAT 16/32 (Exstreamer 100,110), or a blank mini SD card (Exstreamer 120)
4. Plug in a set of headphones to the Exstreamer headphone jack<sup>1</sup> / the Annunicom Line Out / Speaker connections
5. Connect the power to the Exstreamer: listen to the audio whilst the device boots up: it will announce its IP address: take a note of this, you may need it later during device configuration. A device can be locally configured via its inbuilt web server, or centrally using the Central Management System (CMS).
6. Once the device has announced its address, optionally, wait for the unit to contact the CMS and download its audio and confirm playback starts, then the headphones can be removed

### 2.3 Triggered Messaging Client

The simplest way to set up a triggered playback is to use the MOH Client firmware on a Barix Annunicom device, which has two digital inputs, an amplifier and can be PoE, e.g. For temporary exhibition information points.

The hardware installation is the same in principle as that for the Exstreamer: Connecting power and network: with the PoE capable Annunicom 200, this can be one connection!

1. connect the device to the local network

---

<sup>1</sup> If the Barix Discovery tool is used by the installer, there is no need to listen for the IP address: it can be discovered at any time.

2. connect the trigger device (switch, button, motion sensor...) to the input 0 of the Annunicom
3. connect the Line Out / Speaker output of the Annunicom to your Information booth equipment: how you do this depends upon your equipment design.
4. Insert a blank, formatted USB stick: FAT 16/32
5. Connect the power to the Annunicom: listen to the audio whilst the device boots up: it will announce its IP address: take a note of this, you will need it later during the device configuration.

Once the hardware has been connected, it needs to be configured and defined on the central application CMS.

## 3 Application configuration

The MOH Client application is preloaded onto Barix devices by the distributor when the User has ordered devices for use in a MOH configuration. For normal MOH use, there is no need for the user to make any configuration changes from the application defaults. The application uses local DHCP and DNS services to obtain the necessary information regarding internet access to the host CMS.

In the case where a client site does not have a DHCP or DNS server, the Client expert UI can be used to configure the necessary network settings.

### 3.1 Default CMS

On startup, the device will contact the configured MOH Central Server. For new devices this will be the hosted service operated by MOH Technology. MSPs who are setting up their own hosted system have two options:

- they can either update the device's Phone Home configuration directly themselves using the web UI of the device, or
- They can keep an account on the MOH system purely to commission new devices: new devices are defined with a Phone Home Path pointing to the MSP's own instance of the MOH server, or
- they can advise MOH Technology of the MAC address(es) of their units and the desired 'Phone Home Path' (PHP): MOH can then set the units to update their PHP automatically when they call in. To do this the device is set up on the MOH Hosted system and given a new PHP, which is passed to the device the first time it makes contact.

### 3.2 Client web UI - basic

All aspects of the application behaviour can be modified via the client device's web user interface, for this reason, the first view is read only: use this basic view if it is necessary to talk a client through troubleshooting a client device hidden behind a corporate firewall, for instance.

Enter the IP address announced by the device when it started up into the URL window of any standard browser, you will see the homepage of the device:

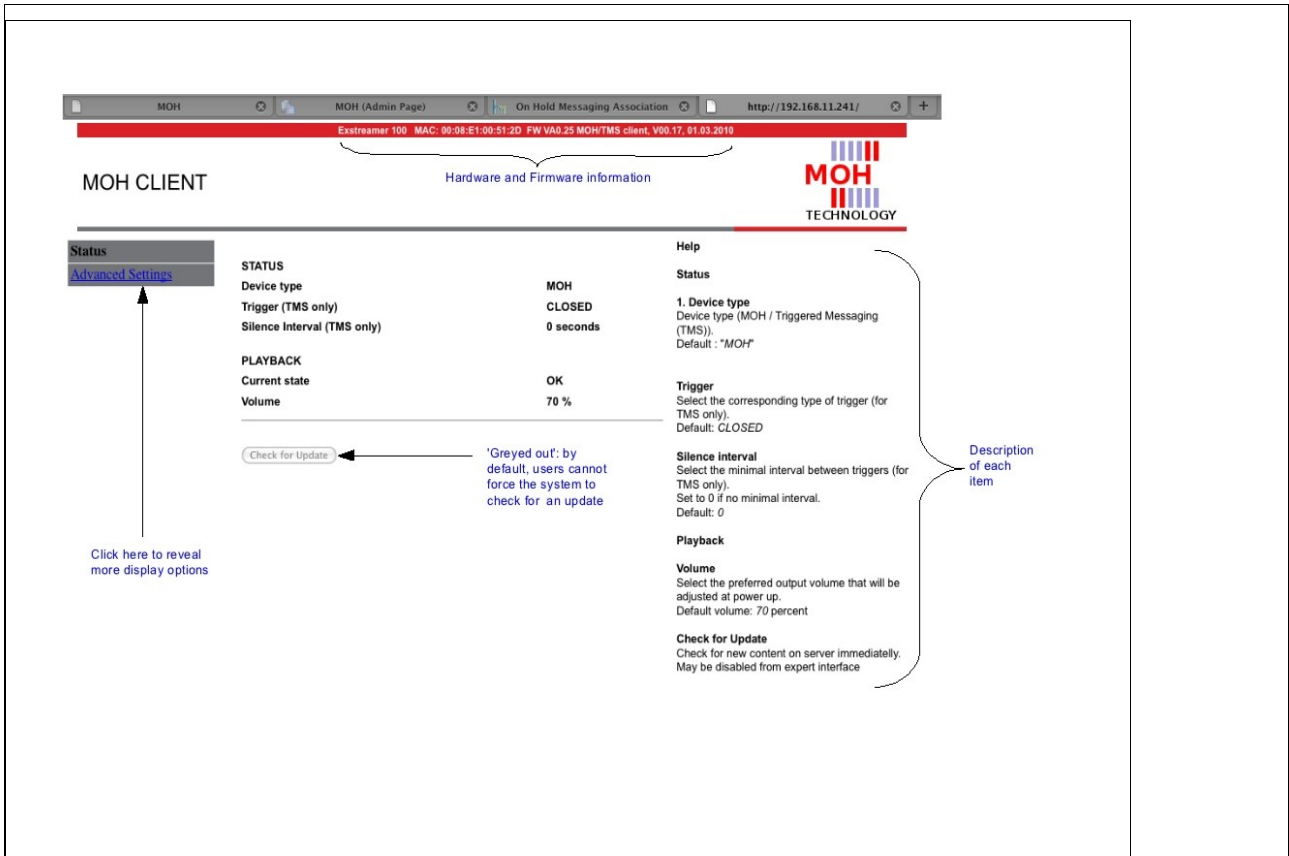


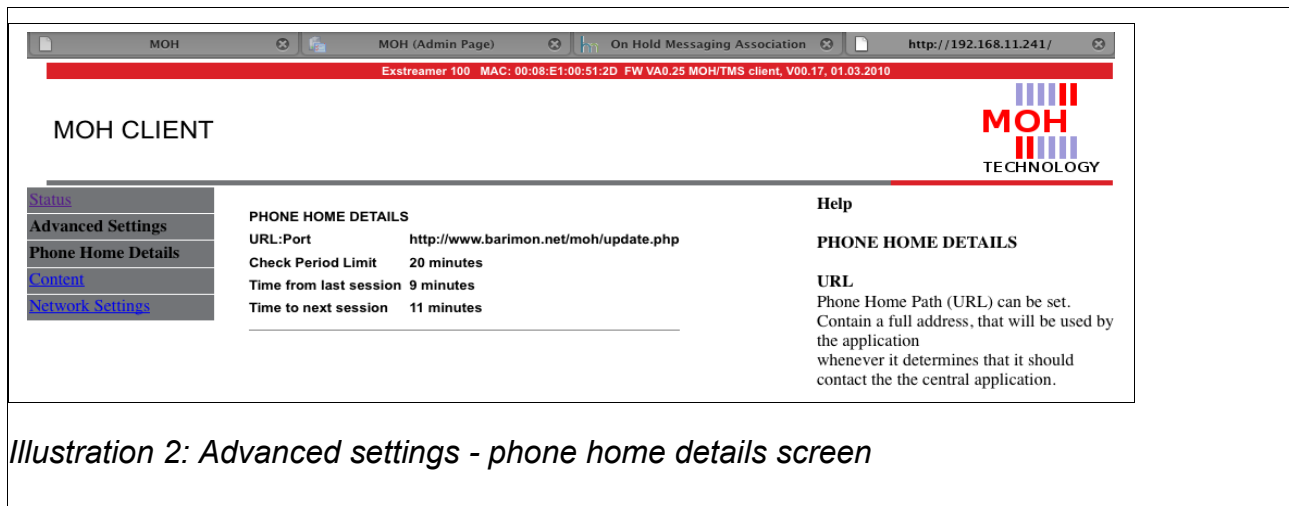
Illustration 1: MOH Client home page

A quick glance will show the key configuration information e.g. device status – 'OK' in the example.

Status	Meaning
OK	System operating normally
No server response	The client has had a problem contacting the server (cleared, now that this is being reported in the CMS!)
Update pending	The client has acknowledged that it must download new content
Audio Disabled	Audio is not playing at the Client location: Either because of suspended status, or because the client had been out of touch with the CMS for longer than the configured 'On error connection' period.
No content	The device storage has no content, hence no audio on site
No storage	Either there is no USB stick / Micro SD card inserted, or it is faulty. No audio at client location.

If the 'Check for Update' button is active, clicking on the button will force the client to try to contact the central server (CMS). This button is enabled/disabled from the expert UI described later in this document.

If it is necessary to find out more, click on 'Advanced Settings', the device will display the current 'phone home' settings and status (those settings that control where the device looks for updates and how often) and offer two further information pages.



*Illustration 2: Advanced settings - phone home details screen*

- The phone home URL is the URL that the device will use for communication with the central server – it uses this path when it looks for content updates and when it reports its status to the CMS.
- The check period defines how long the device should wait between communications sessions, the unit is minutes.
- Time from last session – how long since the Client last contacted the CMS
- Time to next session – how long until the Client next contacts the CMS to check for updates

Clicking on the 'Content' link shows the filenames and sizes of the main content and backup files.

Depending upon how the Customer is set up on the CMS, these filenames can vary:

- If the flag 'Send filenames to remote devices' is set to 'no' (the default option), on the client these files are always shown as 'content' and 'backup', irrespective of what they were called on the CMS.
- If the flag 'Send filenames to remote devices' is set to 'yes', then the CMS filename is sent down with a prefix 'C\_' or 'B\_' to represent a content or backup file respectively.

In the illustration below the content file scheduled on the CMS was 'Mix\_44.1khz but different.mp3'

Exstreamer 100 MAC: 00:08:E1:00:51:05 FW VB0.35 MOH/TMS client, V00.32.2K, 04.04.2011

# MOH CLIENT

- Status
- Advanced Settings
- Phone Home Details
- Content
- Network Settings

CONTENT	
Content file	C_Mix_44.1khz but different.mp3
Content file length	238236 bytes
Backup file	B_Mix_44.1khz but different.mp3
Backup file length	334785 bytes

### Help

**CONTENT**

**Content file**  
Name of the content file.

**Content file length**  
Length of the content file in bytes.

**Backup file**  
Name of the backup file.

**Backup file length**  
Length of the backup file in bytes.

*Illustration 3: Advanced settings: content*

Clicking on 'Network settings' reveals the currently configured values for the device.

## MOH CLIENT



Status	NETWORK SETTING	Help
Advanced Settings	Use SonicIP®	Yes
Phone Home Details	IP Address	0.0.0.0
Content	Netmask	0.0.0.0
Network Settings	Gateway IP Address	0.0.0.0
	Primary DNS	0.0.0.0
	Alternative DNS	0.0.0.0
	DHCP Host Name	
	Web Server Port	80
	Proxy server/password	

## NETWORK SETTINGS

## 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 device IP address e.g.:  
"0.0.0.0" for automatic discovery (DHCP/Bootp, IPzator, AutoIP)  
"192.168.0.12" for an internal LAN  
Default: "0.0.0.0"

Illustration 4: Advanced settings - network settings screen

Note: the example shown contains the default values of 0s – in this configuration the Client will look to use DHCP to determine automatically all of the necessary settings. In most installations there is no need to change any of the network settings.

The exception to this is the 'use SonicIP' setting. With this option set to yes, the device will automatically announce its IP address every time it starts – useful when configuring a unit, unnecessary at other times.

Some installations require all internet access via a proxy: this is supported: the details must be entered via the Network Settings tab of the /Expert part of the web interface.

### 3.3 Client web UI – advanced

In order to be able to change any of the settings on the client device via its web UI, it is necessary to use the 'expert' pages, these are reached by entering the <IP address>/expert into the URL window of any standard browser.

This separation is not intended as a security feature, it is simply to enable support staff to talk an onsite user, without any danger of the user inadvertently updating any settings!

Any changes made must be confirmed to the device by pressing on the 'apply' button, relevant changes will be passed to the CMS on the next call home.

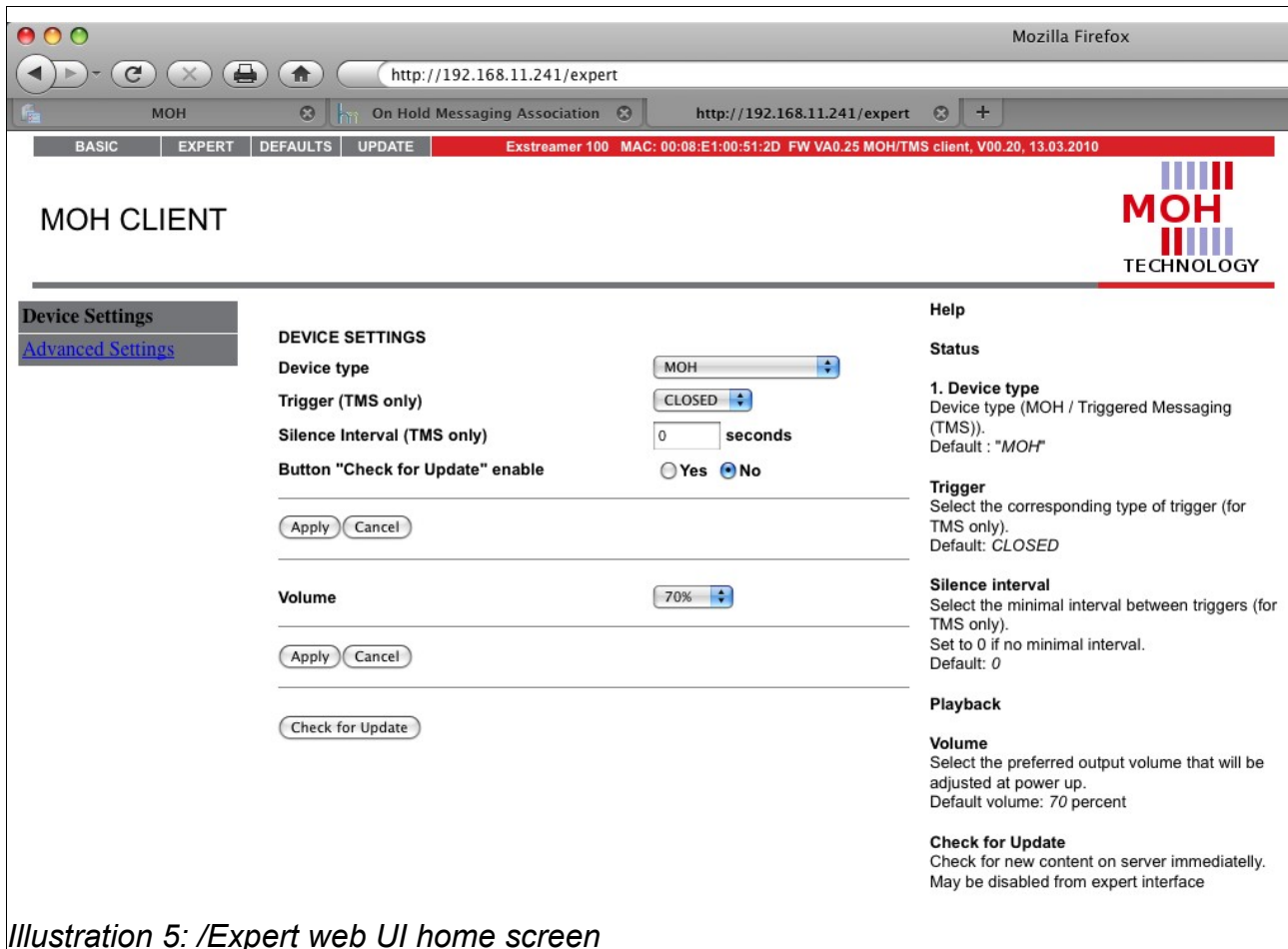


Illustration 5: /Expert web UI home screen

The expert pages offer four extra buttons in the top bar:



- **Basic:** navigate to basic home page
- **Expert:** navigate to Expert home page
- **Defaults:** restore Factory Default settings for the application: this feature must be enabled (see Network Settings description)
- **Update:** Allows the user to update the firmware using the standard Barix firmware update mechanism: this feature must be enabled (see Network Settings description)

Field	Description
Device type	Controls the behaviour of the device: <ul style="list-style-type: none"> <li>• MOH – the device will continuously play the audio file to the audio outputs, and to the network address, if configured</li> <li>• TMS – the device operates as a Triggered Messaging System: on hardware with an input, the device monitors the input and, when it triggers, will play the audio file once.</li> </ul>
Trigger	The device can interpret a rising edge or falling edge as the trigger: <ul style="list-style-type: none"> <li>• CLOSED means a High – Low transition will cause a trigger (as the input is connected to Ground.)</li> <li>• OPENED means a Low-High transition causes a trigger.</li> </ul>
Silence interval	Only relevant if the Device Function is set to Triggered Messaging. Used to define how long the application should ignore the GPI following a trigger event. The Silence Block period starts after the end of the audio file playback. This is to prevent too frequent activation of playback. Default 0s i.e. Off.
Enable 'check for update'	Controls whether the Client can be forced to contact the central server using the 'check for update' button on the web UI
'Apply'	This first apply button relates to the settings above, clicking this will apply the changes and force a reboot of the device to activate the changes. This is necessary as the behaviour of the device is being altered.
Volume	A new volume can be selected for the unit.
'Apply'	This apply relates to the new volume selection only: it does not force a reboot as the volume can be dynamically adjusted.

### 3.3.1 Phone Home Details

click on 'Advanced Settings', the device will display the current 'phone home' settings and status (those settings that control where the device looks for updates and how often) and offer two further information pages.

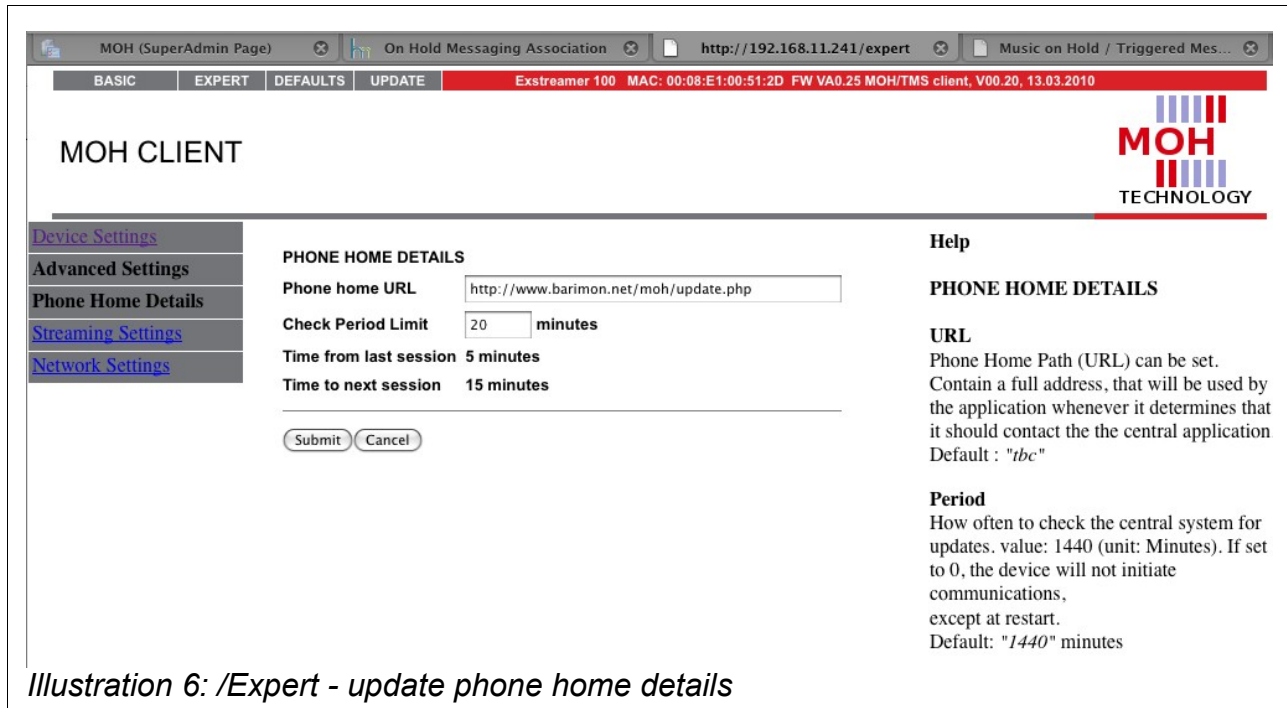


Illustration 6: /Expert - update phone home details

Field	Description
Phone Home URL	This is the URL the Client will use to look for the central CMS, for updates and status reporting. The default path is the MOH Technology hosted service. Service Providers who have set up their own instance of the CMS should have their own URL here. This can be set either by entering it here and pressing 'submit', or the field value will be updated if the CMS sends a new value down e.g. As part of the commissioning process, if the Service Provider gives MOH Technology all of the relevant information.
Check Period Limit	The time between phone home sessions, in minutes.

Any changes made must be confirmed to the device by pressing on the 'Submit' button, changes will be passed to the CMS on the next call home.

### 3.3.2 Streaming Settings

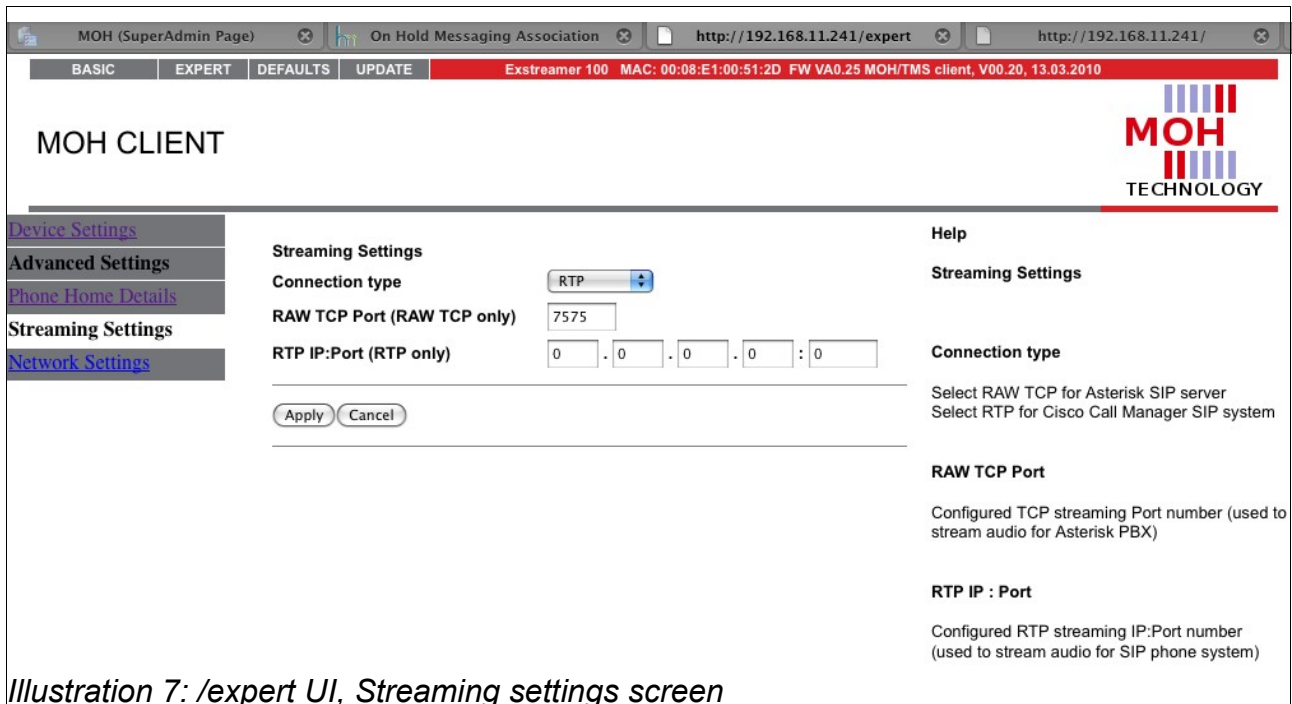


Illustration 7: /expert UI, Streaming settings screen

This screen is where the device is configured to stream its audio out onto the local network, which can be used to support SIP / VOIP systems and also as a Pre-recorded message announcer in an IP PA system (for example a calm evacuation announcement).

Different systems accept audio in different ways:

- Cisco Call Manager requires RTP in specific formats, to specific ports<sup>2</sup> and the MOH audio source must be correctly defined and configured
- Asterisk requests audio using Raw TCP when configured with the Streamplayer application: the MOH source listens for requests on a configured TCP 'Listen Port'

Any changes made must be confirmed to the device by pressing on the 'Submit' button, changes will be passed to the CMS on the next call home.

Field	Description
Connection type	RTP or Raw TCP, depending on what your system supports. Default: RTP
Raw TCP port	This is the TCP 'Listen Port' e.g. For Asterisk SIP server. Default 7575 (as this is currently unassigned by other applications)
RTP IP:Port	For RTP type connections, define the address that the audio should be sent to, including the port number. Default 0.0.0.0 If connection type = RTP and RTP IP:Port = 0.0.0.0:0, Network streaming is configured OFF.

<sup>2</sup>[http://www.cisco.com/en/US/docs/voice\\_ip\\_comm/custrst/admin/sccp\\_sip\\_srst/configuration/guide/srst\\_appendix\\_b.html#wp1011382](http://www.cisco.com/en/US/docs/voice_ip_comm/custrst/admin/sccp_sip_srst/configuration/guide/srst_appendix_b.html#wp1011382) details show to configure Cisco with MOH

### 3.3.3 Network Settings

Click on Network Settings, the device will display:

**MOH CLIENT**

MAC: 00:08:E1:01:B4:94 FW V00.32 MOH/TMS client, V00.27, 25.11.2010

**MOH TECHNOLOGY**

**Network Settings**

**NETWORK SETTING**

Use SonicIP®  Yes  No

IP Address: 0 . 0 . 0 . 0

Netmask: 0 . 0 . 0 . 0

Gateway IP Address: 0 . 0 . 0 . 0

Primary DNS: 0 . 0 . 0 . 0

Alternative DNS: 0 . 0 . 0 . 0

DHCP Host Name:

Web Server Port: 80

Proxy server/password:

**SECURITY SETTINGS**

Reset Function:  Enabled  Disabled

Factory Defaults:  Enabled  Disabled

Update Function:  Enabled  Disabled

**Help**

**NETWORK SETTINGS**

**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 device IP address e.g.:  
"0.0.0.0" for automatic discovery (DHCP/Bootp, IPzator, AutoIP)  
"192.168.0.12" 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  
Default: "255.255.255.0"

**Gateway IP Address**  
Enter the 4 values of the desired Gateway IP address e.g.:  
"0.0.0.0" for no Gateway

*Illustration 8: /expert UI, Network settings screen*

#### Network Setting Area:

In a network with a functioning DHCP server, there is no need to update any of these settings, with the possible exception of the DHCP host name – which may be used to identify the device on the local network.

If no DHCP server is present on the network, the appropriate values must be entered here: this is for experts only, requiring intimate knowledge of the IT setup for the organisation. The device also supports gaining internet access via a proxy, with the ability to specify userid, password and port number to use.

#### Security Settings Area:

Field	Description
Reset function	Used to enable or disable the reset functionality on both the device Reset button AND the web UI. Default: Disabled, this is because this application uses the reset button to effect volume changes: each press increases the volume by 5% from the current value, cycling from 100% to 5% In normal operation this should be 'disabled'.

Factory Defaults	Whether the restore factory defaults function is enabled, or not: On reset button (10 second press) and web UI
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"

Any changes made must be confirmed to the device by pressing on the 'Submit' button, changes will be passed to the CMS on the next call home.

### **3.4 Standalone player**

Not all customer sites provide Internet access, in this case it is still possible to use the MOH Client firmware to provide on hold audio / Triggered Messaging.

With its default settings loaded, the Client will play a file called "content.mp3" if it is present on the attached storage (USB stick, or micro SD card, depending upon the Barix hardware being used).

To update the audio simply change the file on the storage. The file to play must always be called "content.mp3" for standard audio output.

Some operators prefer to use a more meaningful filename in standalone mode, as they email files to customers and it can be easy to mix up two files with the same name. The MOH system supports this too, but the filenames MUST have either "C\_" or "B\_" at the start of the filename to indicate whether the file is a Content, or Backup, file, e.g.

C\_Roland Garros\_010611.mp3

If the site later is connected to the internet, simply plug a network connection into the device – it will automatically<sup>3</sup> detect the network and attempt to contact the central CMS (where it will must be defined).

---

<sup>3</sup> From v0.27 of the hardware, or if IP address 0.0.8.0 is configured

## 4 Exchanging device configuration updates with central CMS

The MOH System supports the ability for changes to device configuration to be made either centrally using the CMS, or locally via the /expert web UI.

Clearly the configuration must be kept in step at both locations and to achieve this, the client devices and the CMS exchange update information when the client calls in to the centre at every phone home session.

Details of changes in the following parameters are exchanged, alongside any audio content updates:

- phone home path
- Device type
- connection type
- TCP port
- RTP IP:Port

## 5 Legal Information

© 2011 MOH Technology AG, Buchs, Switzerland.

All rights reserved.

All information is subject to change without notice.

All mentioned trademarks belong to their respective owners and are used for reference only.

For information about our solutions and the latest version of this manual please visit [www.moh-technology.com](http://www.moh-technology.com)

MOH Technology AG  
CH 9470 Buchs  
SWITZERLAND

[info@moh-technology.com](mailto:info@moh-technology.com)