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Algo 8180 Integration with Zultys

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This document describes the integration of Algo 8180 SIP Audio Alerter with the Zultys MX. Algo 8180 can be integrated as a “night bell”, a paging device or a page server used to relay a SIP-based page into a multicast page zone, or using the built-in audio out option. Multiple Algo units can be linked together to cover larger areas.

Algo 8180 can support 1 “ringing” user or DN and 1 “paging” user or DN, as well as a 9 (nine) multicast address. When Algo 8180 is utilized as a loud ringer/bell the “ringing user” is used and when paging Algo 8180 the “paging user” is used, as the paging user will auto answer. The ringing user can play up to 4 (four) unique alerting tones based on the “TO” information provided.

For night bell operation with multiple ring tones, firmware 2.0.3.1 is required.

Currently Algo 8180 can handle a single call at one time.

This document assumes the reader is familiar with creating users and assigning users to devices, as well as the basic configuration of the MX.

For full documentation of Algo 8180, refer to the User Guide provided by Algo.

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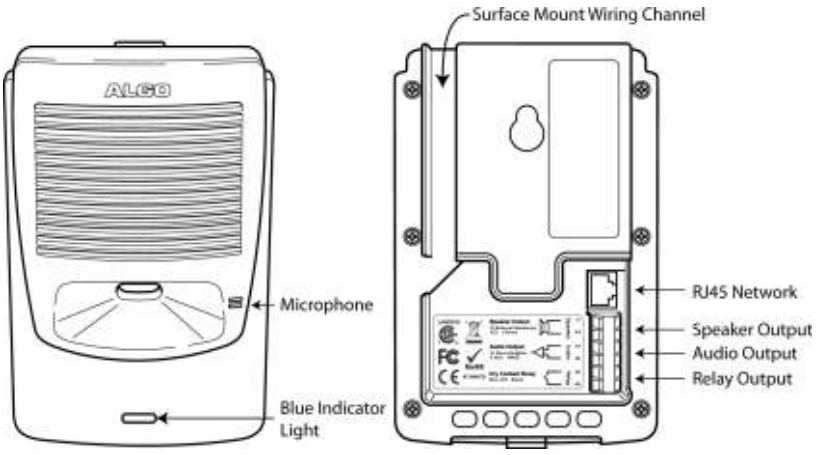
2 Algo 8180 Information

2.1 Device Settings and Specifications

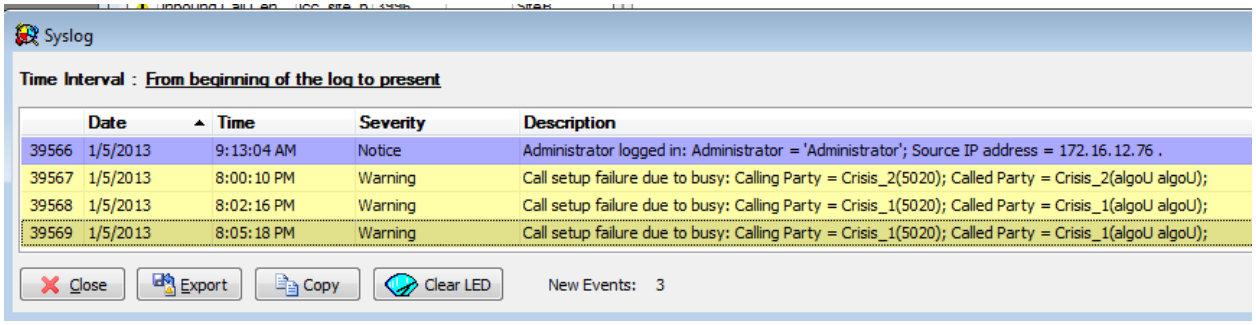


Power Input	48 V PoE Class 0 (Max 12.95 W - Idle 1 W)
Sound Pressure Level (dBA at 1 m)	106 dBA internal speaker 120 dBA external horn speaker
Internal Memory	3 MB • 6 minutes @ 8 kHz sampling 8-bit μ-Law audio • 90 seconds @ 16 kHz sampling 16 bit linear audio
Relay Output	Max 30 V 50 mA
Speaker Output	5.5 Wrms 8 Ohm (auto-detection disconnects internal speaker)
Audio Output	0 dBm into 600 Ohm load
Ring Tones (Shipping with 8180)	• Bell NA • Bell UK • Buzzer • Chime • Dogs • Gong • Warble1 (low) • Warble2 (medium) • Warble3 (high) • Warble4 (trill)
Environmental	0-40° C; 10-95% RH non-condensing; Indoor use only (horn speaker may be located outdoors)
NAT (Network Address Translation)	STUN, CRLF Keep Alive
Compliance	EN60950:2001, IEEE 802.3-2008, RFC3261, RoHS, CE, FCC, CSA (USA & Canada)

2.2 Algo 8180 Limitations

Algo 8180 can only support a single call at a time. When multiple calls are sent to Algo 8180, it will only accept the first call it receives. If the second call is still ringing, once the first call is answered, Algo 8180 will stop playing the ring tone for the first call, and then start ringing for the second call, playing the appropriate ring tone for that call.

In a "Ring All" call group, there might be a short delay between the invites sent to Algo 8180 because the first invite sent was rejected with a "486 busy here" message. This is normal operation. There will also be a Syslog Entry noting when this happens.



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3 Modes of Operation

Algo 8180 has 3 basic modes of operation: 1 mode for paging and 2 "Night Bell" modes. Both of these modes can be used at the same time alongside one of the page modes.

3.1 Page Modes of Operation

Only one page mode of operation can be configured at a time on Algo 8180, with both Night Bell modes.

3.1.1 SIP Page Mode

In SIP page mode, Algo 8180 is configured as a device in the MX's Page Zone that will be paged alongside other devices in that page zone. Algo 8180 will receive a SIP INVITE, accept and answer it automatically, then play the page over its built-in "loud speaker".

3.1.2 Multicast Page Mode

In Multicast page mode, Algo 8180 is configured as a device listening to the Multicast Page IP:Port combination that a ZIP3 or ZIP5 phone is broadcasting to. Algo 8180 will accept, and play the page over its built-in "loud speaker".

3.1.3 SIP and Multicast Page Mode

In SIP and Multicast page mode, Algo 8180 is configured as a device in the MX's Page Zone that will be included when a page is made to that page zone. Algo 8180 will receive a SIP INVITE, accept and answer it automatically, then play the page over its built-in "loud speaker". At the same time Algo 8180 will broadcast the SIP page as a multicast page to a multicast page IP:Port combination that ZIP5 and ZIP3 phones are listening to.

3.2 Night Bell Mode of Operation

Algo 8180 can support both Night Bell modes at the same time alongside a single Page mode.

3.2.1 Single/Default Ringtone

In the Single/Default Ring tone mode, there is no customization of the ring tone. A ring tone is selected, and will be used for all calls presented to Algo 8180.

Algo 8180 can only support 1 (one) call at a time.

3.2.2 Custom Ringtone Based on SIP "TO" INVITE

In Custom Ringtone based on SIP "TO" INVITE, Algo 8180 selects a particular ring tone based on the SIP TO information in the SIP INVITE. Algo 8180 can support up to 4 ringtone selections.

Algo 8180 can only support 1 (one) call at a time.

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4 Multicast Paging

4.1 How Multicast Paging Works

After a user presses a configured "Paging" key on the phone, the phone sends a page message (which is an RTP stream, hereinafter referred to as a "page") to a preconfigured multicast address. Any device in the local network listens for the page on the preconfigured multicast address. The device will display the multicast page sent/received address to the user. You can define multiple multicast zones by using a different multicast IP or port number, a single device can listen to multiple IP:Port combinations.

The device uses G711 uLaw CODEC for multicast paging.

The recipient can drop the incoming page if required. The recipient can also press Do Not Disturb (DND) or other "ignore" options on the device to ignore/reject any incoming pages.

4.2 Caveats of Multicast Paging

Multicast paging is designed for ZIP5/ZIP3 phones only. There is no guaranteed interoperability with any other Zultys-supported phones. Algo 8180 is an exception, as it has been tested and certified to work properly with the ZIP5/ZIP3 phones. The ZIP2xN phones and MXIE Softphone do not support multicast paging. The 57iCT cordless handset cannot initiate a multicast page.

This service is non-routable, and cannot be used to page across the MXnetwork or to remote devices.

Note: The Group Paging Settings are dependent on the setting for the "Allow Barge In" parameter.

Note: Multicast page is one-way only - from sender to the receiver.

Note: For outgoing pages, all other existing calls on the phone are put on hold.

For incoming pages, the ringing display is dependent on the "Allow Barge In" parameter. If this parameter is disabled, and there is no other call on the phone, then the paging is automatically played via the preferred audio device.

If there is an existing call on the phone, the call initially displays in the ringing state. The user has the option to accept/ignore the call. If the "Allow Barge In" parameter is enabled, the page call barges in, and any existing calls are put on hold.

If a page session already exists on the phone, and the phone receives another incoming page, the priority is given to the first multicast session and the second multicast session is ignored. The behavior for the incoming calls in this case is also

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based on the setting for the "Allow Barge In" parameter. The incoming call is handled as if there were an existing call already on the phone.

4.3 Advantages of Multicast Paging

Multicast paging allows for virtually unlimited paging capability in a local network, does not require a session license to operate, and is almost instantaneous, as it does not require the phones to acknowledge the page request.

5 SIP Paging

5.1 How SIP Paging Works

SIP paging works as follows: the MX places a call to the device with an auto answer flag if the device is a ZIP5, ZIP3 or a Polycom device (other device types must be specifically configured to answer pages automatically), once all devices have answered the call, the page is made to these devices.

5.2 Caveats of SIP Paging

- SIP paging is limited to 32 devices on a MX250 and 16 devices on an MX30.
- Session License is required.
- SBC Licenses are required if SIP paging is used with Remote phone(s).

5.3 Advantages of SIP Paging

- Works with remote devices.
- Works with the entire ZIP product line with no exceptions.
- Works with Polycom devices.
- Works with MXIE Softphone.

6 Configuring Ringing Device on the MX for Algo 8180

Algo 8180 interfaces with the MX system through a preconfigured MX user. A single user / device will interface with the MX for ringing purposes. To initiate Algo 8180's loud ringer/bell function, place a call to this user / device combination and it will "ring" until the call is answered.

6.1 Create Generic SIP Profile

Create a generic SIP device profile to control the codecs and number of lines used by Algo 8180.

Make sure that the following options are selected.

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Sends SIP Register: Checked.

Supports SIP based configuration: Checked.

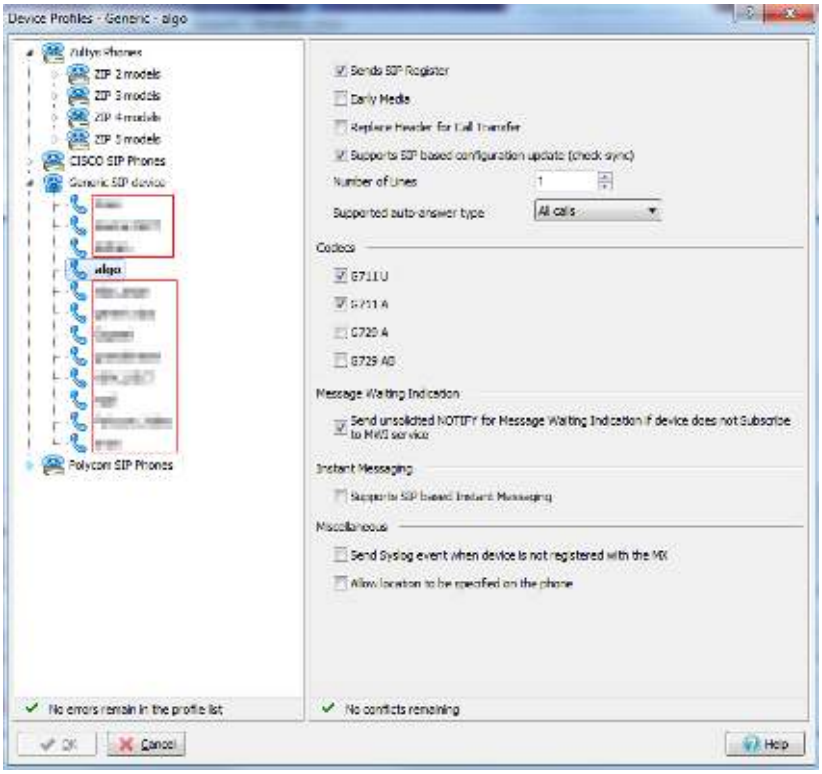
Number of Lines: 1.

Supported auto-answer type: All Calls.

Codecs: G711U and G711A.

Send unsolicited NOTIFY for messages: Checked.

The remaining options are unchecked.



6.2 Create Generic SIP Device

Create a generic SIP device on the MX for the MX to integrate with Algo 8180.

Make sure that the following options are selected.

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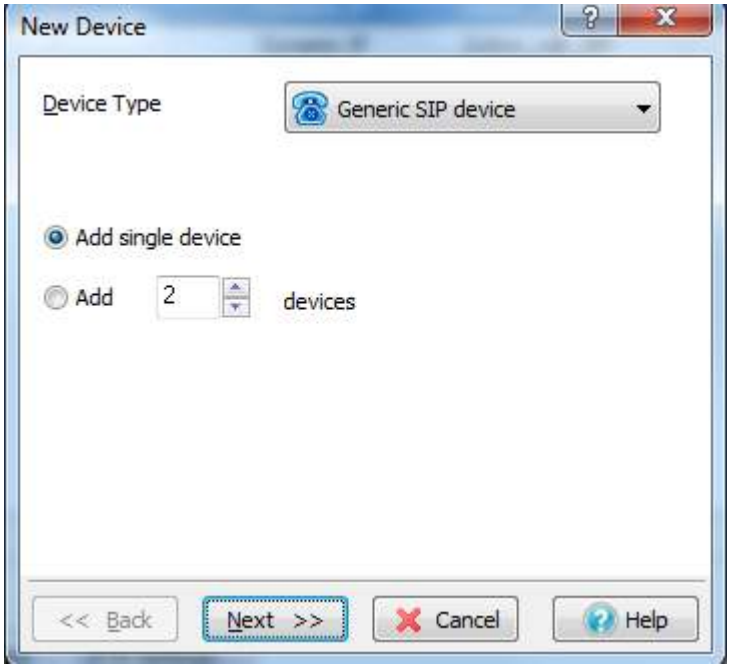
Device Type: Generic SIP device.

Add Single Device: Selected.

Click *Next* to proceed to the next screen.



Profile: Select the Generic SIP Device Profile created in section 6.1.

Default Location: Select the proper location from the drop-down.

Device ID: Type the ID to register Algo 8180 Ringing extension.

Contact: Not used.

SIP Proxy Password: Type the password if required.

6.3 Create User and Assign User to the Device

After creating the device that will interface with Algo 8180, create a user and assign the user to this device. This document assumes the reader is a ZCSE trained and a certified technician. Since this process is covered by ZCSE training, it is considered to be outside the scope of this document.

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7 Configuring Paging Device on the MX for Algo 8180

Algo 8180 interfaces with the MX system through a preconfigured MX user. A single user / device will interface with the MX for paging purposes. To initiate a paging message over Algo 8180, place a call to this user / device combination to start the paging process.

7.1 Create Generic SIP Profile

Create a generic SIP device profile to control the codecs and number of lines used by Algo 8180.

Make sure that the following options are selected.

Sends SIP Register: Checked.

Supports SIP based configuration: Checked.

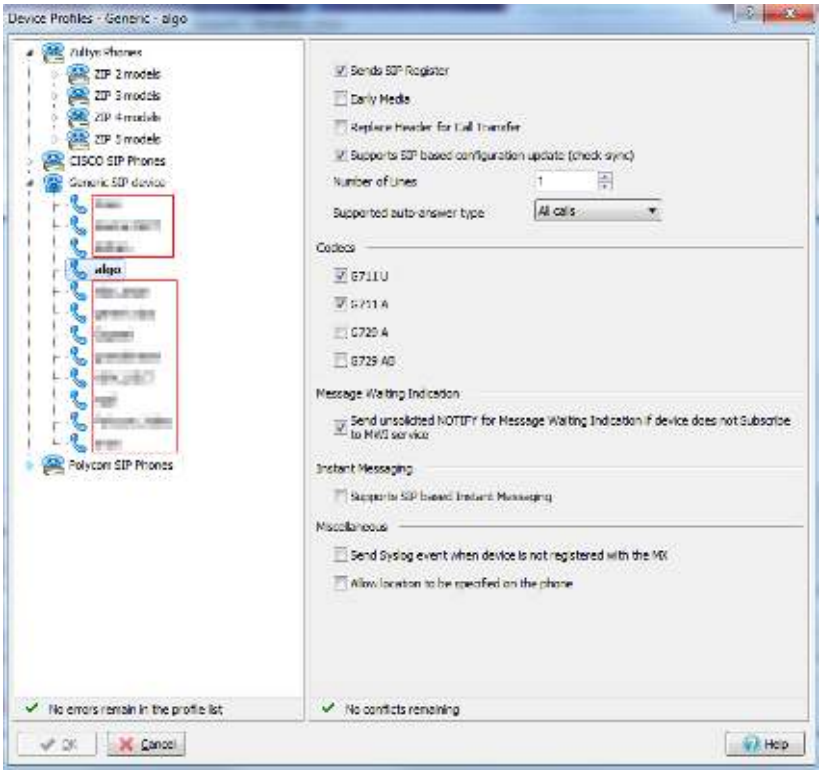
Number of Lines: 1.

Supported auto-answer type: All Calls.

Codecs: G711U and G711A.

Send unsolicited NOTIFY for messages: Checked.

The remaining options are unchecked.



7.2 Create Generic SIP Device

Create a generic SIP device on the MX for the MX to integrate with Algo 8180.

Make sure that the following options are selected.

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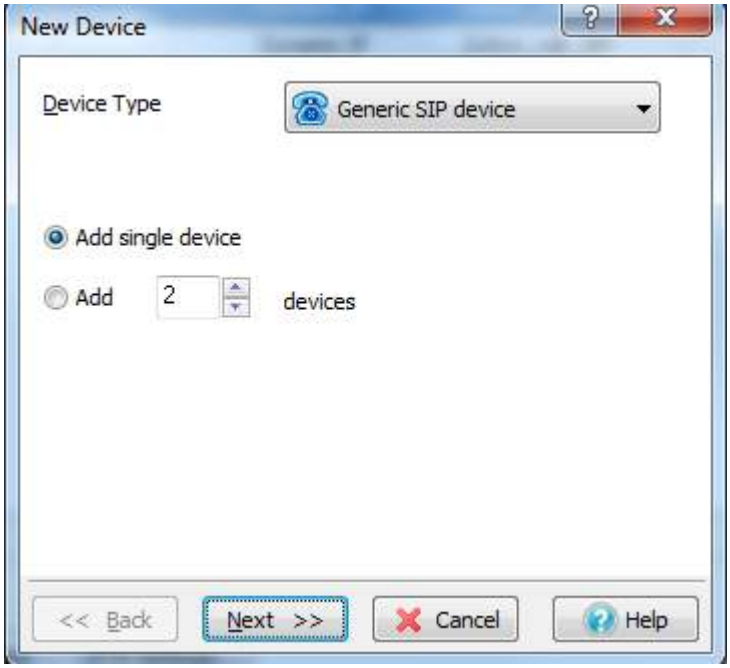
Device Type: Generic SIP device.

Add Single Device: Selected.

Click *Next* to proceed to the next screen.



Profile: Select the Generic SIP Device Profile created in section 7.1.

Default Location: Select the proper location from the drop-down.

Device ID: Type the ID to register Algo Paging extension. **Contact**: Not used.

SIP Proxy Password: Type the password if required.

7.3 Create User and Assign User to the Device

After creating the device that will interface with Algo 8180, create a user and assign the user to this device. This document assumes the reader is a ZCSE trained and a certified technician. Since this process is covered by ZCSE training, it is

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considered to be outside the scope of this document. Note that you need to create and assign a paging profile to the user if they will be using SIP paging.

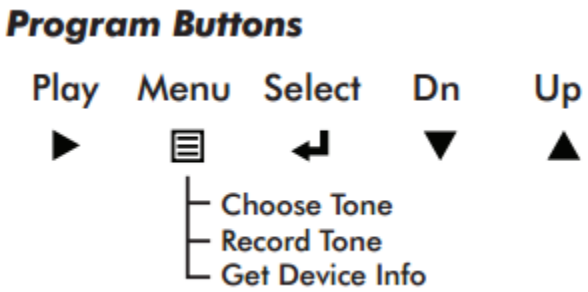
8 Programming and Configuration

Primary configuration of the 8180 is done through the web interface control panel. In addition, there are program buttons on the unit itself for basic setup options.

Connect Algo 8180 to a network PoE port. The blue indicator light turns on during initialization. Algo 8180 then attempts to obtain an IP address from the DHCP server. If unsuccessful, the 8180 defaults to the fixed IP address of 192.168.1.111. When the IP address is selected, Algo 8180 chimes and the blue light turns off.

8.1 Obtaining current IP address of Algo 8180

Algo 8180 is configured using a web interface tool accessed by entering Algo 8180's IP address into a browser. To find this IP address, press the *Menu* button until the option for "IP Address" is reached. Then press *Select* to hear the address. Alternatively, search the network using the Algo Network Device Locator Tool available for download from www.algosolutions.com/locator.



The Program buttons on the back of Algo 8180 allow local adjustment of alert tones and alert volume. The buttons are intentionally hidden from view after installation and can be disabled using the web interface. The ▶ button plays the current ring tone and allows volume adjustment using the ▼ and ▲ buttons. Press ▶ to exit. The ☰ button cycles through the following options:

- Choose ring tone
- Record ring tone using microphone
- Get device information (IP address and MAC address)

Press the ↵ button to choose an option or ▶ to exit.

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8.2 Web Interface

After identifying the IP address associated with Algo 8180, type it into any web browser to access the web interface of the device. The default password is "algo".

8.3 Network Setup of Algo 8180

In most cases, it is not necessary to assign a static IP to Algo 8180 because it is register with the MX, so the MX is aware of Algo 8180's IP address at all times.

Below is an explanation of available settings.

DHCP: Dynamic Host Configuration Protocol (DHCP) is an IP standard designed to make administration of IP addresses simpler. Normally set to On, DHCP will automatically configure IP addresses for each Algo 8180 on the network. Alternatively, if your IT administrator has assigned one or more static IP addresses, set the DHCP setting to Off.

VLAN Support: Enables or Disables VLAN Tagging.

VLAN ID: Specifies the VLAN to which the Ethernet frame belongs.

VLAN: Sets the frame priority level.

DHCP Timeout: Length of time following a request from Algo 8180 to the DHCP server that the device will wait before assuming the server is not available. After the timeout, the device will use its default address of

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192.168.1.111

The default value is 60 seconds.

NTP Server: Network Time Protocol server's IP address. Allows the device to automatically set its clock by connecting to an external server.

8.4 Administration of Algo 8180

Below is an explanation of available settings.

Example Admin screen with Provisioning enabled

Device Name: Name to identify the device in the Algo Network Device Locator Tool.

Password: Password to log into Algo 8180 web interface. You should change the default password in order to secure the device on the network.*

Program Buttons: Enable or disable the Program Buttons on the back of Algo 8180.

Log Level: Amount of information provided in the log files.

Language: Set Web Interface language (More languages will be added in the future. Please contact Algo with your request.)

Voice Prompt: Set Voice

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Prompt language (More languages will be added in the future. Please contact Algo with your request.)

* If you have forgotten your password, a soft reset will restore the device to its default setting including the password. To do this, disconnect the network cable from Algo 8180. Push and hold the Volume Down button and reconnect the network cable. Hold the button until the front light flashes three times.

9 Configuring the Ringing User on Algo 8180

The "ringing" user on Algo 8180 is used when Algo 8180 is deployed as a ringing device, and will continue to ring until the call is answered. To configure the user for the "ringing" user, navigate to the *Config* -> *SIP* section of the web interface for Algo 8180.

- Make sure that the following options are selected.**SIP Domain/Proxy**: IP or FQDN of the MX.
- **Outbound Proxy**: IP or FQDN of the MX.
- **STUN Server**: Not used, leave blank.
- **Register Server**: IP or FQDN of the MX.
- **Register Period**: 3600.
- **Different Ports for Extensions**: Off.
- **Keep-alive Method**: None.
- **Ring Detect Extension**: Device ID of the ringing user in the MX.
- **Auth ID**: Device ID of the ringing user in the MX.
- **Password**: SIP Proxy Password of the device if you are using a password on the MX.

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10 Configuring the Paging User on Algo 8180

The "paging" user on Algo 8180 is used when Algo 8180 is deployed as a paging device, and will automatically answer the call on the first ring. To configure the user for the "paging" user navigate to the *Config* -> *SIP* section of the web interface for Algo 8180.

Make sure that the following options are selected.

- **SIP Domain/Proxy**: IP or FQDN of the MX.
- **Outbound Proxy**: IP or FQDN of the MX.
- **STUN Server**: Not used, leave blank.
- **Register Server**: IP or FQDN of the MX.
- **Register Period**: 3600.
- **Different Ports for Extensions**: Off.
- **Keep-alive Method**: None.
- **Page Audio Extension**: Device ID of the paging user in the MX.
- **Auth ID**: Device ID of the ringing user in the MX.
- **Password**: SIP Proxy Password of the device if you are using a password on the MX.

11 Paging with Algo 8180

Algo 8180 can be used as a standard standalone page zone incorporated into the MX page zone(s) or as a SIP page to Multicast Page converter to extend the paging capability of an MX.

11.1 Standalone SIP Page Server

When using Algo 8180 as a standalone page zone, you would call the extension associated with the "Page" user, and a SIP call will be placed to Algo 8180 and it is responsible for delivering the page.

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11.2 SIP Page using the MX Page Server/Zones

When using Algo 8180 in the MX page zone, create a Page Zone and Paging Profile as you normally would, and then add Algo 8180 "Paging" user into the same page zone. When the Page zone is accessed, Algo 8180 will also be included when the MX places a SIP call to Algo 8180 unit and it will auto answer the call alongside all the other devices in the zone.

11.3 Multicast Page from ZIP5xi or ZIP3xi Devices

When integrating Algo 8180 into a Multicast Page Zone from either a ZIP3xi or a ZIP5xi phone, Algo 8180 needs to be in "Slave" mode as the ZIP3/ZIP5 phone will be the "Master". Navigate to Algo 8180's configuration page, click on the *Config* option, and under the features header, check "All Call" as a Multicast Slave Zone so that the device will "listen" to the Multicast IP:Port defined in the Advanced Multicast Settings.

Setup the ZIP5/ZIP3 as you normally would for Multicast paging to "broadcast" at the same IP:Port Algo 8180 is listening to, for further information see ZIP5xi and ZIP3xi multicast instructions in section 16 and section 17.

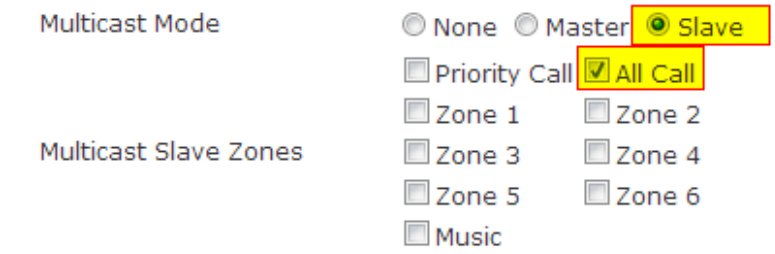
Make sure that the following options are selected.

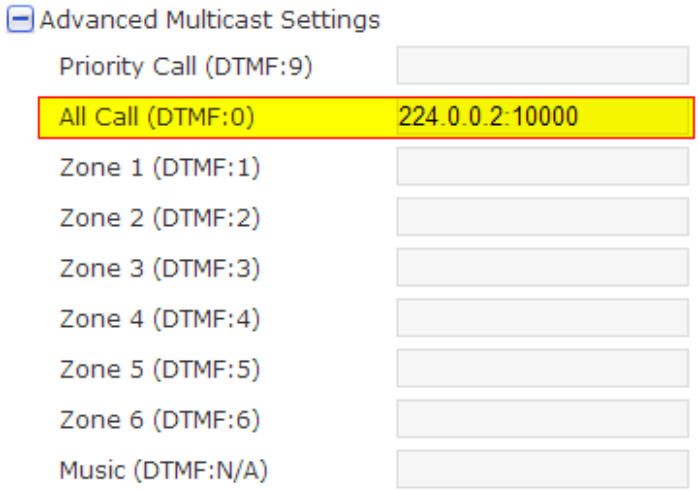
Multicast Mode: Select "Slave" as Algo 8180 will listen to the Multicast page stream being sent from the ZIP5 and ZIP3 devices.

Multicast Slave Zone: All Call.

All Call (DTMF:0) : The Multicast IP:Port should be the same as the ZIP5/ZIP3 devices are broadcasting to.

For the remaining items, leave the sections at the default settings or "blank".





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11.4 SIP and Multicast Paging

In SIP and Multicast mode, Algo 8180 is a member of the MX Page Zone, so a SIP call is placed to Algo 8180 "paging" user and when the device answers the call, it immediately starts streaming the SIP page into a Multicast page zone.

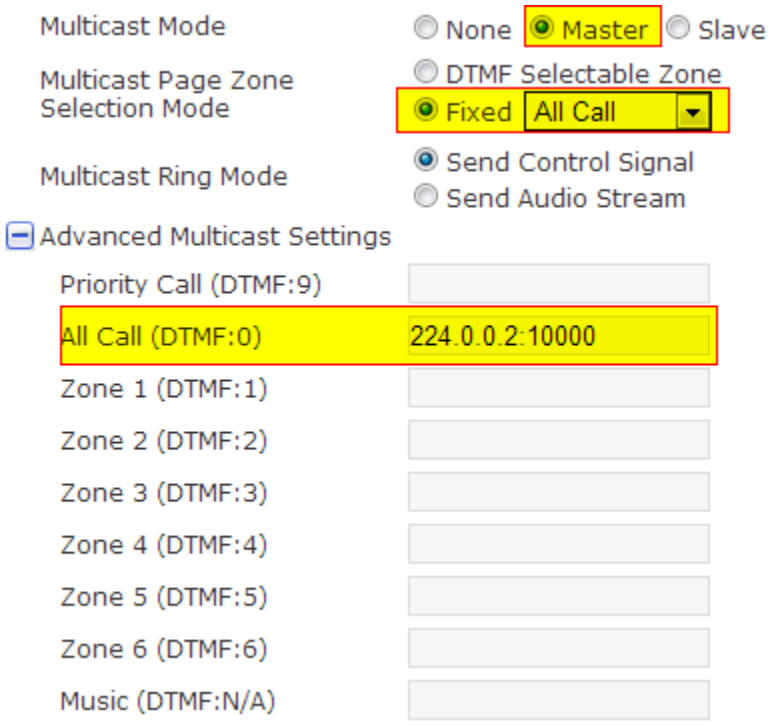
Make sure that the following options are selected.

Multicast Mode: Select "Master" as Algo 8180 will create the Multicast page stream to be sent to the ZIP5 and ZP3 devices listening to the Multicast IP:Port.

Multicast Page Zone Selection Mode: Fixed and select "All Call" from the drop-down.

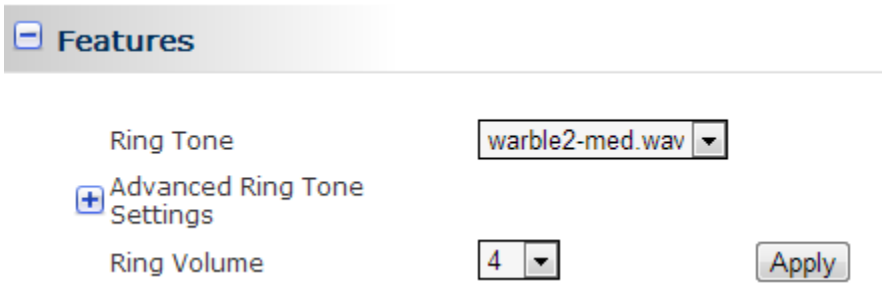
All Call (DTMF:0) : Enter the Multicast IP:Port the ZIP5/ZIP3 devices are listening to.

For the remaining items, leave the sections at the default settings or "blank".



12 Night Bell (Single Ring Tone)

The Night bell operation of Algo 8180 is triggered by calling the "Ringing" user extension which will call Algo 8180. Select the Ring Tone from the drop-down and set the ring volume (the default setting of 4 is good for most environments). In this mode, all calls sent to Algo 8180 use the same ring tone.



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13 Night Bell with Multiple Tones

Algo 8180 can be configured so that a different ring tone is played over the loud speaker depending on the "TO" header information of the incoming call. This option requires Algo firmware 2.0.3.1 which can be obtained from Zultys or Algo directly. This firmware was custom developed by Algo for Zultys.

The Custom ring tone is based off of the "TO" header of the SIP INVITE and a Custom Ring Tone rule, this offers great flexibility for using a single MX User as a member of multiple groups where Algo 8180 selects which ring tone to use based off the call group name.

Currently there is a maximum of 4 custom ring tones plus the "default" ring tone. Only 1 (one) call can be processed at a time.

13.1 Create a User, Device and Assign Device to User

13.2 After creating the device that will interface with Algo 8180, create a user and assign the user to this device. This document assumes the reader is a ZCSE trained and a certified technician. Since this process is covered by ZCSE training, it is considered to be outside the scope of this document. Add User to the Call Group

Add Algo 8180's "Ringing" user to a call group, in this example we will use a Hunt Group as it does not require login. If ICC/ACD/Operator groups are required, log the user in utilizing DTMF Controls. To add the user to the call group, in the MX Administration navigate to *Configure -> Operator and Call Groups,* and select the group you wish to add the user to, find the user and add by clicking the "*add*" arrow, then click *Apply*.

Note that the call group name cannot have spaces in it.

In the image below the user is "algoU" and the call group is "Crisis_1".

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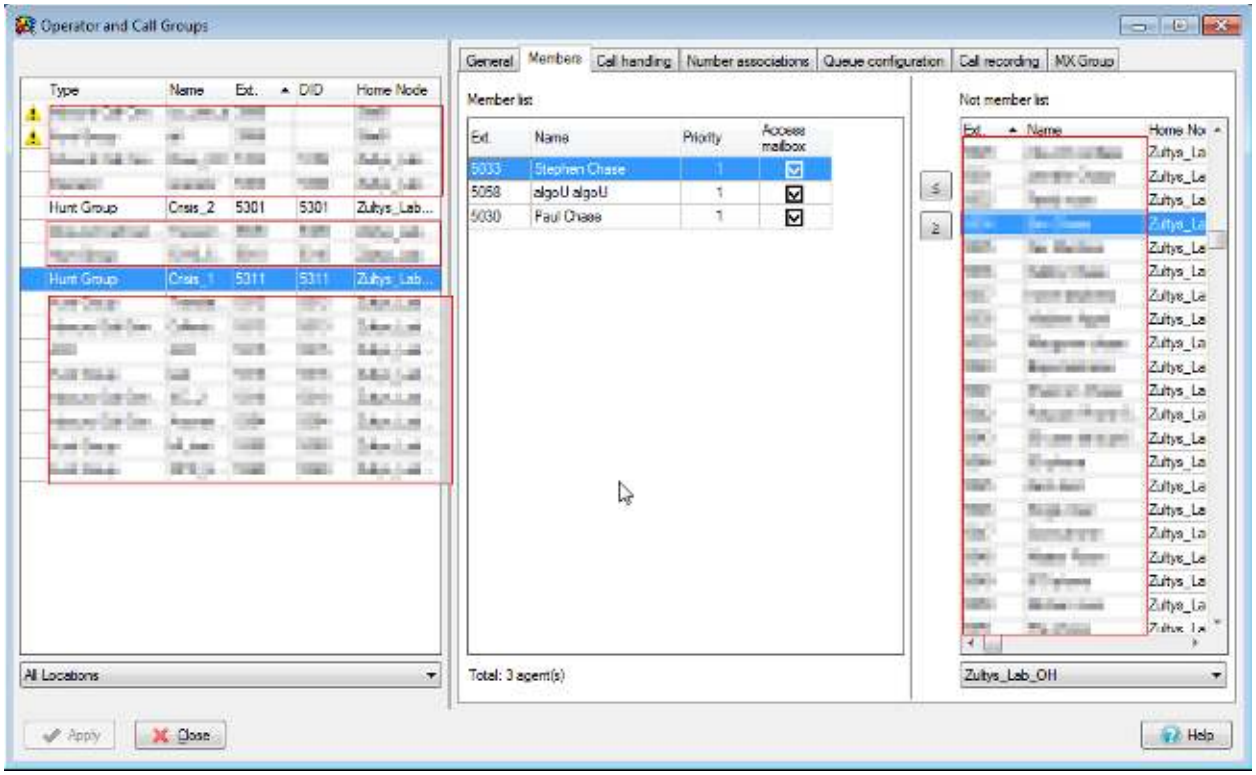

13.3 Algo 8180 Configuration

It is assumed the algoU user is properly set up and configured, as shown in section 7. In Algo 8180 web interface navigate to *Config* -> *Features*, and expand the "*Advanced Ring Tone Settings*".

Make sure that the following options are selected.

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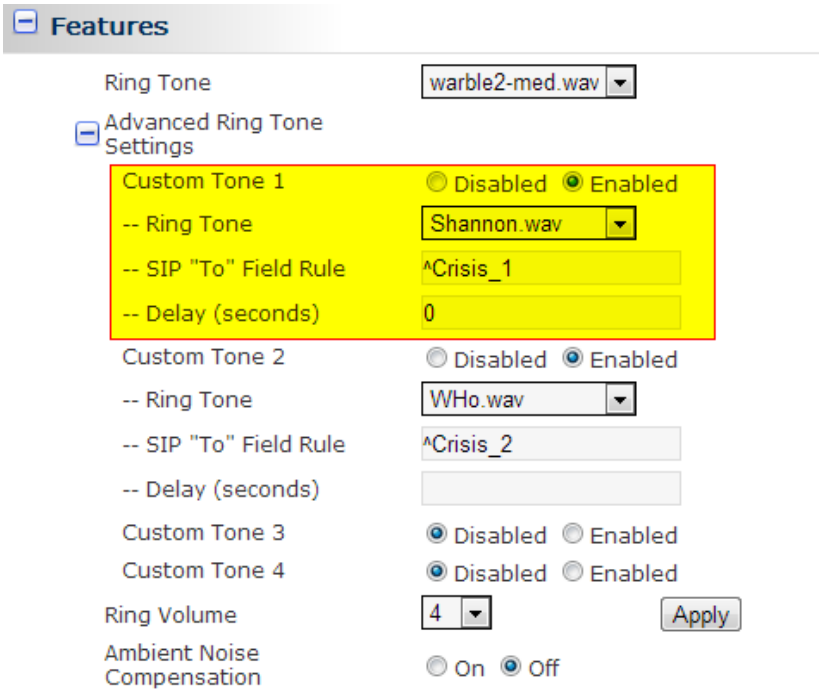
1. Enable the first custom ring tone.
2. Select appropriate ring tone from the drop-down list.
3. In the SIP "TO" Field Rule type the name of the call group associated with the ring tone.

Optionally, set the Delay (seconds) field.



13.3.1 Definition of "Rule" field

The Rule field uses the POSIX Extended "Regular Expression" format to allow maximum flexibility.

- "^" means that the text must be at the beginning of the Caller ID string. So "^Group1" matches all strings that start with the text "Group1". For example: "Group1 555-123-4567".
- "$" means that the text must be at the end of the Caller ID string. So "123$" matches all strings that end with 123", for example "Steve 123".
- For an exact match, use both of the above. Thus "^Steve$" matches only the string "Steve".
- If neither "^" or "$" are used, then the string matches the text anywhere in the string. So a Rule of just "Steve" matches both "123 Steve" and "Steve 123".
- For a default case, use ".*" which matches everything (any number of any characters), including blank.
- A blank Rule string does not match anything, leaving a blank Rule string will disable the setting.

Once you finish configuring the ring tones and rules, click the *Save Settings* button at the top of the page.

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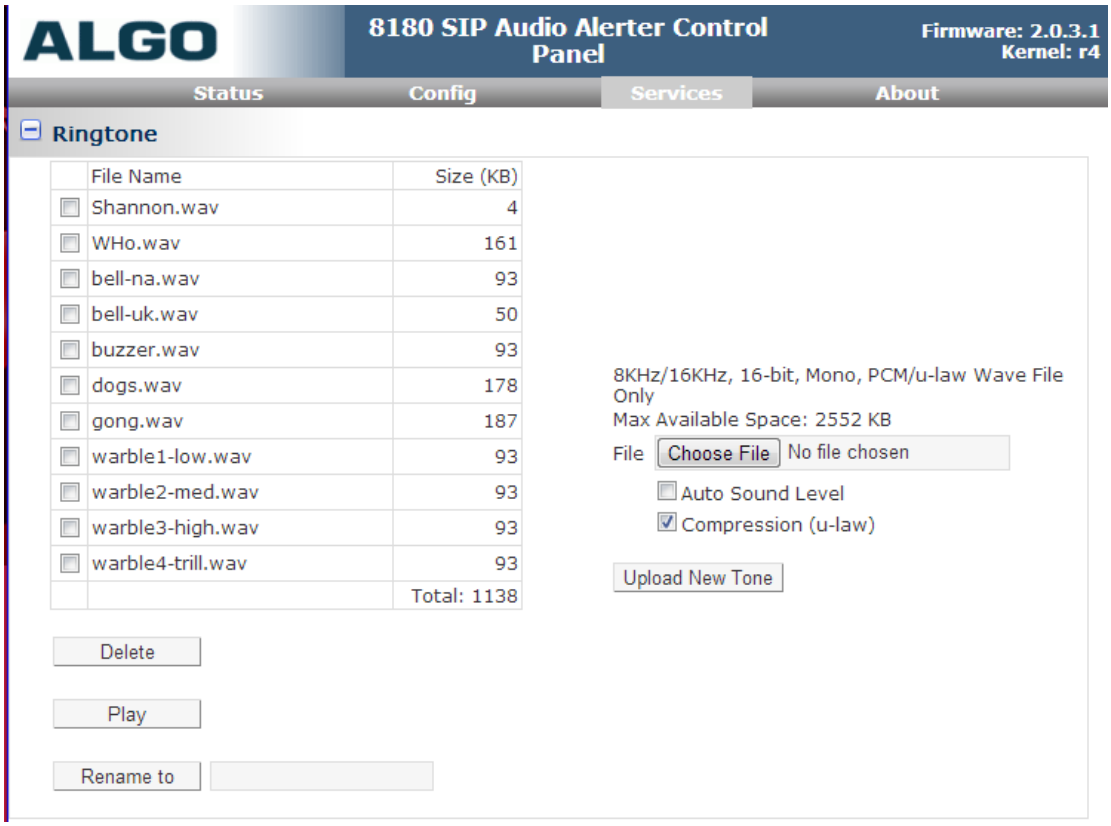
14 Uploading Ringtones

Ringtones can be uploaded to Algo 8180, and all ring tones can be managed from the web interface of the Algo Unit.

Ringtones must be: 8KHz or 16KHz, 16-bit, Mono, PCM or u-law Wave File format Only.

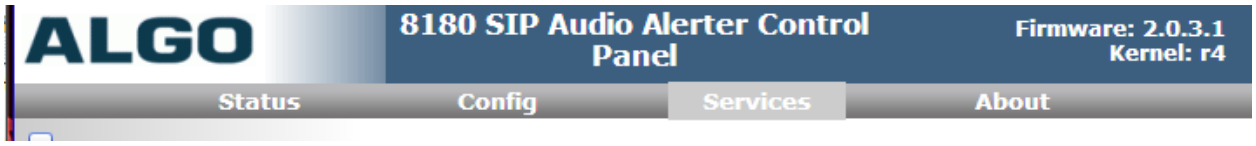


15 Upgrade 8180 Firmware

Periodically, new firmware for Algo8180 is released that either offers new functionality or addresses problems. Please consult with Algo or Zultys prior to upgrading, as the SIP TO option is currently custom-built for Zultys Channel Partners.

To determine if there is new firmware available for Algo 8180, please visit www.algosolutions.com/8180

1. From the top menu, click on *Services.*



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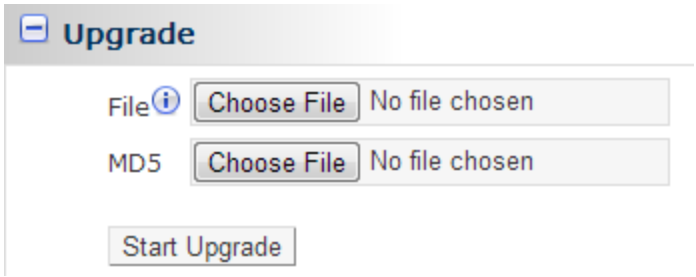
2. In the Settings section, click Reboot (Wait 30-60 seconds for the device to reboot and the web page to automatically reload.)

3. Login to the device again, and click on *Services.*
4. In the Upgrade section, click on Browse and select Algo 8180 firmware file to upload. Note that both the FW firmware and MD5 checksum files must be loaded.



5. Click *Start Upgrade.*
6. After the upgrade is complete, confirm that the firmware version has changed (refer to top right of Control Panel).

16 ZIP5xi Multicast Setup

You can configure a specific key on the phone from MX Administrator to send or receive a page to or from pre-configured multicast address(es). You can specify up to 5 listening multicast addresses on a ZIP5xi. In MX Administrator Navigate to the ZIP5 profile and select the Advanced tab of the device profile to configure Group Paging.

16.1 Phone Configuration from the Advance Tab of the ZIP5 profile

The Key can be any programmable key on a ZIP5 including:

- softkeyN type
- topsoftkeyN type
- prgkeyN type
- expmodX keyN type

Make sure that the following options are selected.

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- **KeyN value:** The multicast IP and port you will be paging.
- **KeyN Label**: The LCD label assigned to this key (if available).
- **KeyN Type**: Set to paging
- **KeyN Locked**: Optional, select to disable changes to this key from web interface of the phone.
- **paging group listening**: Allows you to specify up to 5 listening multicast addresses to send/receive a Real Time Transport Protocol (RTP) stream to/from these pre-configured multicast address(es).

16.1.1 Example 1 (57i)

In the below example we are creating a single page zone, which this phone can send pages to and receive pages from. The phone in this example is a 57i phone and the upper left key is the paging key.

- topsoftkey1 value : 224.0.0.2:10000
- topsoftkey1 label : Page
- topsoftkey1 type : paging
- topsoftkey1 locked : 0
- paging group listening : 224.0.0.2:10000

16.1.2 Example 2 (53e)

In the below example we are creating a single page zone, which this phone can send pages to and receive pages from. The phone in this example is a 53e phone and the upper left key is the paging key.

- prgkey1 value : 224.0.0.3:10000
- prgkey1 type : paging
- prgkey1 locked : 0
- paging group listening : 224.0.0.2:10000,224.0.0.3:10000

17 ZIP3xi Multicast Setup

You can configure a specific key on the phone from MX Administrator that will allow you to send or receive a page to or from pre-configured multicast address(es).

17.1 To Listen for Multicast paging

In MX Administrator Navigate to the ZIP3 profile and select the Advanced tab of the device profile to enable the ZIP3xi to listen to a Multicast page. Add the following lines to the advanced tab:

```
[ cfg:/phone/config/vpPhone/MulticastPage.cfg,reboot=0 ]
ListenAddress1.Label = Page_MC
ListenAddress1.IPAddress = 224.0.0.3:10000
```


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17.2 To Make Multicast pages

In MX Administrator Navigate to the ZIP3 profile and select the Advanced tab of the device profile to enable the ZIP3xi to make a Multicast page. Add the following lines to the Advanced tab. In the below example, the "Page" key is the 6th key (or the last/bottom key).

```
[ cfg:/phone/config/vpPhone/vpPhone.ini,reboot=1 ]
memory6.DKtype = 24
memory6.Line = 0
memory6.Value = 224.0.0.3:10000
memory6.PickupValue =
```


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