

X20 SIP Public Address Gateway User Guide

Software version v1.3.3

This document is subject to change without notice. The latest electronic version of this user guide is available for downloading here:
<http://www.zycoo.com/>

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1. About this User Guide

Thank you for choosing ZYCOO X20 SIP public address gateway!

This user guide is intended for the end-users, who will install, configure and use the device. Since the X20 SIP public address gateway could be configured and managed by the MX500 Paging and Intercom system, so you may refer to the user manual of MX500 system of automated and centralized configuration and management.

If you have questions about the installation or configuration, please contact ZYCOO support team. For more information, please visit www.zycoo.com.

2. Introduction

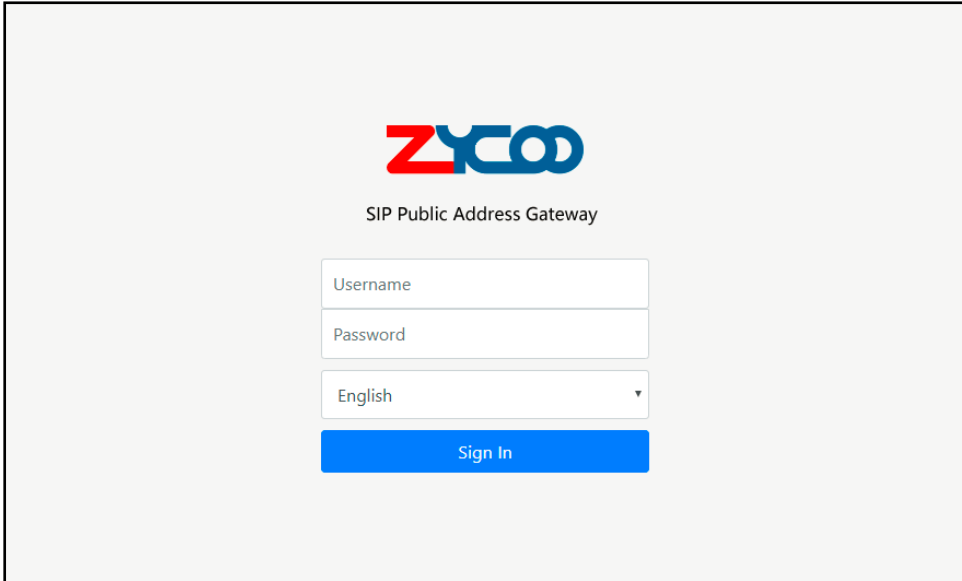
ZYCOO X20 SIP public address gateway is an innovative PA endpoint device developed by ZYCOO's European team. It converts voice streams from a SIP paging or IPPBX system to analogue sounds suitable for background music, public address system, intercom, etc.

The X20 has been developed using open SIP standards, ensuring that it works seamlessly with ZYCOO Paging and Intercom system and importantly, the X20 can also be deployed with most third party SIP PA and IPPBX systems that support SIP Protocol.

3. Web Interface Login

Please ensure there's reliable DHCP server in the local LAN. By default, X20 obtains IP address from DHCP server. By pressing both "Volume+" and "Volume-" buttons at the same time X20 will announce current IP address, input the IP address you heard in the Web browser address bar and press enter to access its Web interface.

The login screen will show up as below.

The image shows a web browser window displaying the login page for the ZYCOO SIP Public Address Gateway. At the top center is the ZYCOO logo, with 'ZY' in red and 'COO' in blue. Below the logo is the text 'SIP Public Address Gateway'. Underneath this, there are three input fields: 'Username', 'Password', and a language dropdown menu currently set to 'English'. At the bottom of these fields is a blue button labeled 'Sign In'.

Default username: admin.

Default password: admin.

4. Device Info

After login, it will first display the device info screen.

MAC Address:	68:69:2e:0d:00:03
IP Address:	192.168.11.190
Firmware Version:	v1.0
Model:	X20
SIP Extension:	
SIP Register Status:	Not Registered
Audio Output:	Speaker

The MAC address, current IP address, firmware version and device model will all be displayed here on this screen.

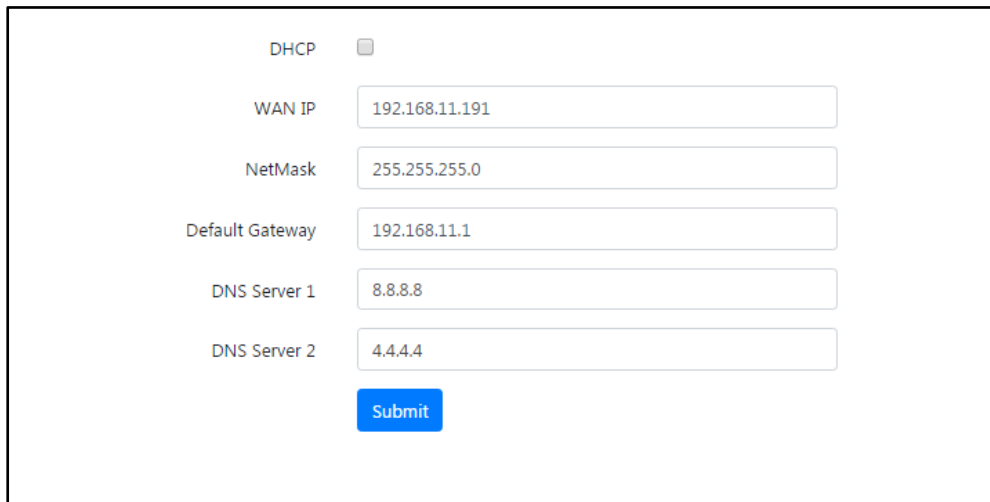
The SIP extension can be dialed from other phones or SIP microphone for intercom calls or live announcements.

SIP Register Status indicates the SIP extension register status, if SIP account is not configured or the account failed to register to SIP server, the status will be “Not Registered”, when the account is successfully registered, the status will be “Registered” and now the X20 device is ready for intercom calls or paging.

Audio Output indicates the mode of audio output on this X20, if “Speaker” mode, it supports 2x10W audio output from the Speaker interface; if “Headset” mode, it supports 2x40mW audio output from headset interface.

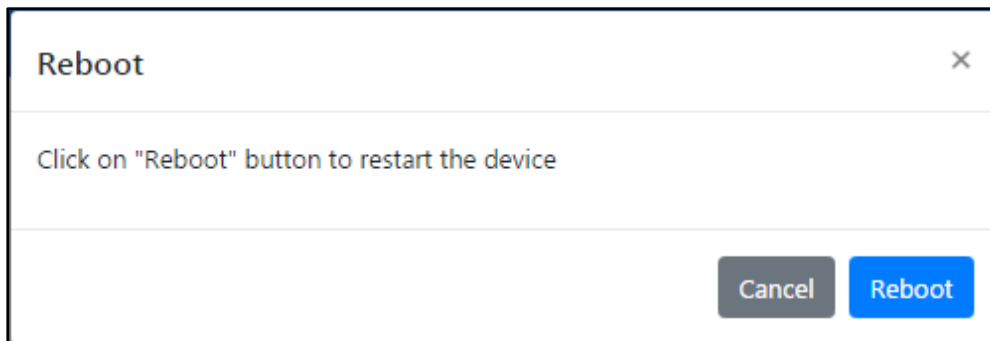
5. Network

By default, X20 has been configured to DHCP network mode. Normally, if you have reliable DHCP server in the local network, you don't have to modify any network parameters. If you want to configure X20 with static IP address, you may disable the "DHCP" option and manually input network parameters as shown below.



The image shows a network configuration interface. At the top, there is a 'DHCP' label followed by an unchecked checkbox. Below this, there are five input fields for static network configuration: 'WAN IP' (192.168.11.191), 'NetMask' (255.255.255.0), 'Default Gateway' (192.168.11.1), 'DNS Server 1' (8.8.8.8), and 'DNS Server 2' (4.4.4.4). A blue 'Submit' button is located at the bottom of the form.

Changing network profiles requires restarting the device, please click on "Reboot" button to restart the device and after 40 second you may access it via the new IP you have configured.



The image shows a 'Reboot' dialog box. It has a title bar with the word 'Reboot' and a close button (X). The main text inside the dialog says 'Click on "Reboot" button to restart the device'. At the bottom right, there are two buttons: a grey 'Cancel' button and a blue 'Reboot' button.

If you don't want to reboot now, the modification will take effect the next time you reboot the device.

6. SIP Settings

6.1 SIP Basic

You may configure the SIP account of X20 paging gateway on the SIP Settings screen, but when working with MX500 SIP Paging and Intercom system, the X20 paging gateway can be auto configured by MX500 system from the MX500 Web interface. While working with other SIP servers you may configure SIP account here.

The screenshot shows the 'SIP Basic' configuration interface. It features four tabs: 'SIP Basic' (active), 'Advanced', 'Audio Codecs', and 'Auto Answer'. The 'SIP Basic' tab contains the following fields:

- Server Address:** A text input field containing '192.168.11.10'.
- SIP Extension:** A text input field containing '888'.
- Password:** A text input field with masked characters (dots).
- Activate:** A checkbox that is checked.

A blue 'Submit' button is located below the 'Activate' checkbox.

- **Server Address:** The IP address or domain of the SIP server. If the server is not using the default SIP port 5060, you'll have to specify the port number along with the server address, e.g. 192.168.11.10:5666.
- **SIP Extension:** Valid extension number on the SIP server.
- **Password:** Password of the above extension number.
- **Activate:** Tick this option to activate this account, otherwise the account will not be registered.

6.2 Advanced SIP Settings

Some advanced SIP settings could be modified when necessary.

The screenshot shows a web interface for configuring SIP settings. At the top, there are four tabs: "SIP Basic", "Advanced", "Audio Codecs", and "Auto Answer". The "Advanced" tab is currently selected. Below the tabs, there are four configuration items, each with a label and a text input field:

- SIP Port:** The input field contains the value "5060".
- RTP Port:** The input field contains the value "7078".
- Register Expires:** The input field contains the value "200".
- DTMF Mode:** The input field is a dropdown menu showing "rfc2833".

Below these fields is a blue button labeled "Submit".

- SIP Port: The default local SIP signaling port.
- RTP Port: The default local RTP port.
- Register Expires: The expiration time of SIP registration, when register expires X20 will send register request again.
- DTMF Mode: Normally, just use the default DTMF mode, only when X20 has its customized keypad and DTMF keys cannot be recognized then you'll have to modify it.

6.3 Audio codecs

X20 supports various types of audio codecs. You may enable audio codecs according to which are supported by the SIP server.

G.722 is the wideband HD audio codec.

SIP Basic
Advanced
Audio Codecs
Auto Answer

speex/16000	<input type="checkbox"/>	speex/8000	<input checked="" type="checkbox"/>
pcmu/8000	<input checked="" type="checkbox"/>	pcma/8000	<input checked="" type="checkbox"/>
g729/8000	<input checked="" type="checkbox"/>	speex/32000	<input type="checkbox"/>
AAL2-G726-40/8000	<input type="checkbox"/>	AAL2-G726-32/8000	<input type="checkbox"/>
AAL2-G726-24/8000	<input type="checkbox"/>	AAL2-G726-16/8000	<input type="checkbox"/>
G726-40/8000	<input type="checkbox"/>	G726-32/8000	<input type="checkbox"/>
G726-24/8000	<input type="checkbox"/>	G726-16/8000	<input type="checkbox"/>
L16/44100	<input type="checkbox"/>	G722/8000	<input type="checkbox"/>
GSM/8000	<input checked="" type="checkbox"/>		

Submit

6.4 Auto Answer

X20 could be configured to auto answer SIP calls or you may set up a delay before it answers the call.

SIP Basic
Advanced
Audio Codecs
Auto Answer

Auto Answer ☒

Delay

10 ▼

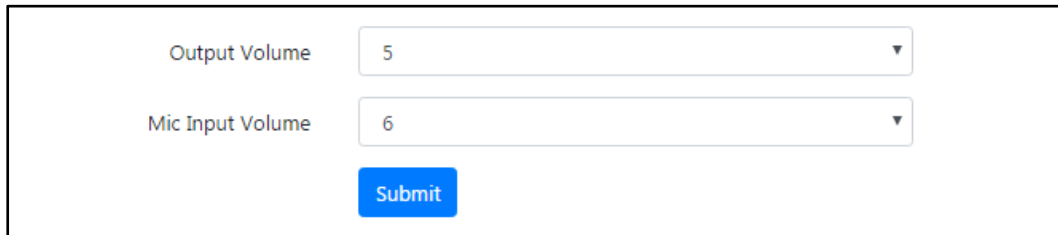
Submit

When “Auto Answer” is selected and you call the extension of X20, it will answer immediately without any delay, and you may speak right away to deliver an intercom call or live announcement.

When “Auto Answer” is deselected and you’ll have to choose a time of delay for X20 to answer those calls, for example 10 has been choose as the delay, when you make a call to this X20 extension number, it will ring for 10 seconds, after that it will answer the call and you can deliver an intercom call or live announcement.

7. Volume Control

The audio output volume can be controlled by using the “Volume+” and “Volume-” keys and through the Web interface as well.



The image shows a web interface for volume control. It contains two horizontal sliders. The first slider is labeled 'Output Volume' and has a value of 5. The second slider is labeled 'Mic Input Volume' and has a value of 6. Below the sliders is a blue button labeled 'Submit'.

There are 10 levels of the audio output volume and microphone input volume.

You may adjust the audio output level according to the environment conditions both by using the physical buttons and through the Web interface.

As for microphone volume input level, only when microphone has been connected otherwise there's no need to adjust microphone input volume level.

8. Security Settings

8.1 Intercom and GPIO

X20 can be integrate with 1-2 button for one key intercom and one key dial functions, it may also combined with any sensor which can auto trigger an emergency intercom or dial functions.

Normally, when x20 works with a MX500 PA system, the number of one key dial or auto trigger can be auto configured in MX500's web GUI. If you are using third party SIP server, you may need to configure the number manually.



Intercom and GPIO

Intercom 1

Intercom 2

GPIO Dial

Repress Cancel ☒

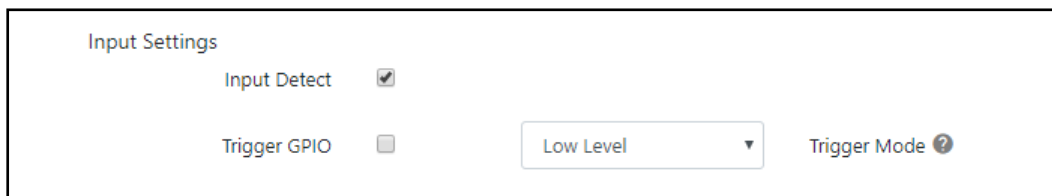
As the picture shows, user just need to input the number where emergency calls target.

About the sensor auto trigger function, when the input cable (D_IN) received the message from any sensors, if you ticked the "Auto Trigger" function, the x20 will auto dial the number you configured before to make a emergency board-casting. With MX500's auto trigger function, it may also make board-casting to all the PA zones connected with MX500.

Press the button again to close the emergency board-casting or cancel the emergency dial.

8.2 Input Settings

Setup the X20 input cable (D_IN), this cable can be connect to any third party sensors.



Input Settings

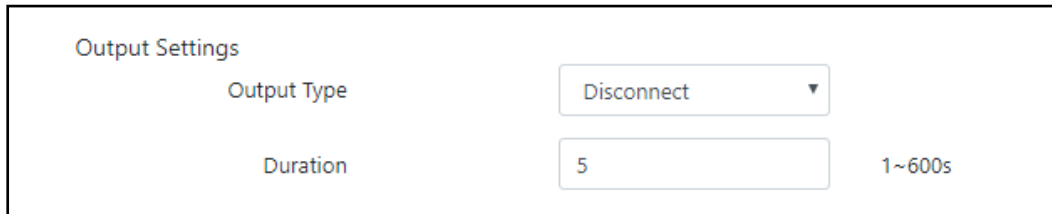
Input Detect ☒

Trigger GPIO ☐ Low Level ▼ Trigger Mode ?

As this picture shows, tick the input detect to active the input checking service. Tick the trigger GPIO to active the auto trigger function.

8.3 Output Settings

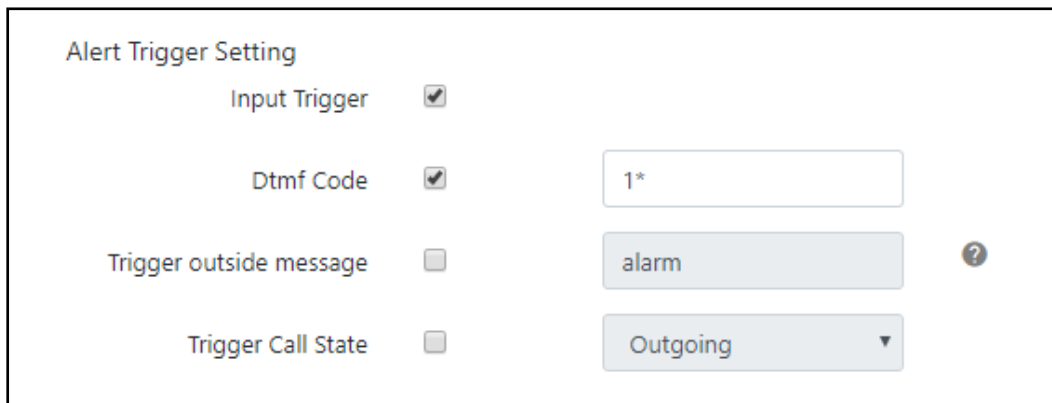
The output cable of x20 is designed for some third party access control like electronic door lockers.



As picture shows, set up the output cable.

8.3 Alert Trigger Setting

Setup the alert trigger setting to definite how the output cable works with input cable.



As picture shows,

- A. Ticked the input trigger means when input cable received all the information, the output cable will auto trigger.
- B. DTMF code means when users dial the correct DTMF trigger number then the output cable will trigger.(Currently the X20 can only support RF2833)
- C. Trigger outside message.

Trigger URL :

```
http://x20_ipaddr/cgi-bin/spkcfg.cgi?sos_msg POST
{"Message":"alarm"}
```

Trigger succeed : succeed

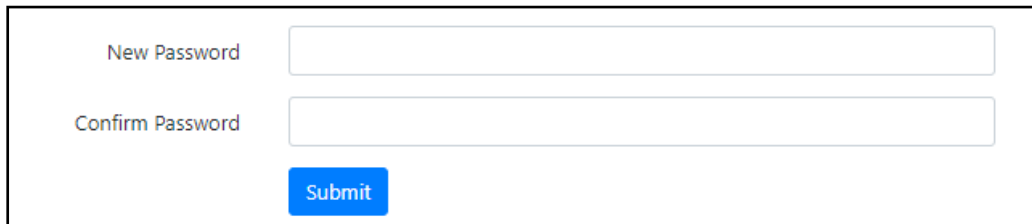
Trigger failed : failed

D: Trigger with dialing, tick this for trigger when dialing, hang up, incoming or outgoings.

9. System

9.1 Change Password

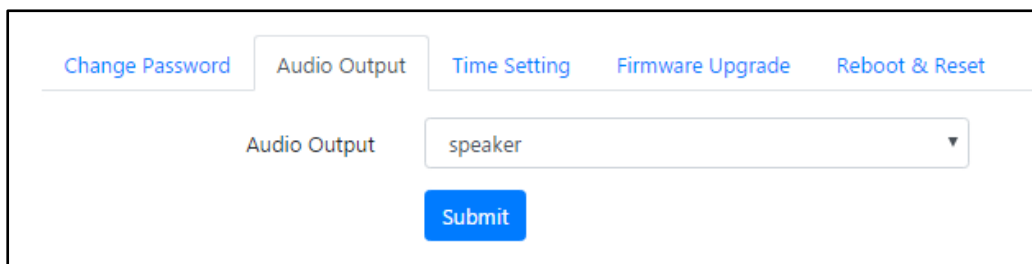
The password of login to the X20 web interface could be changed for security precautions. But the user name could not be changed.



A web form for changing the password. It contains two text input fields: "New Password" and "Confirm Password". Below the "Confirm Password" field is a blue "Submit" button.

9.2 Audio Output

The audio output mode could be configured as "Speaker" or "Headset".



A web form for configuring the audio output mode. At the top, there are five tabs: "Change Password", "Audio Output", "Time Setting", "Firmware Upgrade", and "Reboot & Reset". The "Audio Output" tab is selected. Below the tabs, there is a label "Audio Output" and a dropdown menu with "speaker" selected. Below the dropdown menu is a blue "Submit" button.

In Speaker mode, you may connect loud speakers/passive speakers to the "Speaker" interfaces, the output power is up to 2x10W(dual-channel), 8Ω impedance.

In Headset mode, you may connect headphones or external power amplifier, the output power is 2x40mW, 16Ω impedance.

9.3 Time Setting

If X20 is auto configured by the MX500 SIP paging and intercom system, time will be synchronized from MX500 system as well. If X20 is not working with MX500 then you may set it to synchronize time from the internet time server.

On the Time Settings screen, you may check the current time, if it's not correct you may click on the "Manual Sync" button to synchronize time from the NTP server (please ensure X20 has network connectivity), if the default time zone is in the different zone as yours please change the time zone and then synchronize the device time from NTP server.

9.4 Firmware Upgrade

ZYCOO will regularly release new firmware for bug fixes and new features, please visit our official website for the latest firmware.

When downloaded you'll get a .zip file, please extract it with WinRAR and upload with the extracted file to upgrade the device firmware.

9.5 Reboot & Reset

X20 could be restarted or reset from within the web interface.

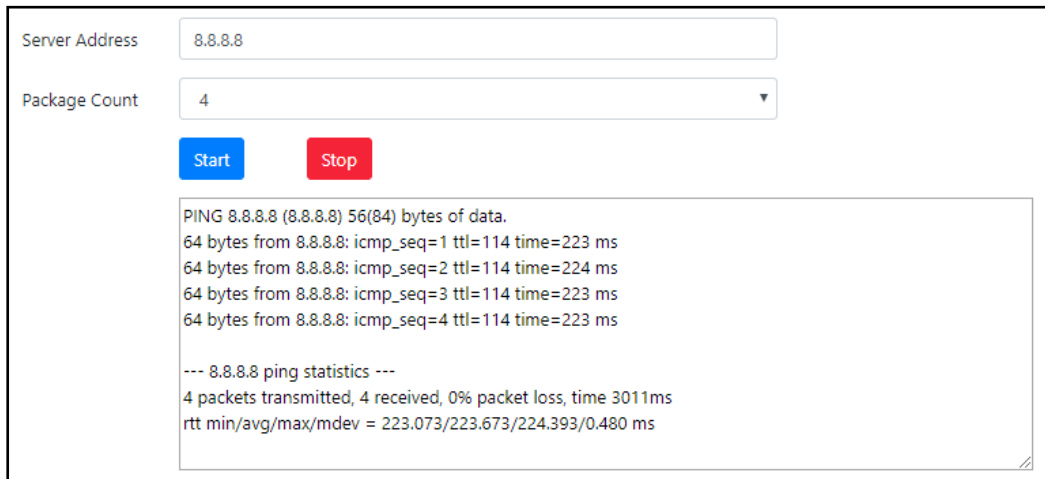
Restart the X20 device will take around 40 seconds to resume X20 back online.

While reset X20 will clear all user configurations. You may do it within the web interface, or you may do it by holding the RST button for 5 seconds till SYS LED off to reset.

10. TroubleShoot

10.1 PING

PING is to check the network connection of X20



The screenshot shows a web-based interface for a PING utility. It includes a 'Server Address' input field with '8.8.8.8', a 'Package Count' dropdown menu set to '4', and 'Start' and 'Stop' buttons. Below these is a text area displaying the results of the ping command.

```
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.  
64 bytes from 8.8.8.8: icmp_seq=1 ttl=114 time=223 ms  
64 bytes from 8.8.8.8: icmp_seq=2 ttl=114 time=224 ms  
64 bytes from 8.8.8.8: icmp_seq=3 ttl=114 time=223 ms  
64 bytes from 8.8.8.8: icmp_seq=4 ttl=114 time=223 ms  
  
--- 8.8.8.8 ping statistics ---  
4 packets transmitted, 4 received, 0% packet loss, time 3011ms  
rtt min/avg/max/mdev = 223.073/223.673/224.393/0.480 ms
```

As picture shows, check the network connection in the status box here.

10.2 TCP Dump

X20 combined TCPDUMP of linux. This tools can check all the information of the VoIP status from the network data.

The 2 network cables of X20 is under bridge connection, no need to choose check which one of them, just simply click the start checking and stop checking then your browser with download all the information of the network data. And then you can check all the data with Wireshark.