2340 S River Road, Suite 406
Des Plaines, IL 60018 U.S.A.
Tel 877-724-3387
www.digitalacoustics.com

IP7-MZC-FD Application Guide

The IP7-MZC-FD Multi-Zone Controller is a network audio endpoint that provides the ability for a central station call center to communicate with up to forty-eight zones of microphones and speakers (full-duplex) through a single IP audio connection. It also includes the ability to add an analog telephone that can be used for private audio conversations with the call center over the IP connection. Any combination of microphone and/or speaker zones can be turned on and off by the call center operator either through custom applications or via a SIP based phone system.

This Application Guide presents some of the ways customers can integrate the IP7-MZC-FD into their Alarm Monitoring system (which may have additional information on each of the zones the IP7-MZC-FD is monitoring).

IP7-MZC-FD Configuration Options

Using the TalkMaster FOCUS Administrator Console, select the **IP Endpoints** → **Configuration** tab. The IP7-MZC-FD can be configured as a **TalkMaster Client**, a **SIP Client** or a hybrid **TalkMaster/SIP client**. The *TalkMaster FOCUS .NET Console SDK* can be used to develop custom applications if the IP7-MZC-FD is configured as a TalkMaster Client or hybrid TalkMaster/SIP client. DTMF commands can be used to control it if configured as a SIP Client.

The IP7-MZC-FD supports up to 48 full duplex audio zones created by attaching 1 or more IP7-ZX4L expansion boards (each IP7-ZX4L adds four speaker/microphone zones). The IP7-MZC-FD detects the number of IP7-ZX4L's attached at startup and calculates the number of available zones.

The IP7-MZC-FD includes:

- An onboard speaker and a switch to enable it (used for testing)
- An onboard microphone and a switch to enable it (used for testing)
- An RJ-11 connector for an analog telephone

Audio between the Call Center and the IP7-MZC-FD is always available to the onboard speaker and microphone (if enabled by the switches) and to the analog telephone if it's handset is taken off-hook. A command must be received from the central station in order to turn on or off zones on the attached IP7-ZX4L zone boards.

The IP7-ZX4L Expansion boards include:

- Four 1 watt speaker terminals
- Four analog speaker volume controls
- Four 12V powered Line Level Microphone terminals (2-wire or 3-wire)
- Four analog microphone sensitivity controls

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- Four output pins to record microphone audio to a DVR

On the **IP Endpoints → Options 2** tab, press the **Set** button next to **Audio Profile** and select the **IP7-MZC** to set the proper output volume gain. Use the analog speaker and microphone controls on the IP7-ZX4L to set the speaker volume level and microphone sensitivity level for each zone.

Communications with an IP7-MZC-FD can be initiated from the call center to the IP7-MZC-FD from a TalkMaster console application or by dialing a SIP extension. The IP7-MZC-FD may also initiate contact with the call center by lifting the handset of the analog telephone or activating it's **Talk** button. The IP7-MZC-FD will either place an incoming call to TalkMaster or by dial a SIP Extension at the call center. Based on the configuration options, the handset of the analog telephone and/or **Talk** switch can:

- Do nothing
- Send an Off-Hook event that can be processed using the .NET SDK
- Signal an Incoming Call to TalkMaster
- Dial a SIP extension

If an analog handset is attached and the configuration option **IP Endpoints → ZC → Zone Controller has handset** has been set, the **Off-Hook Activates PTT** option affects the operation of picking up the analog telephone's handset or activating the Talk switch:

IP7-MZC-FD Configuration Options			**Action Performed When:**	
Type	**SIP Type**	**Off-Hook Activates PTT**	**Handset Goes Off Hook**	**Talk Button Engaged**
Client	Not a SIP Device	No	Incoming Call	Incoming Call
Client	Not a SIP Device	Yes	Ring / Incoming Call	No Action
Client	SIP Extension Only	No	Incoming Call	Incoming Call
Client	SIP Extension Only	Yes	Ring / Incoming Call	No Action
Client	Dial SIP Extension on PTT	No	Incoming Call	SIP Call
Client	Dial SIP Extension on PTT	Yes	Ring / SIP Call	SIP Call
SIP StandAlone	SIP Extension Only	No	No Action	No Action
SIP StandAlone	SIP Extension Only	Yes	Ring Only	No Action
SIP	Dial SIP Extension	No	No Action	SIP Call

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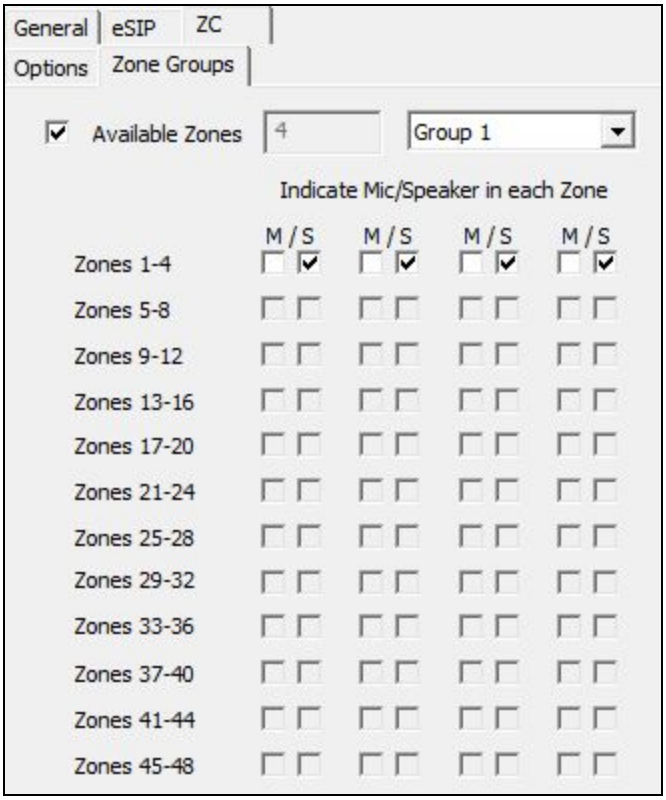
StandAlone	on PTT			
SIP StandAlone	Dial SIP Extension on PTT	Yes	Ring / SIP Call	SIP Call

Zone Groups - The IP7-MZC-FD can have up to 48 zones of microphones and/or speakers which can be programmatically activated in any combination. For convenience, the device can be configured with up to eight **Zone Groups** that specify a set of pre-defined microphone and speaker zones. Additionally, Zone Group 0 turns off all zones and Zone Group 9 turns on all zones. The Zone Groups are defined using configuration option **IP Endpoints → ZC → Zone Groups**



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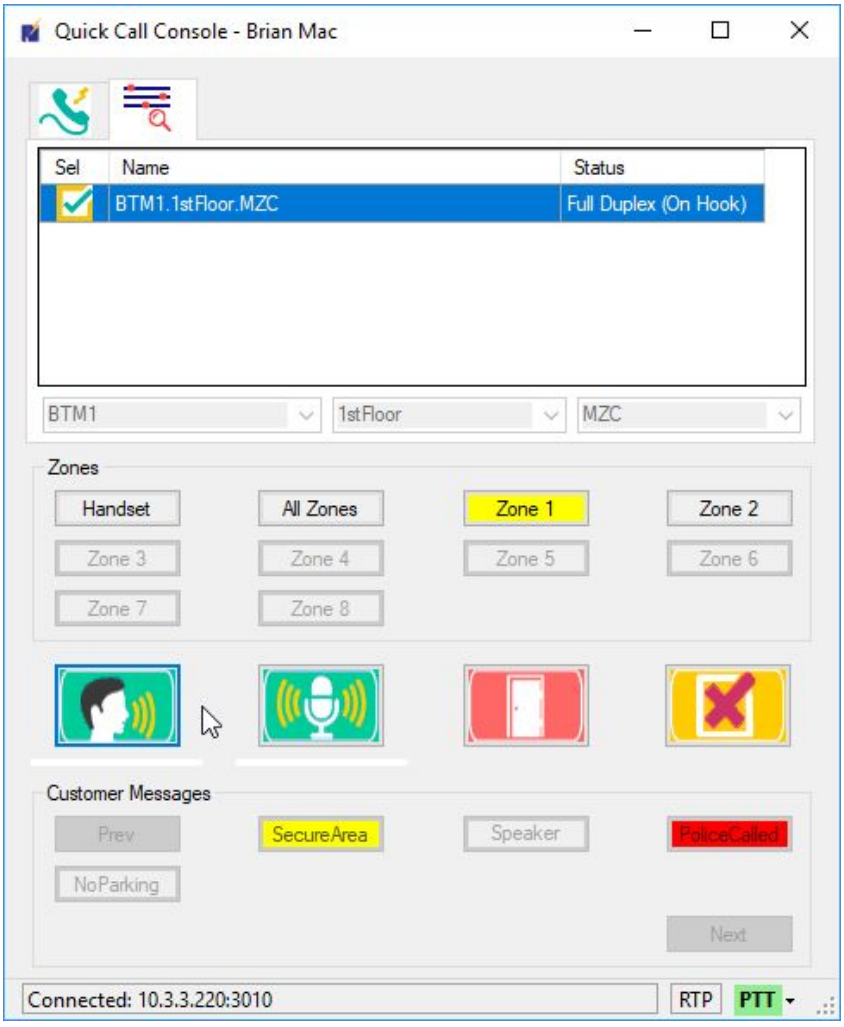
TalkMaster FOCUS - QuickCall Console

The **QuickCall Console** supports the IP7-MZC-FD when configured as a TalkMaster Client. The QuickCall Console supports:

- Detection of an Incoming Call
- Initiation of an Outgoing Call
- Automatic detection of the analog Handset initiating a call or going Off-Hook during a call
- Selection of a pre-defined Zone Group or the Handset
- Full Duplex Audio with the ability to mute the Console's microphone
- Sending a pre-recorded audio file to the Active Zone(s)
- Activating the IP7-MZC-FD's onboard "double pole double throw" relay



This option does not provide any integration with a custom central station alarm system, so the Zones need to be standardized in order for the QuickCall Operator to understand which zones they are controlling.

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TalkMaster - Custom Console

When the IP7-MZC-FD is configured as a TalkMaster Client (or a hybrid TalkMaster/SIP client), the TalkMaster FOCUS .NET SDK can be used to develop applications to monitor and control it. The SDK has the ability to:

- Monitor the connection status of the IP7-MZC-FD
- Monitor the On-Hook/Off-Hook status of the attached analog phone
- Detect incoming TalkMaster calls
- Initiate outgoing TalkMaster calls
- Initiate outgoing SIP calls
- Hang Up a SIP call
- Turn on/off individual speakers and/or microphones in each audio zone
- Turn on/off pre-defined audio Zone Groups
- Send/Receive live audio
- Send pre-recorded audio
- Activate the IP7-MZC-FD's onboard "double pole double throw" relay

When a call is ended, the application should turn off any zones that are currently active.

Consult the ***TalkMaster FOCUS .NET Console SDK Reference Manual*** for complete details.

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SIP StandAlone

Once a SIP call has been initiated, DTMF commands can be sent to the IP7-MZC-FD to:

- Turn on/off individual speakers and/or microphones in each audio zone
- Turn on/off pre-defined Zone Groups
- Activate the IP7-MZC-FD's onboard "double pole double throw" relay

Please note: *The IP7 only recognizes Out of Band DTMF codes*

To activate the audio zones attached to the IP7-MZC-FD (Multi-Zone Controller), DTMF commands may be sent across the active SIP channel via software control or via the phone's keypad. Each digit must be sent within 3000ms of the previous key or the command will timeout.

A #9 followed by 24 ASCII digits indicates the mics and/or speaker on each of the 12 Zone Extension boards to be controlled:

- Two ASCII digits are used for each zone extension board. The first digit represents the 4 mics and the second digit represents the 4 speakers
- Each ASCII digit is constructed as a hex "nibble" or four bits to indicate the audio path that needs to be activated. So:
    - 0001 = 1 = 1st mic or speaker
    - 0010 = 2 = 2nd mic or speaker
    - 0100 = 4 = 3rd mic or speaker
    - 1000 = 8 = 4th mic or speaker
- The bits are added together resulting in a digit with value of 0 - F.
- If the resulting value is equal to 10 (hex A), substitute an (A) keypress
- If the resulting value is equal to 11 (hex B), substitute a (B) keypress
- If the resulting value is equal to 12 (hex C), substitute a (C) keypress
- If the resulting value is equal to 13 (hex D), substitute a (D) keypress
- If the resulting value is equal to 14 (hex E), substitute an asterisk (*) keypress
- If the resulting value is equal to 15 (hex F), substitute a pound sign (#) keypress

Here are a few examples:

- To turn on the 1st mic and 1st speaker on the first Zone Extension board, send #911000000000000000000000
- To turn on all four mics and all four speakers on the first Zone Extension board send #9##000000000000000000000
- To turn on the first speaker on the first and second Zone Extension board (zones 1 and 5), send
- #901010000000000000000000

The selected Zones will stay activated till a new zone activation command is sent. The zones are automatically deactivated when the SIP call is ended

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To activate all of the speakers and/or microphones in a Zone Group, a * followed by a single numeric digit indicates:

- The Zone Group (1-8) to activate
- *0 is reserved for “Turning off all Zones”
- *9 is reserved for “Turning on all Zones”

For additional details, contact Digital Acoustics Technical Support.