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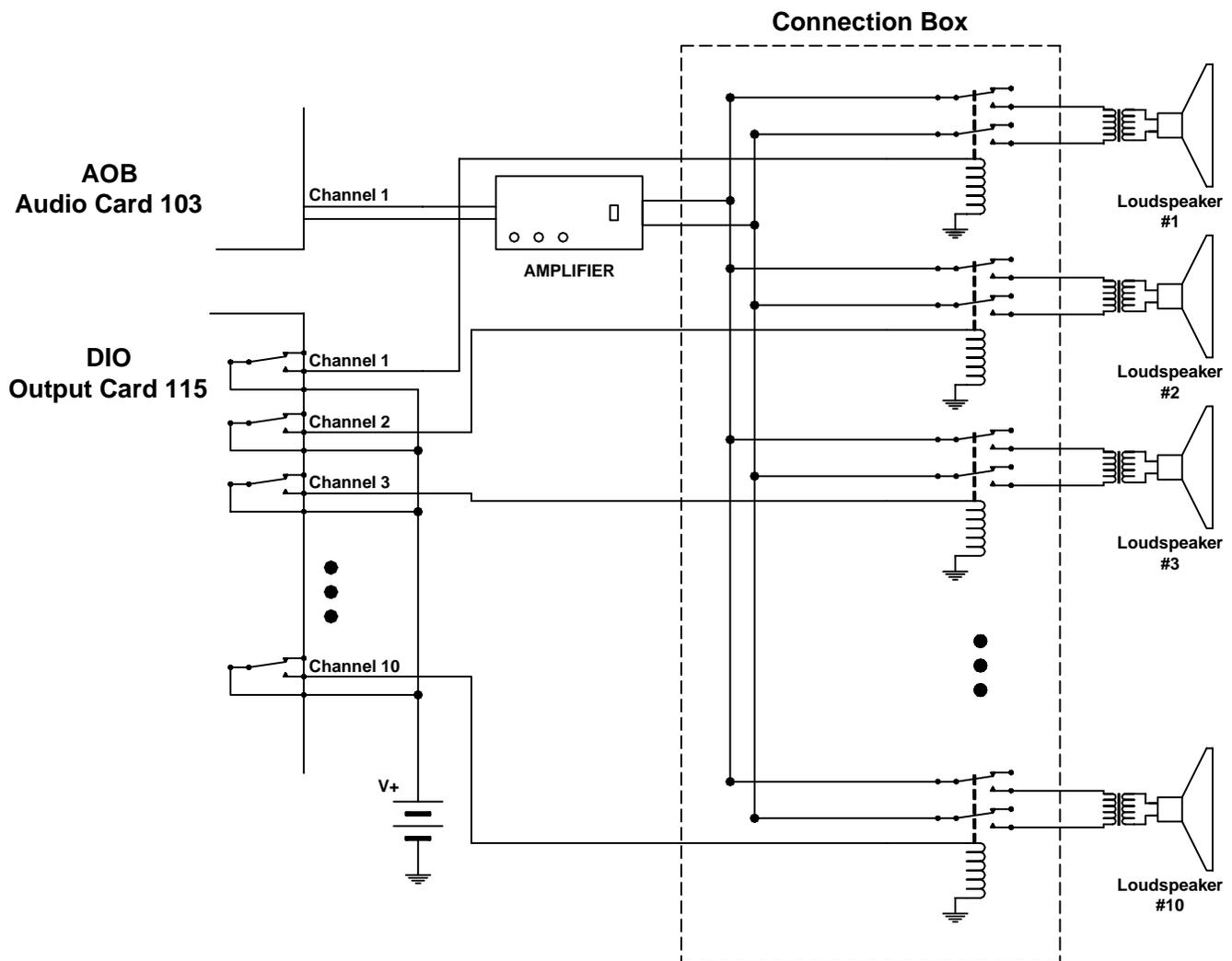
## 1. Intent & Scope

This Application Note describes, by means of an example, how to configure paging amplifiers using DIO relay outputs to select zones.

## 2. Description

The DXI system SAC software allows the use of AOB/AIO output boards to access paging to outside amplifiers, while still allowing zone selection using relays on DIO cards.

The following example is used to describe a typical application.



### Paging Example Using DIO Outputs to Control Selected Speakers

In the above example the audio output from Channel 1 of an Audio Output Board in slot 103 is used to drive an external audio amplifier. The output of this amplifier can be connected to or disconnected from ten individual loudspeakers. The connection box (circuitry enclosed within the dashed box) is meant to convey the conceptual operation of the system. The relay connections shown may not be appropriate, as they could result in 'clicks' and

'pops' if the audio circuit is active before the relays close In the DXI system the audio connection is made after all the connection path outputs have been completed. In this example this means the DIO outputs are activated before the audio is connect is made. However the delay is in the order of tens of milliseconds and may not be sufficient to allow for the closure of the external relays.

In this simplified connection box ten relays are used to connect or disconnect the amplifier audio to the ten loudspeakers. Each relay is individually controlled by a DIO output. In this example channels 1 to 10 of a DIO card in slot 115 are used to control the relays. (The example shows the DIO with a form-C relays output. An open collector current sinking transistor could also be used as the output.)

In this example we want to define ten page zones so that we can broadcast to each individual loudspeaker. It is also required that an all page zone is defined so that we can broadcast to all ten loudspeakers simultaneously

### 3. Overview

The process to set up switched paging zones is as follows:

For each external amplifier, you need to define one "PageAmp" station that configures the AOB/AIO audio output channel into the amplifier. This document will refer to this channel as an AOB channel; however any reference to AOB also can refer to an AIO board.

For each zone relay, you need to define one "Page" station that configures the DIO relay to trigger for this zone.

For each page zone, you need to include the "PageAmp" station ID, along with all "Page" relay station IDs that should trigger when this zone is paged.

### 4. Setup

#### 4.1 Hardware configuration:

##### 4.1.1 PageAmp Station setup:

For each external amplifier, you need to define a "PageAmp" station that defines the output from the DXI AOB card into the external amplifier.

From the Maintenance menus, select "Edit/Modify Hardware", then select the "Station" database. Use the F10 key to create a new station for the AOB output channel. The first page of the station database will appear as shown on the right

```

↓ / Enter: Next Field.          ↑: Previous field.          Home: Next Page
←/→: Select                    PgUp/PgDn: Next/previous entry  End: Quit
                                F8: Renumber   F9: Delete  F10: Add      F1: Help
                                Page 1 of 2
Station ID:                    10000
Station type:                  PageAmp
Audio card ID:                 103
Audio resource:                1
Video In Res 1:                0.0          (Card Resource.Preset)
Video In Res 2:                0.0          (Card Resource.Preset)
Video In Res 3:                0.0          (Card Resource.Preset)
Video In Res 4:                0.0          (Card Resource.Preset)
VideoOut card ID:              0
VideoOut resource:             0
Output card:                   0
Output resource:               0
Exchange:                      1
Station has LED:                0          (0=No 1=Yes)
Station camera list:
Stn-camera map:
Alarm FAAS Pt:                 0.1.1
Dsbl FAAS Pt:                  0.0.0
Fault FAAS Pt:                 0.1.2
Secondary FAAS pt:             0.0.0
Full duplex:                   0          (0=Half 1=Full)
Sidetone:                      0          (0=Off 1=On)
    
```

Change the following settings:

Station ID: Station number of AOB output (entered when creating the station)  
 Station Type: PageAmp  
 Audio Card ID: Enter card number of AOB output  
 Audio Resource: Enter channel number of AOB output  
 Output Card: 0  
 Output Resource: 0  
 Exchange: Enter exchange number that the AOB card cage is controlled by (usually 1)

In this case, the station 10000 will be used for this AOB output, on AOB card 103.1.

Station ID: 10000 (entered when creating the station)  
 Station Type: PageAmp  
 Audio Card ID: 103  
 Audio Resource: 1  
 Output Card: 0  
 Output Resource: 0  
 Exchange: 1

#### 4.1.2 Page Station setup:

For each zone relay, you need to define a "Page" station that defines the relay to turn on when this zone output is selected.

From the Maintenance menus, select "Edit/Modify Hardware", then select the "Station" database. Use the F10 key to create a new station for the DIO relay channel using the F10 key. The first page of the station database will appear as shown on the right.

```

↓ / Enter: Next Field.          ↑: Previous field.          Home: Next Page
← / →: Select                PgUp/PgDn: Next/previous entry  End: Quit
                                F8: Renumber   F9: Delete   F10: Add     F1: Help
                                Page 1 of 2
Station ID:      10001
Station type:    Page
Audio card ID:   0
Audio resource:  0
Video In Res 1: 0.0      (Card Resource.Preset)
Video In Res 2: 0.0      (Card Resource.Preset)
Video In Res 3: 0.0      (Card Resource.Preset)
Video In Res 4: 0.0      (Card Resource.Preset)
Video Out card ID: 0
Video Out resource: 0
Output card:     115
Output resource: 1
Exchange:        1
Station has LED: 0      (0=No 1=Yes)
Station camera list:
Stn-camera map:
Alarm FAAS Pt:  0.1.1
Dsbl FAAS pt:   0.0.0
Fault FAAS Pt:  0.1.2
Secondary FAAS pt: 0.0.0
Full duplex:    0      (0=Half 1=Full)
Sidetone:       0      (0=Off 1=On)
    
```

Change the following settings:

Station ID: Station number of DIO output (entered when creating the station)  
 Station Type: Page  
 Audio Card ID: 0

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Audio Resource: 0  
Output Card: Enter card number of DIO output  
Output Resource: Enter channel number of DIO output  
Exchange: Enter exchange number that the DIO card is controlled by (usually 1)

In this example, ten stations with ID numbers 10001-10010 will be used for 10 relay outputs, on DIO card 115 channels 1 to 10. Create 10 new stations using the F10 key and change the following parameters

Station ID: 10001  
Station Type: Page  
Audio Card ID: 0  
Audio Resource: 0  
Output Card: 115  
Output Resource: 1  
Exchange: 1

...

Station ID: 10010  
Station Type: Page  
Audio Card ID: 0  
Audio Resource: 0  
Output Card: 115  
Output Resource: 10  
Exchange: 1

## 4.2 Software configuration:

### 4.2.1 PageAmp Station setup:

To complete the configuration for the external amplifier, you need to perform the following steps:

From the Administration menus, select “Edit/Modify Software”, then select the “Station” database. Go to the station you created for the AOB output channel.

Some of the parameters that need to be set are found on page 1 of the station database (shown on the right), while the remaining settings are found on page 2

↓ / Enter: Next Field. ←/→: Select	↑: Previous field. PgUp/PgDn: Next/previous entry	Home: Next Page End: Quit F1: Help
Station ID: 10000	Page 1 of 11	
Name (English): Ext Amp 1		
Name (French): ?		
Name (Spanish): ?		
Master:		
ERQ timeout: 60	(seconds)	
Pulse output length: 8	(.125 second increments)	
LED flash on CRQ: 1	(0=Off 1=Flash 2=Solid)	
Station group list:		
Event priorities:		
Output when done: 6	(0=On 6=Off)	
Alternate ON list:		
Alternate OFF list:		
Interlock list:		
Page amp station:	(for Page stations)	
Addl Output list:		
Monitor Output on:	(0 = on 1 = off)	
Camera starts on:	(0 = Call 1 = CRQ)	

Change the following settings:

- Station ID: Station number of AOB output (entered when creating the station)
- Name (English): Enter a description for this output
- Master: 0 (any value will do)
- Station group list: Enter the list of DIO relay stations this audio output is associated with
- Page amp station: 0
- Initial volume: Enter volume level for the AOB output (0-7), 6 is generally used for line level sources
- Output level: 1 (line level)
- Auto PTT Output: 1 (if you are using the AOB channel output relay to turn on or “un-make” your amplifier), or 0 otherwise

In this case, the station 10000 will be used for this AOB output, with 10001-10010 for the relay outputs.

- Station ID: 10000 (entered when creating the station)
- Name (English): Ext Amp 1
- Master: 0
- Station group list: 10001-10010
- Page amp station: 0
- Initial volume: 6
- Output level: 1
- Auto PTT Output: 0

#### 4.2.2 Page Station setup:

To complete the configuration for each relay, you need to perform the following steps:

From the Administration menus, select "Edit/Modify Software", then select the "Station" database. Go to the station(s) you created for the DIO relay channel(s).

Change the following settings:

Station ID:	Station number of DIO output (entered when creating the station)
Name (English):	Enter a description for this output
Master:	0 (any value will do)
Station group list:	(leave blank)
Page amp station:	Enter station number of AIO output

In this example, the station 10000 will be used for this AOB output, with 10001-10010 for the relay outputs.

Station ID:	10001 (entered when creating the station)
Name (English):	Amp 1 Zone 1
Master:	0
Station group list:	
Page amp station:	10000
...	
Station ID:	10010 (entered when creating the station)
Name (English):	Amp 1 Zone 10
Master:	0
Station group list:	
Page amp station:	10000

### 4.2.3 Page Zone setup:

To define the page zones (combinations of relays to activate with the amplifier), you need to perform the following steps for each page zone

From the Administration menus, select “Edit/Modify Software”, then select the “PageZone” database. Create a new page zone using the F10 key. The pagezone database will appear as shown on the right.

```

↓ / Enter: Next Field.          ↑: Previous field.          Home: Next Page
← / →: Select                  PgUp/PgDn: Next/previous entry  End: Quit
                                F9:Delete   F10:Add           F1: Help

Pagezone ID:      1
Name (English):   Zone 1
Name (French):    ?
Name (Spanish):   ?
Volume:          6
Music channel:    0
Call priority:    0
Masters in zone:
Stations in zone: 10000-10001
Call announce:    1
    
```

Change the following settings:

- Pagezone ID:            Pagezone number of Page Zone (entered when creating the page zone)
- Name (English):        Enter a description for this output
- Volume:                Enter the same value as the AOB “Initial Volume” setting
- Stations in zone:      Enter station number of AOB output (PageAmp station) and station numbers of DIO relay stations (Page stations) to turn on when calling this zone.
- Call announce:         1 (for call announce tone) or 0 (for no call announce tone)

In this example, zone 1-10 will be separate page zones, and zone 99 will be an all page.

- Pagezone ID:            1
- Name (English):        Zone 1
- Volume:                6
- Stations in zone:      10000-10001
- Call announce:         1

...

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Pagezone ID: 10  
Name (English): Zone 10  
Volume: 6  
Stations in zone: 10000,10010  
Call announce: 1

Pagezone ID: 99  
Name (English): All Zones  
Volume: 6  
Stations in zone: 10000-10010  
Call announce: 1