



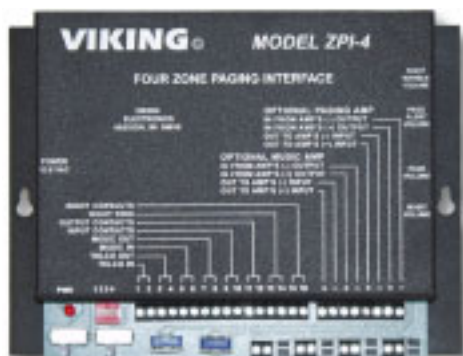
# TECHNICAL Practice

**TELECOM SOLUTIONS FOR THE 21ST CENTURY**

## ZPI-4 Four Zone Paging Interface

August 16, 2002

### Four Zone Paging Interface



The **ZPI-4** is a four-zone Touch Tone controlled paging system capable of switching a line level signal (600 ohms) to amplifiers, 70V signal to speakers or an amplified signal (200 watts maximum into 8 ohms) to speakers.

The **ZPI-4** features balanced audio circuitry throughout for low noise and compatibility with balanced paging system inputs and outputs. There are separate level controls for paging and background music, and background music can be disabled on a per-zone basis. Also provided is a night bell with adjustable volume activated by a dry contact closure, a ringing C.O. or a ringing analog PABX/KSU station.

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The **ZPI-4** is compatible with ringing C.O. lines, Centrex lines and analog PABX/KSU station ports (disconnects on silence, CPC, busy or time-out) as well as unused trunk inputs, and will interface directly with standard paging ports.

### Features

- Touch Tone control of four zones, expandable to 8 zones
- Switches line level signal to amplifiers or amplified signal to speakers (amplifier(s) not included)
- Balanced audio circuitry for low noise
- Night bell warble with adjustable level from contact closure or ringing analog line
- Input provided for background music
- Separate paging and background music level adjustments
- Background music automatically mutes in paged zone(s) in all but single amplifier mode
- All-call and five group call patterns, selected by Touch Tones
- Adjustable page alert tone level
- Interfaces with ringing C.O. lines, Centrex lines, and analog station ports, paging ports and unused phone system trunk ports
- Disconnects on silence, CPC, busy or time-out
- Screw terminals for all input/output connections
- Compatible with Viking's **FBI-1A** Anti-Feedback Paging Interface (**Fax Back Document 465**)

### Applications

- Multiple zone paging for Centrex systems
- Multiple zone paging for phone systems with paging ports, unused analog station ports or unused trunk inputs
- Multiple department manufacturing business
- Multilevel warehouse
- Multi building office complex

Phone... 715.386.8861

[info@vikingelectronics.com](mailto:info@vikingelectronics.com)

<http://www.vikingelectronics.com>

### Specifications

**Power:** 120V AC/13.8V AC, 1.25A adapter provided  
**Dimensions:** 211mm x 160mm x 46mm (8.30" x 6.30" x 1.80")  
**Shipping Weight:** 1.5 kg (3.2 lbs)  
**Environmental:** 0° C to 32° C (32° F to 90° F) with 5% to 95% non-condensing humidity  
**Relay Contacts:** 5 Amps@30V DC/250V AC each (200w@8Ω)  
**REN:** 0.5 A  
**Artificial Talk Battery Voltage:** 24V DC  
**Connections:** (32) cage clamp screw terminals

# Installation and Programming

**IMPORTANT:** Electronic devices are susceptible to lightning and power station electrical surges from both the AC outlet and the telephone line. It is recommended that a surge protector be installed to protect against such surges. Contact Panamax at (800) 472-5555 or Electronic Specialists Inc. at (800) 225-4876.

Diagram 1

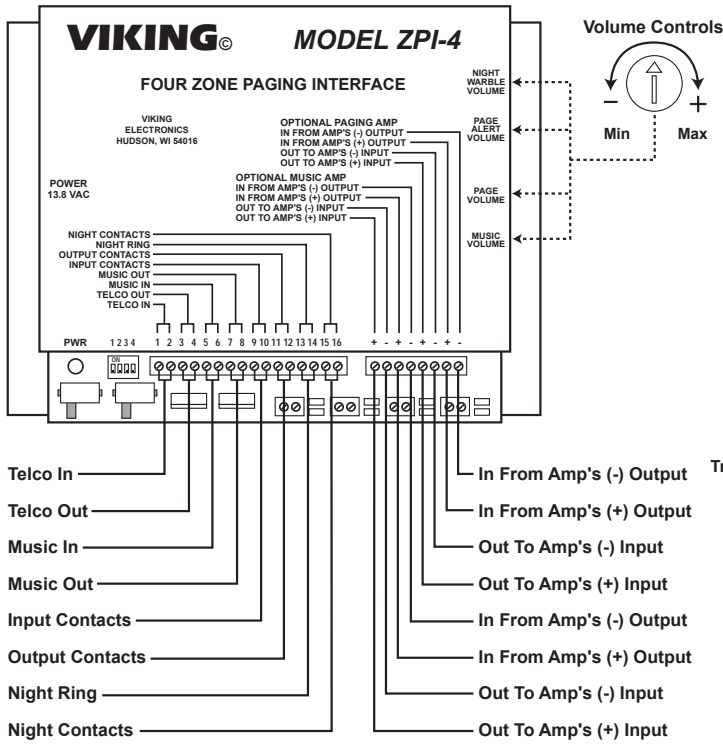
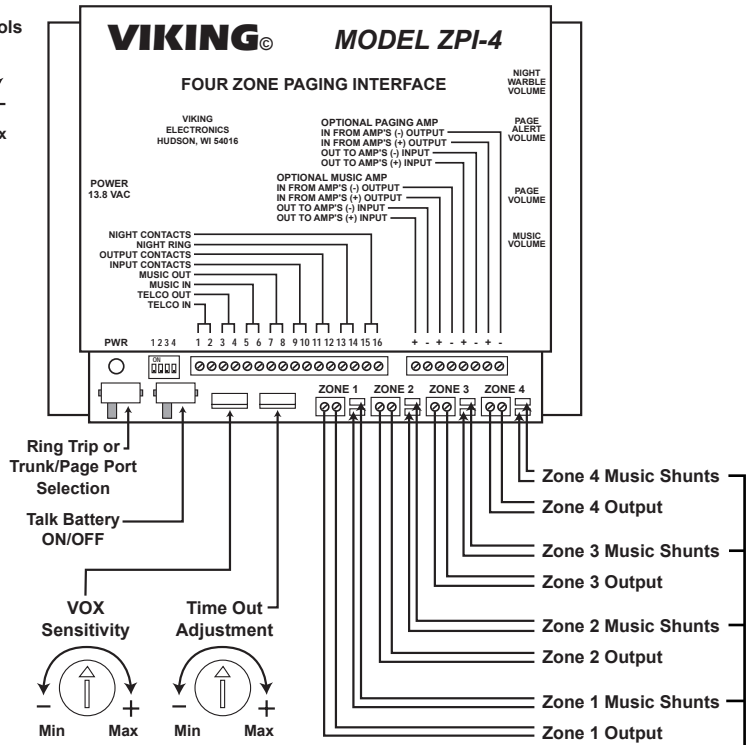


Diagram 2



**Note:** Remove these shunts to eliminate background music for each zone individually.

Diagram 3

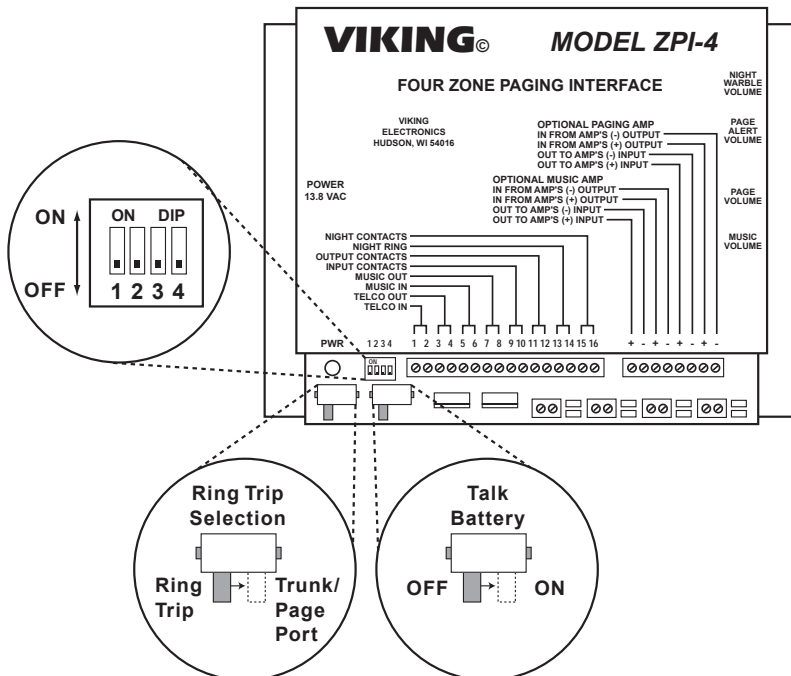


Diagram 4 (see Diagram 3)

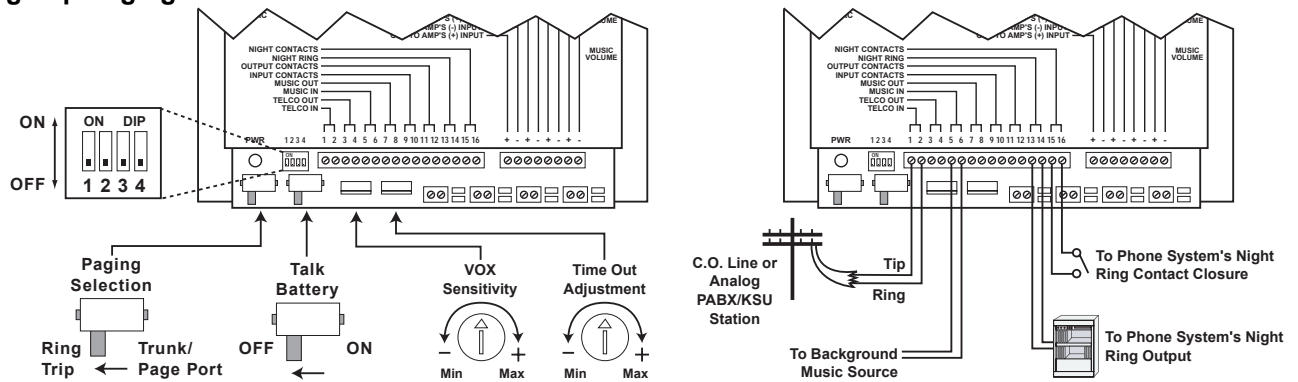
Switch	ON/OFF	Description
1	ON	Single amplifier
	OFF	Two or more amplifiers
2	ON	Two units
	OFF	Single unit
3	ON	Slave unit
	OFF	Master unit
4	ON	Dial tone enabled
	OFF	Dial tone disabled

**Note:** DIP switches should be set prior to powering up the ZPI-4. If power has already been applied, momentarily power down the unit so the switches will take effect.

# A. System Interface

## 1. Ring Trip Paging

Diagram 5

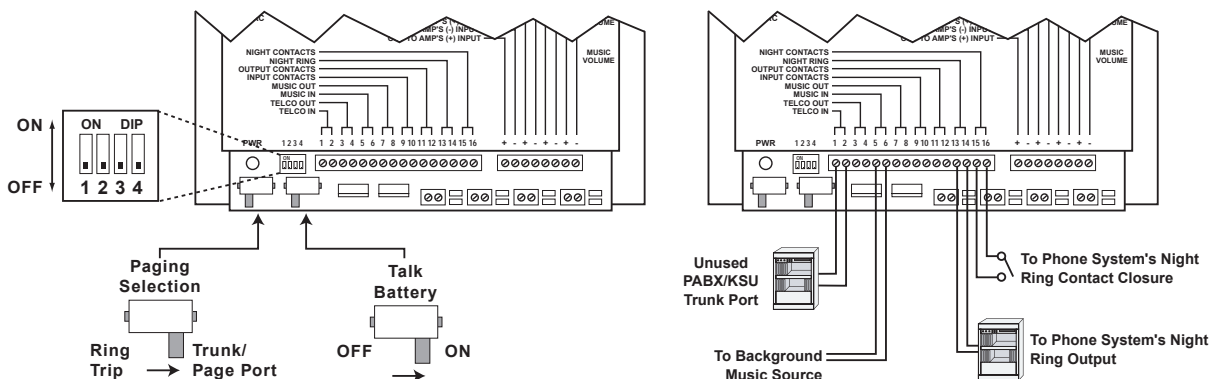


<b>Step 1.</b>	Set the <b>RING TRIP/TRUNK/PAGE PORT</b> switch to the <b>RING TRIP</b> position (all the way to the left).
<b>Step 2.</b>	Set the <b>TALK BATT</b> switch to the <b>OFF</b> position (all the way to the left).
<b>Step 3.</b>	Attach <b>TIP</b> and <b>RING</b> to the <b>TELCO IN</b> screw terminals.
<b>Step 4.</b>	Attach the background music source, if used, to the <b>MUSIC IN</b> screw terminals.
<b>Step 5.</b>	Adjust the <b>TIME OUT ADJUST</b> as required (adjustable from approximately 5 seconds to 80 seconds). This should be set to a second or two longer than the longest expected page. The <b>ZPI-4</b> hangs up when this timer is up, and if the timer is set for too short a time, the <b>ZPI-4</b> will hang up in the middle of a page.  <i>Notes: The VOX SENSITIVITY probably will not have to be adjusted unless the ZPI-4 is disconnecting in the middle of a page, before the time out or there is a period of silence during a page longer than three seconds and the ZPI-4 does not auto-disconnect.</i>  <i>To adjust the VOX SENSITIVITY, turn the POT counter clockwise to decrease the VOX sensitivity and clockwise to increase it. The VOX SENSITIVITY should be increased if the ZPI-4 is auto-disconnecting in the middle of pages, and decreased if it is not auto-disconnecting on busy signals or periods of silence more than three seconds.</i>
<b>Step 6.</b>	If the phone system provides a contact closure for night ring, connect a pair of wires from this closure to the <b>NIGHT CONTACTS</b> screw terminals. If the phone system provides ring signal for night ring, hook up a pair of wires from the phone system night ring output to the <b>NIGHT RING</b> screw terminals.
<b>Step 7.</b>	Select dial tone if desired by putting DIP switch 4 to <b>ON</b> , otherwise turn it <b>OFF</b> .

## 2. Paging from an Unused Phone System Trunk Input

**Note:** In this mode, the **ZPI-4's** time out and **VOX** sensitivity are disabled. The **ZPI-4** will release the trunk as soon as the paging party hangs up.

Diagram 6

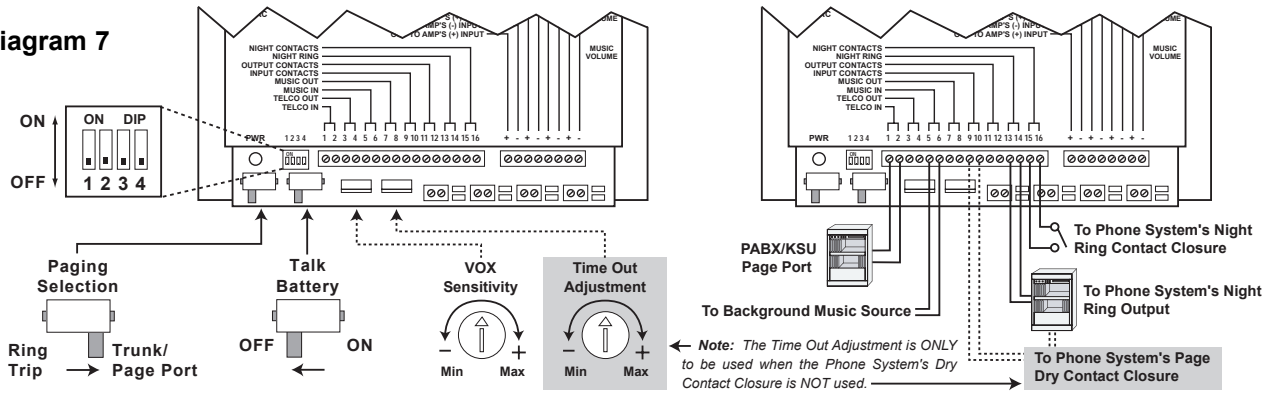


<b>Step 1.</b>	Set the <b>RING TRIP/TRUNK/PAGE PORT</b> switch to the <b>TRUNK/PAGE PORT</b> position (all the way to the right).
<b>Step 2.</b>	Set the <b>TALK BATT</b> switch to the <b>ON</b> position (all the way to the right).
<b>Step 3.</b>	Attach <b>TIP</b> and <b>RING</b> to the <b>TELCO IN</b> screw terminals.
<b>Step 4.</b>	Attach the background music source, if required, to the <b>MUSIC IN</b> screw terminals.
<b>Step 5.</b>	If the phone system provides a contact closure for night ring, connect a pair of wires from this closure to the <b>NIGHT CONTACTS</b> screw terminals. If the phone system provides ring signal for night ring, hook up a pair of wires from the phone system night ring output to the <b>NIGHT RING</b> screw terminals.
<b>Step 6.</b>	Dial tone may be enabled as shown in <b>Diagram 4</b> .

### 3. Paging from a Phone System's 600 Ohm Paging Port

**Note:** You must be able to send Touch Tones through the PABX's paging port for this mode to work.

**Diagram 7**



<b>Step 1.</b>	Set the <b>RING TRIP/TRUNK/PAGE PORT</b> switch to the <b>TRUNK/PAGE PORT</b> position (all the way to the right).
<b>Step 2.</b>	Set the <b>TALK BATT</b> switch to the <b>OFF</b> position (all the way to the left).
<b>Step 3.</b>	Attach a pair of wires from the paging port to the <b>TELCO IN</b> screw terminals.
<b>Step 4.</b>	Attach the background music source, if required, to the <b>MUSIC IN</b> screw terminals.
<b>Step 5a.</b>	If the phone system provides a page dry contact closure for paging, connect a pair of wires from this closure to the <b>INPUT CONTACTS</b> screw terminals of the <b>ZPI-4</b> . In this application, the <b>ZPI-4</b> 's time out and VOX sensitivity are disabled. The <b>ZPI-4</b> will release the page port as soon as its <b>INPUT CONTACTS</b> open.
<b>Step 5b.</b>	If the phone system does not provide a page dry contact closure, adjust the <b>TIME OUT ADJUST</b> as required (adjustable from approximately 5 seconds to 80 seconds). This should be set to a second or two longer than the longest expected page. The <b>ZPI-4</b> hangs up when this time is reached, and if the timer is set too short, the <b>ZPI-4</b> will hang up in the middle of a page.  <b>Notes:</b> The <b>VOX SENSITIVITY</b> probably will not have to be adjusted unless the <b>ZPI-4</b> is disconnecting in the middle of a page, before the time out or there is a period of silence during a page longer than three seconds and the <b>ZPI-4</b> does not auto-disconnect.  To adjust the <b>VOX SENSITIVITY</b> , turn the <b>POT</b> counter clockwise to decrease the <b>VOX</b> sensitivity and clockwise to increase it. The <b>VOX SENSITIVITY</b> should be increased if the <b>ZPI-4</b> is auto-disconnecting in the middle of pages, and decreased if it is not auto-disconnecting on periods of silence longer than three seconds.
<b>Step 6.</b>	If the phone system provides a contact closure for night ring, connect a pair of wires from this closure to the <b>NIGHT CONTACTS</b> screw terminals. If the phone system provides ring signal for night ring, connect a pair of wires from the phone system night ring output to the <b>NIGHT RING</b> screw terminals.
<b>Step 7.</b>	Put DIP switch 4 to <b>OFF</b> to disable the <b>ZPI-4</b> 's dial tone.

## B. Amplifier Configuration

### 1. Four Amplifier Mode

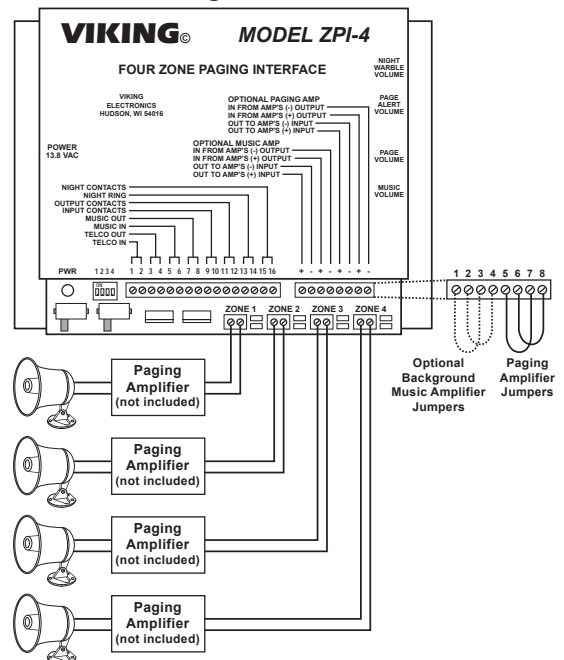
In this mode, each paging zone has its own amplifier, and the function of the **ZPI-4** is to switch the unamplified paging or background music signal to the appropriate amplifier.

**Advantages:** There is no amplifier power limitation, zones can be set to different volumes, background music is selectable per zone and the non-paged zones will continue to get music during a page.

To set the **ZPI-4** up in the four amplifier mode:

<b>Step 1.</b>	Attach the <b>ZONE 1</b> screw terminals to the input of the amplifier for Zone 1.
<b>Step 2.</b>	If background music is to be enabled on this zone, ensure that the <b>ZONE 1</b> music shunts are in place, covering both pins. If not, remove the shunts.
<b>Step 3.</b>	Repeat steps 1 and 2 for each of the remaining three zones.
<b>Step 4.</b>	Install the included jumpers across the Optional Paging Amp screw terminals.
<b>Step 5.</b>	If a background music source is being used, install the Optional Background Music Amplifier jumpers as shown.
<b>Step 6.</b>	Set DIP switch 1 to <b>OFF</b> .
<b>Step 7.</b>	Connect Paging Amps between zone outputs and speakers.

**Diagram 8**



## 2. Two Amplifier Mode (Paging and Music)

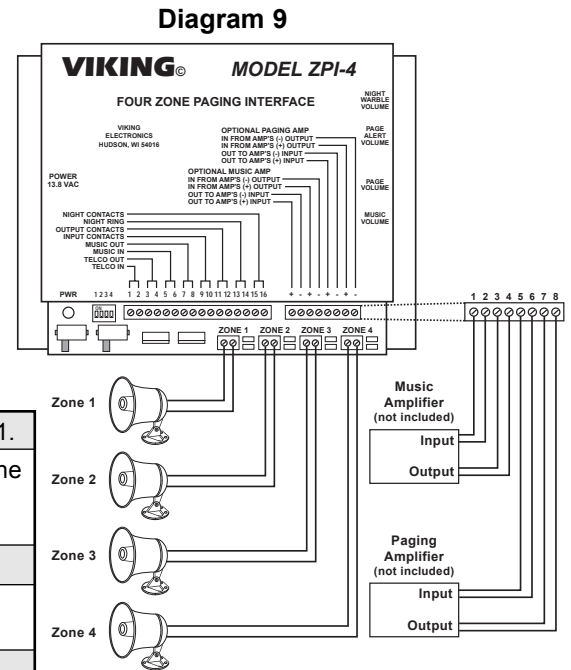
In the two amplifier mode, one amp serves as the paging amplifier and the other as the background music amplifier. The paging or music signal is sent to the external amplifier, returned and the amplified signal is switched by the **ZPI-4** to the correct zone or zones.

**Advantages:** Any size amplifier may be used when driving 70V speakers, only (2) amplifiers (or one stereo amp) are required for 4 zones, background music is selectable per zone, and the non-paged zones will continue to get music during a page.

**Limitations:** The paging amp needs to be limited to 200 watts and the music amp needs to be limited to 70 watts when switching 8 ohm speaker loads, each speaker zone is limited to 8 ohms minimum impedance and the amp must have the ability to drive the speakers of all zones. (Example: 4 zones at 8 ohms per zone equals a 2 ohm load during an all call.)

To set up the **ZPI-4** in the two amplifier mode:

<b>Step 1.</b>	Attach the ZONE 1 screw terminals to the speaker(s) for Zone 1.
<b>Step 2.</b>	If background music is to be enabled on this zone, ensure that the ZONE 1 music shunts are in place, covering both pins. If background music is not desired, remove the shunts.
<b>Step 3.</b>	Repeat steps 1 and 2 for each of the remaining three zones.
<b>Step 4.</b>	Attach the paging amplifier and the music amplifier as shown in the diagram.
<b>Step 5.</b>	Set DIP switch 1 to OFF.



## 3. Single Amplifier Mode

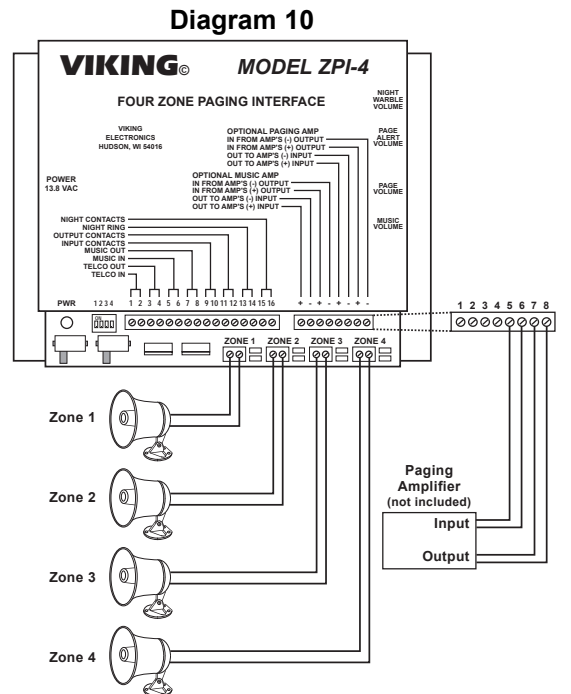
In this mode, one external amplifier handles both paging and background music. An internal relay capable of switching between paging signal and music signal sends input to this amp, the amplified signal is returned and the **ZPI-4** sends it to the correct zone(s).

**Advantages:** Any size amplifier may be used when driving 70V speakers, only one amplifier is required.

**Limitations:** The amplifier needs to be limited to 200 watts, each speaker zone is limited to an 8 ohm minimum impedance, the amplifier must be able to drive the speakers of all zones (Example: 4 zones at 8 ohms per zone equals a 2 ohm load during an all call); if background music is used, all zones will receive background music and it will be muted in all zones during a page.

To set up the **ZPI-4** in the single amplifier mode:

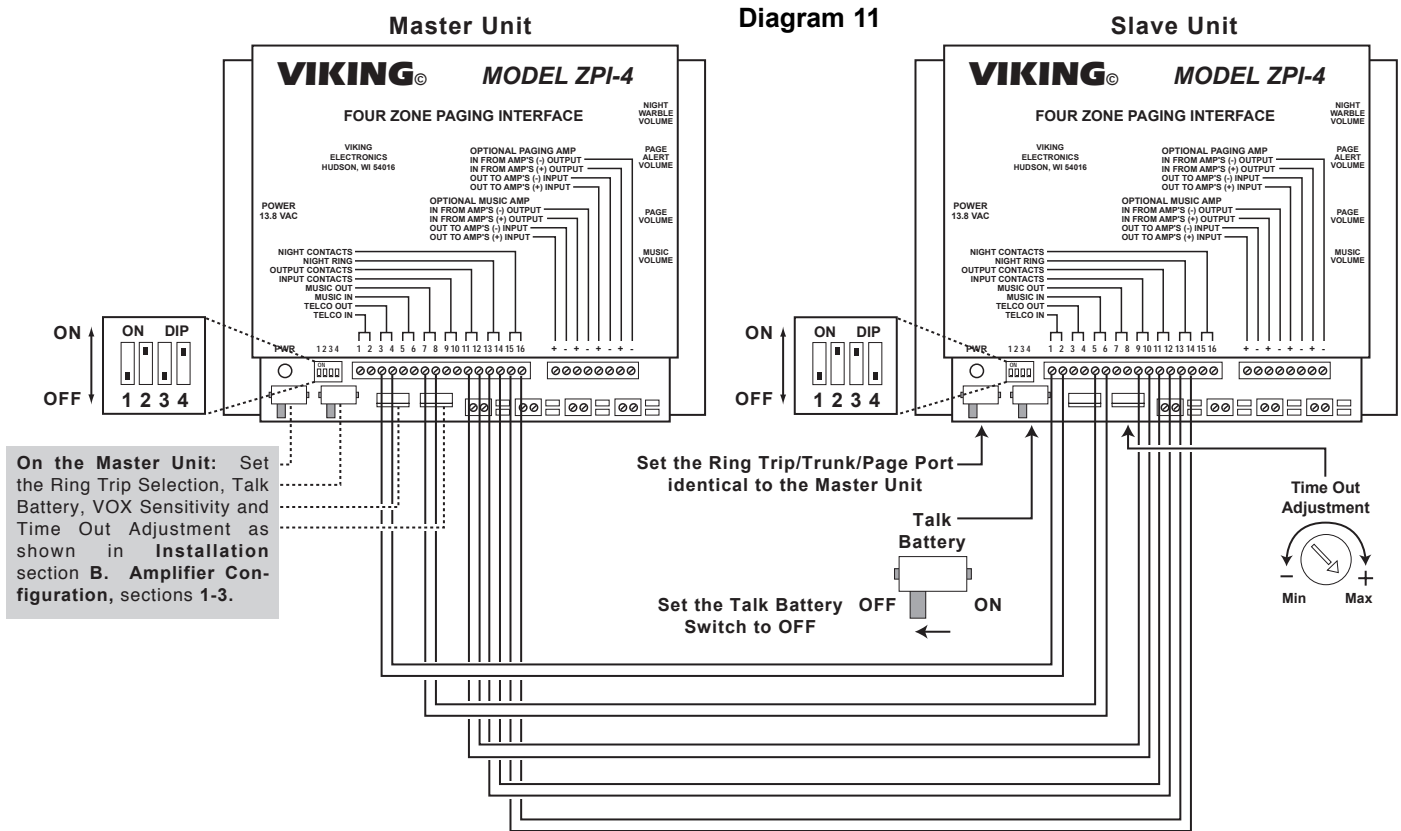
<b>Step 1.</b>	Attach ZONE 1 screw terminals to the speaker(s) for Zone 1.
<b>Step 2.</b>	Repeat step 2 for each of the remaining three zones.
<b>Step 3.</b>	Attach the paging amp as shown in the diagram.
<b>Step 4.</b>	If a background music source is being used, install the Optional Background Music Amplifier jumpers as shown..
<b>Step 5.</b>	Set DIP switch 1 to the ON position. This tells the <b>ZPI-4</b> that it is operating in the single amplifier mode.



**Important:** If a background music amplifier is not installed and background music is required, install the Optional Background Music jumpers as shown above.

## C. Multiple Units

While the **ZPI-4** is a four zone paging unit, it may be cascaded with an additional **ZPI-4** for a total of up to eight paging zones. The first **ZPI-4** is considered the “Master” unit, and the other unit is considered a “Slave”.



<b>Step 1.</b>	Install the Master unit as explained in section <b>A. System Interface</b> .
<b>Step 2.</b>	Select an amplifier mode, shown in <b>Installation</b> section <b>B. Amplifier Configuration</b> , sections 1-3.
<b>Step 3.</b>	Set DIP switch 2 to <b>ON</b> for both the Master and Slave. This sets both <b>ZPI-4s</b> for multiple units.
<b>Step 4.</b>	On the Slave unit, set DIP switch 3 to <b>ON</b> . On the Master unit, leave <b>OFF</b> .
<b>Step 5.</b>	If dial tone is desired, set DIP switch 4 on the Master unit to <b>ON</b> . This will enable dial tone for both units. On the Slave unit, DIP switch 4 should remain <b>OFF</b> .
<b>Step 6.</b>	On the Slave unit, set the <b>RING TRIP/TRUNK/PAGE PORT</b> switch to the same as the Master.
<b>Step 7.</b>	On the Slave unit, set the <b>TALK BATTERY</b> switch to <b>OFF</b> .
<b>Step 8.</b>	Connect a pair of wires from the <b>TELCO OUT</b> of the Master to the <b>TELCO IN</b> of the Slave.
<b>Step 9.</b>	Connect a pair of wires from the <b>MUSIC OUT</b> of the Master to the <b>MUSIC IN</b> of the Slave.
<b>Step 10.</b>	Connect a pair of wires from the <b>OUTPUT CONTACTS</b> of the Master to the <b>INPUT CONTACTS</b> of the Slave.
<b>Step 11.</b>	If night warble is desired through the Slave’s zones, connect a pair of wires from the <b>NIGHT RING</b> or <b>NIGHT CONTACTS</b> (depending on which application you are using) of the Master to the <b>NIGHT RING</b> or <b>NIGHT CONTACTS</b> of the Slave.  <i>Note: In the Trunk/Page Port mode, the Slave’s night warble volume should be set to minimum (fully counter-clock wise). The Master’s night warble volume will control the Slave’s zones. In Ring Trip mode, the Master and Slave’s night warble volumes will work independently.</i>
<b>Step 12.</b>	Set the <b>TIME OUT ADJUSTMENT</b> on the Slave to the maximum time (clockwise).
<b>Step 13.</b>	Plug the power supply adapter into the power jack of the Slave, and the other end into a wall outlet.

# Operation

## A. Initiating a Page

### 1. Ring Trip Paging

To access the **ZPI-4** for ring trip paging, call the C.O., Centrex number or PABX/KSU station number the **ZPI-4** is connected to. The **ZPI-4** will answer on the first ring, produce dial tone (if enabled) and await Touch Tone entry for 10 seconds. If there is a Touch Tone entry, the **ZPI-4** activates the selected zone(s). If there is no Touch Tone entry in 10 seconds, the **ZPI-4** disconnects.

### 2. Paging from an Unused Phone System Trunk Input

To make a page with the **ZPI-4** installed on a spare trunk port, simply access the trunk connected to the **ZPI-4**. The **ZPI-4** will produce dial tone (if enabled), wait for Touch Tone entry, and activate the selected zone(s) when it sees a Touch Tone entry.

### 3. Paging from a Phone System's 600 Ohm Paging Port

To page in this situation, access the phone system's paging port. The **ZPI-4** will detect that a page is being initiated and wait for a Touch Tone entry. When it sees an entry, it activates the selected zone(s).

## B. Selecting Zones

### 1. Selecting Zones with One ZPI-4

Enter a single Touch Tone to select the zone or zones to be paged. After this entry has been made, the **ZPI-4** activates the selected zone(s). See diagram to the right.

Touch Tone	Zone(s)
1	1
2	2
3	3
4	4
5	1+2
6	2+3
7	3+4
8	1+2+3
9	2+3+4
0	1+2+3+4 (All)

### 2. Selecting Zones with Multiple ZPI-4's

To page all zones, enter a Touch Tone "0". The **ZPI-4** will activate all zones to which it is connected. Otherwise, enter two Touch Tones, with the first selecting which **ZPI-4** is being addressed, and the second selecting which zones connected to that **ZPI-4** are to be paged. If a Touch Tone "1" is entered as the first digit, the Master is selected. If a Touch Tone "2" is entered as the first digit, the Slave is selected. See diagrams to the right.

Touch Tone	Unit	Zone(s)
0	All	All

Touch Tone	Unit	Zone(s)	Touch Tone	Unit	Zone(s)
11	1	1	21	2	1
12	1	2	22	2	2
13	1	3	23	2	3
14	1	4	24	2	4
15	1	1+2	25	2	1+2
16	1	2+3	26	2	2+3
17	1	3+4	27	2	3+4
18	1	1+2+3	28	2	1+2+3
19	1	2+3+4	29	2	2+3+4
10	1	1+2+3+4	20	2	1+2+3+4

## C. Paging

After there has been a Touch Tone entry, the **ZPI-4** activates the selected zones and produces a paging alert tone. At this point the page can be spoken into the handset of the phone. In a **RING TRIP** or **PAGING PORT WITHOUT CONTACT CLOSURE** application, it is necessary to keep in mind that there is a time limit on the page, set by the **TIME OUT ADJUSTMENT**. Also, in these two applications, the VOX voice detect circuit will disconnect the page if three seconds of silence elapse during the page. When finished paging, simply hang up.

# Applications

## A. PA-2A Paging Amplifier and Loud Ringer



? Need More Information on the PA-2A?  
Call (715) 386-4345 and select 485.

The **PA-2A** provides loud ringing and paging to electronic key systems, 1A2 Key systems, PABX's as well as No-KSU phones and multiline phones.

Paging is accomplished by connecting the **PA-2A** to a paging port or unused C.O. line input of nearly any phone system.

The **PA-2A** will also generate an adjustable loud warble from up to 6 C.O. lines or from a dry contact closure. An external "night transfer" switch can be added to turn loud ringing on or off in night bell applications.

The **PA-2A** is easy to install and eliminates the installation of multiple bells, relays and paging cards. The unit comes complete with a power supply, amplifier and (1) paging horn.

## B. M15W Paging Power Amplifier

The **M15W** is designed to add more paging power to almost any amplified paging product, or it may be used as a primary paging amplifier.



Audio can be input from a 600 ohm source or from an 8-ohm amplified source. The 15 watt output can drive an eight to four ohm load, or two separate two-ohm loads, which simplifies installation of up to eight 8-ohm speakers. Installation of up to 32 speakers is possible. A power adapter and one **25AE** Paging Horn are included.

**Note:** The **M15W** is **NOT** compatible with talkback paging products such as Viking's **HF-2WC** and **HF-3W**.

? Need More Information on the 25AE?  
Call (715) 386-4345 and select 498.



? Need More Information on the M15W?  
Call (715) 386-4345 and select 481.

## C. CPA-7B General Purpose Telecom Paging System



? Need More Information on the CPA-7B?  
Call (715) 386-4345 and select 455.

The **CPA-7B** is a cost effective, multi-purpose, telecom paging system.

The **CPA-7B** features a low noise, high fidelity amplifier, providing 6 watts of power for a variety of telecom paging applications. It can also provide background music and night bell/common audible. In addition, multiple units may be daisy-chained for larger paging applications.

Compatible with ringing C.O. lines, Centrex lines and analog PABX/KSU station ports as well as unused trunk inputs, the **CPA-7B** will also interface directly with standard paging ports. The **CPA-7B** is easy to install and can eliminate the installation of multiple bells, relays and paging cards.



For loud ringing, the **CPA-7B** generates an adjustable loud warble from a dry contact closure, a ringing C.O. or a ringing analog PABX/KSU station.

? Need More Information on the 25AE?  
Call (715) 386-4345 and select 498.

Product Support Line...715.386.8666

Fax Back Line...715.386.4345

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