



ZX135

Installation Manual

Release 1.2
Software: 1.xx

APRIL 03

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1.0 OVERVIEW:

The ZX135 is a stereo Zone Mixer designed to route one Microphone input and three stereo source inputs to any of 5 mono output channels that can be configured also as stereo pairs. The ZX135 can be expanded to provide up to 23 output channels through the addition of expander units, each of 6 outputs. The expander units communicate with and are programmed through the ZX135 master unit.

The ZX135 system combines digital control with analogue circuitry to provide a highly versatile and intuitive unit offering the installer the ability to define all parameters - Routing, EQ, Levels, Priority ducking and Phantom Power - from the front panel without the need for internal configuration. This technology also gives complete security over the controls via a software lock, and up to three levels of user control. Provision is also made for connection to a security circuit such as a fire alarm system for automatic music muting and announcement purposes.

A unique feature of the ZX135 is the ability to adapt EQ according to the output volume. This gives the installer the ability to define more bass rich EQ for low levels with less accentuation at high levels. The system modifies the EQ for all volume settings in-between.

Zones can be remotely controlled via wall box mounting remote panels available in two formats; volume control & muting only and volume control muting and source select. A Master Zone Controller can also be specified that provides a simple to operate control surface for selecting sources and controlling the volume in any zone in the building. Finally a dedicated Paging Microphone unit can be added to the system to provide paging to programmable zone groups.

All types of zone remotes operate on an RS485 bus implemented on a CAT5 network cable. This makes installation wiring extremely simple and possible in various wiring formats such as a single bus, security loop or star system. An optional RS232 interface allows programming and control via a PC or other system controllers such as Crestron or AMX.

2.0 GETTING STARTED

PLEASE READ THIS SECTION CAREFULLY.

The ZX135 has been designed to be as intuitive as possible and to facilitate extremely fast audio set-up. However familiarisation with the operating system is essential to gain the best from the system. The ZX135 has been pre-programmed at the factory to function out of the box as a general source selector and pre-amp device. For this application the unit has the following factory presets:-

Factory Presets:

- The Programming Selector switch is locked
- All Outputs are configured as MONO
- All Sources are routed to all Outputs
- Mic source and routing is configured for a standard microphone
- Mic Phantom Power is OFF
- Mic Sensitivity is set at -40dB for a dynamic microphone
- Ducking depth of the Priority Mic is set to maximum (-19dB)
- Line input 1 sensitivity is set to 0dBu, Line 2 & 3 are set to -6dBu
- Line 3 Priority is OFF
- Maximum output levels are calibrated at unity
- Minimum output level is set at -24dBu
- All EQ's are FLAT
- User Run mode is set to 4, giving user access to source select, volume and muting controls
- External override set to normally open contacts.

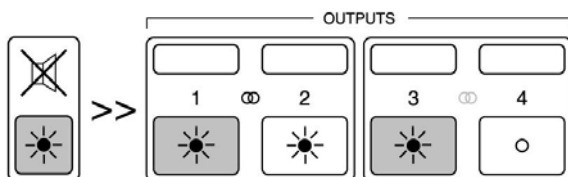
With this configuration, an ordinary source such as a CD player connected to one or more of the inputs and the outputs connected to a suitable amplifier and speaker combination, pressing the appropriate source select button will cause the source to play in all connected output zones. As the unit is in Run Mode 4, which allows user access to volume control, the volume range between the minimum level 1 and the Maximum level 10 has been set at 24dB. For safety reasons the default volume level at power on is 1. It is necessary to increase the volume in any zone by selecting the Output Select button (the Output LED comes on) and then increasing the volume towards 10 using the UP ARROW button.

A signal from a suitable microphone connected to the mic input will duck the music sources in all zones. The microphone should have an ON-OFF switch to prevent false triggering of the ducking system between announcements.

Of course it is likely that you will wish to change some or all of the preset parameters, and to do this it is necessary first to enter PROGRAMMING MODE by unlocking the keyboard.

Explanation of the button press diagrams:

Throughout the manual there are button press diagrams to illustrate programming and usage of the ZX135. A shaded button denotes a button that is pressed and released, the word 'HOLD' written underneath a shaded button denotes one that must be held down for a described period of time or while another button is pressed. A solid circle denotes an LED that is ON and a clear circle an LED that is OFF.



On the above example (Muting selected outputs) the LEDs associated with MUTE and Outputs 1, 2 and 3 are flashing, whilst Output 4 LED is off. Outputs 1 and 2 are linked as a stereo pair (stereo indicator is on), Outputs 3 and 4 are mono. The MUTE button has been pressed and released and then Output 1 and Output 3 buttons.

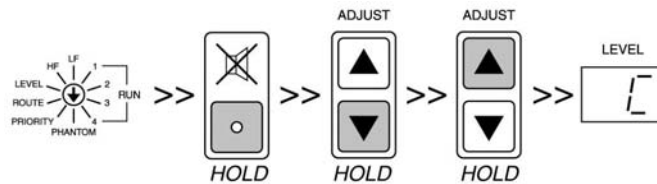
LOUD VOLUME WARNING

In programming mode with the Program Selector switch set to either PHANTOM, PRIORITY, ROUTING, LEVEL, HF and LF positions, all output levels will be at maximum. It is important therefore to make sure that the amplifiers connected to the system are turned down BEFORE entering programming mode.

2.1 UNLOCKING THE FRONT PANEL CONTROLS

To enter programming mode (un-lock the front panel controls) -

- First Select the PHANTOM position on the Programming Selector Switch.
- Press and hold MUTE
- Then press and hold the ADJUST ▼
- Then press the ADJUST ▲ buttons.
- Release all buttons when a C flashes in the numeric display.



2.2 INDEX OF PROGRAMMING PARAMETERS

Programming the ZX135 System is carried out by a combination of the position of the Programming Selector switch and the buttons on the front panel. The following parameters are set in this way and are listed in relationship to the Program Selector switch position. The position of the Program Selector switch is confirmed by the characters shown in brackets, which appear in the Numeric LED Display. It is recommended that you program the unit in a clockwise sequence of the Program Selector switch, starting from PHANTOM.

PHANTOM (+15) Apply 15V Phantom Power to the Microphone socket
Turning the Mic off
(Refer to section 3.2)

PRIORITY (P) Set ducking depth for the Mic priority
Set Priority status for Line input 3 and hold time
(Refer to section 3.3)

ROUTE (r) Define Mono and Stereo Zones
Establish input to output routings
(Refer to section 3.4)

LEVEL (L) Set Mic preamp sensitivity and level
Set Line input levels
Set maximum and minimum output levels

- Set offset volumes (balance) of stereo pairs
Set volume groups
(Refer to section 3.5)
- HF (t)** Set HF equalisation for the Mic input
Set HF equalisation for each of the outputs for both max and min levels
(Refer to section 3.6)
- LF (b)** Set LF equalisation for the Mic input
Set LF equalisation for each of the outputs for both max and min levels
(Refer to section 3.6)
- RUN 1 (1)** Lock all front panel buttons – no user access
(Refer to section 3.7 & 4.1)
- RUN 2 (2)** Allow user access to zone volume and muting.
(Refer to section 3.7 & 4.2)
- RUN 3 (3)** Allow user access to source selection only.
(Refer to section 3.7 & 4.3)
- RUN 4 (4)** Allow user access to zone volume, muting and source selection.
(Refer to section 3.7 & 4.4)

2.3 CONNECTING REMOTES

The ZX-MR1 Master Controller, ZX-R1 Volume & Mute and the ZXR2 volume & source select remotes are connected on a CAT5 network cable using RJ45 connectors and/or IDC terminal blocks. One end of the network bus is connected to the Digital Out connector on the rear of the ZX135 or ZX135 Expander.

Setting up the remotes to address a specific zone is described in Section 9.0.

2.4 LOCKING THE FRONT PANEL CONTROLS

After making any changes you should lock the programming switch to prevent inadvertent tampering with the settings. This is simply done by turning the unit off, selecting a RUN mode and switch back on again. If you do not select a RUN number the unit will default to RUN 4.

2.5 SYSTEM MEMORY

All parameter editing on the ZX135 is real time and destructive i.e. the most recent edited values are used and previous settings are overwritten. Settings do not require storing, moving to another channel to set or changing the programming selector switch will store previous alterations.

3.0 PROGRAMMING THE ZX135

Although the ZX135 has been set up to provide a measure of 'out of the box' use, many applications will require re-configuration. The method of programming the ZX135 is very simple and can be done with the unit bolted into a rack, as it requires no access to the interior of the unit. There are only a few exceptions to this, which may be required in rare instances. These are:

- Changing the microphone configuration from a standard microphone to a ZX-PM1.
- Changing the external security circuit between contacts or 24V loop detection (SEC-OR).
- Changing the external security circuit between normally open or normally closed contacts (SEC-POL).
- Making Line input 2 and/or 3 mono compatible.
- Changing the Output level from +4dBu (default) to -10dBv to enable use of HiFi amps.

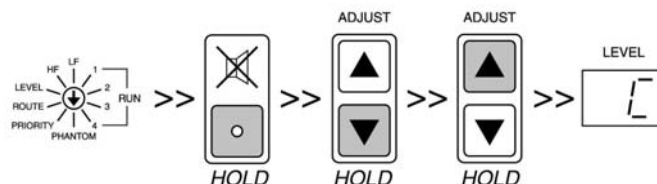
See section 8.0 - Internal Link Options for details of changing the above settings. Otherwise all configuration of the ZX135 is carried out via the Program Selector switch and the front panel buttons.

LOUD VOLUME WARNING

In programming mode with the Program Selector switch set to either PHANTOM, PRIORITY, ROUTING, LEVEL, HF and LF positions, all output levels will be at maximum. It is important therefore to make sure that the amplifiers connected to the system are turned down BEFORE entering programming mode.

3.1 UNLOCKING FRONT PANEL CONTROLS (Programming mode)

- First select the PHANTOM position on the Programming Selector Switch.
- Press and hold MUTE
- Then press and hold the ADJUST ▼
- Then the ADJUST ▲ buttons.
- Release all buttons when a C flashes in the numeric display.



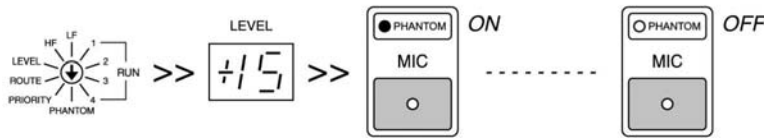
Enabling the Program Selector switch

3.2 PROGRAMMING IN THE 'PHANTOM POWER' POSITION

- Turn the Programming Selector switch to the PHANTOM position. +15 will appear in the numeric display.

Turning Phantom power on-off:

- Press and release the MIC Input select button and the PHANTOM led will illuminate.
- Press MIC again to switch Phantom power off.

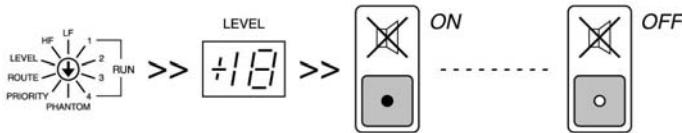


Turning phantom power on-off.

Turning the Mic off:

By default the microphone at the ZX135 input will be heard in all zones to which it is routed even if the zone is muted. If you require the Mic to be muted also, then it is necessary to turn the Mic off. To do this:

- Press the MUTE button and the MUTE led goes off.



Please note:

Even if the Mic is switched 'off' it will not affect the operation of the microphone as part of the security announcement system. In this condition the microphone will page in all zones, whether or not it is routed to them, and whether or not the zone is muted.

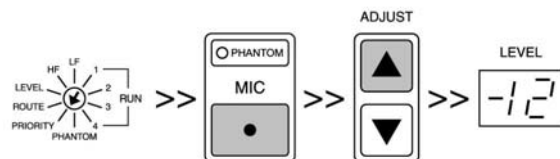
3.3 PROGRAMMING IN THE 'PRIORITY' POSITION

- Turn the Programming Selector switch to the PRIORITY position. The letter P is displayed.

Setting microphone ducking level:

The Microphone input priority causes the other sources to be 'ducked' according to the level of attenuation you set.

- Press and release the MIC button.
The numeric display now shows the ducking depth in dB.
- Use the ADJUST ▼ ▲ buttons to change the value between 0 i.e. no ducking and -19dB.



Example: Setting ducking level to -12dB.

Please note:

Microphone priority is always on.

Factory default is -19dB.

Setting the depth to 0 means the other sources will not be ducked when a mic signal is present, the mic will be mixed with the other source.

Making Line 3 a Priority input:

The Line 3 priority causes the original source to be muted and replaced with the Line 3 source, for instance to enable connection to a jukebox. The length of time taken for the original source to return after the cessation of the priority source can be changed between 0 and 19 seconds.

- Press and release the LINE 3 button. The Line 3 led lights to show priority is on.
- To turn priority off press LINE 3 button again and the associated led goes off.

Please note:

Factory preset is Line 3 priority off.

Setting Hold time:

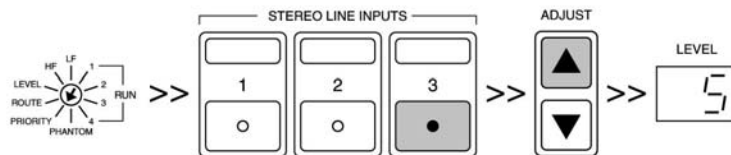
To allow time for a jukebox to change CD, for example, Line 3 priority has a hold time. This can be adjusted between 0 and 19 seconds after which the original source is re-selected.

When Line 3 priority is turned on as described above the numeric display shows the Hold time in seconds.

- Use the ADJUST ▼ ▲ buttons to change the hold time.

Please note:

Factory preset for hold time is 5 seconds.



Example: Making Line 3 a priority input and setting hold time set at 5 seconds

3.4 PROGRAMMING IN THE 'ROUTE' POSITION

- Turn the Program Selector switch to the ROUTE position. The letter r is displayed.

Defining Outputs as Stereo Zones:

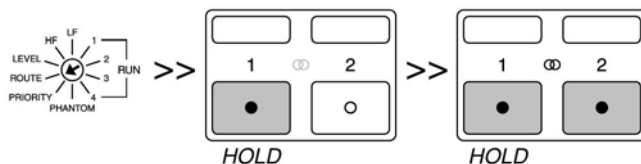
- To perform this operation there must be no input sources selected. If an input led is lit deselect the input source by pressing the relevant source select button to extinguish the led.

Please note:

The factory default defines all Outputs as mono.

- To turn a pair of mono outputs into a stereo zone, press and hold one output button e.g. OUTPUT 1 and then press the other in the pair e.g. OUTPUT 2. The Stereo led lights.

- Repeating this process will toggle the outputs between mono and stereo.



Example: Making Output 1 and 2 a stereo zone.

Please note:

Only outputs 1 & 2 and/or 3 & 4 can be stereo linked

Mono outputs will receive a mono sum signal from a stereo input.

Routing an Input Source:

- Press the Input source selector button of the source to be routed. The associated led will illuminate, along with the output leds to which the source is already routed.

Please note:

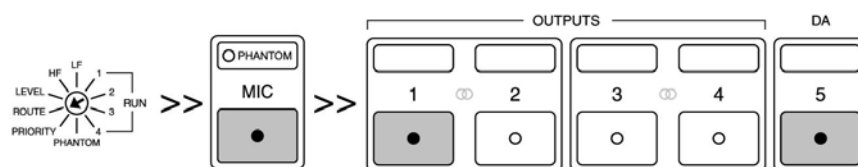
The factory default is all inputs routed to all outputs

- To route or un-route an output zone, simply press the associated Output button to illuminate (routed) or extinguish (not routed) the led.

Please note:

In the case of a stereo zone, just one of the pair of outputs need be pressed.

Once a source has been fully routed, press another source button to continue routing.



Example: Microphone routed to Outputs 1 & 5

Please note:

See section 12.0 for details on routing the ZX-PM1 paging microphone.

If using a hand held microphone it is necessary to route the mic input to any zone on which you require paging. However, it is not necessary to route to all zones for the security circuit use. This happens automatically.

Remember that the Mic Priority circuit will normally be active in muted zones to which it has been routed. If you require to disable this feature you can do so during programming - see section 3.2 'Programming in the Phantom position'.

More than one input source can be routed to an output. However, they cannot be selected at the same time. The last source selected will always take priority. The only exception to this is the Mic Input priority circuit.

3.5 PROGRAMMING IN THE 'LEVEL' POSITION

GAIN INDICATION

Gain settings for the Microphone and Line inputs are displayed as input sensitivity e.g. display shows -10 to indicate that an input signal of -10dBu will give a nominal 0dBu output.

- Turn the Programming Selector switch to the LEVEL position. The letter L will appear in the display.

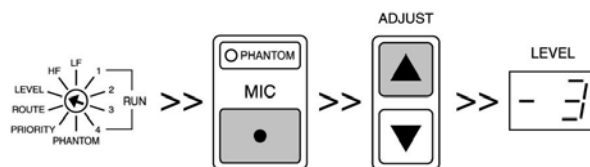
Setting Microphone input sensitivity:

The factory preset for the Mic preamp assumes a Microphone sensitivity of -50dBu (approximately 3mV) for a Dynamic microphone, and -40dBu (approximately 15mV) for a Phantom powered microphone. If the chosen microphone differs from these ranges, then it will be necessary to change the input sensitivity.

As the numeric display of the ZX135 can only show +/- 19, this is not sufficient to display the full range of the Mic Preamp (60dB). As an indication the decimal of the range is displayed. So -60dB is displayed as -6 and -20dB as -2, the decimal point signifies a 2dB step.

A Level setting of '0' gives unity gain and the Mic input will accept input levels up to +8dBu. At the maximum sensitivity setting of -6 a signal of -60dB will be amplified to 0dBu.

- First press and release the MIC input button. The MIC led will be lit.
- Use the ADJUST ▼ ▲ buttons to adjust the sensitivity according to the above display settings. The setting can be checked vocally to ensure that normal vocal levels illuminate the Yellow led on the VU meter without the CLIP led lighting.



Example: Setting Microphone sensitivity in the -30dB range.

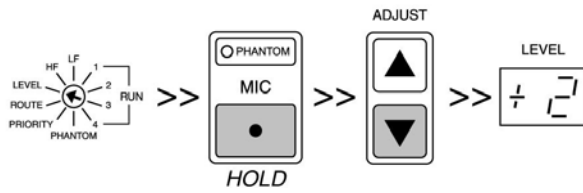
Setting Microphone level:

This function allows the microphone level to be adjusted relative to the other sources. Level range is +/-12dB and is adjusted as follows -

- Press and hold the MIC button. The numeric display shows the Level setting in dB.
- Use the ADJUST ▼ ▲ to change the level.

Please note:

Factory preset value is 0dB.



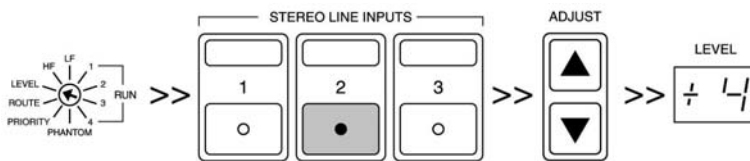
Example: Setting microphone level to +2dB

Setting Line input sensitivity:

The sensitivity of the line inputs has been factory set at 0dBu. If any of the devices connected to these inputs differ from this operating level, then it will be necessary to re-calibrate the input levels. The input amplifier can be adjusted for all levels between -19dBu and +4dBu, shown on the numeric display. For example when connecting Hi-Fi equipment with an output level of -10dBV (approximately -8dBu) set the sensitivity to -8. For professional equipment with +4dBu output set sensitivity to +4.

- Press and release the LINE source button to be adjusted and its associated led will illuminate. The current input sensitivity is displayed.
- Use the ADJUST ▼ ▲ buttons to change the level. The Yellow VU led should flash without the CLIP led lighting.

The setting is stored when you press another source select button, or change the Programming Selector switch.



Example: Setting Line input 2 sensitivity to +4dB for pro-level equipment.

Setting Maximum Output levels:

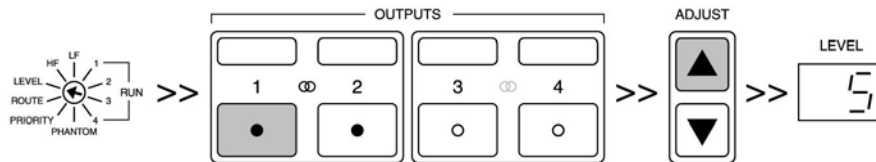
The ZX135 allows the maximum output levels to be preset by the installer to avoid any possibility of overloading the amplifiers and speakers. The factory default output levels have been set to illuminate the Yellow VU led, given a correctly calibrated source device. However for security reasons you may wish to run the amps at maximum and therefore reduce the output level from the unit.

Please note:

Reducing the output level from optimum will reduce the signal to noise performance.

In Programming mode the numeric display shows the output level in hexi decimal format - see the table on the following page.

- To set the maximum output levels, press and release the required OUTPUT button to illuminate the associated led.
- Then use the ADJUST ▼ ▲ buttons to achieve the desired level on the ZX135 VU meter or on the system amplifier meters. The system optimal level will illuminate the Yellow led at +0dBu. Take care that the CLIP led does not illuminate.



Example: Setting the maximum level for Output 1 and 2 (Stereo pair) to Hex 5 (-53dBu).

Please note:

The ZX135 provides plenty of headroom for applications requiring the connection of a live PA Mixer to Line input 1. However, be sure to leave the optimum headroom at the output by setting the maximum level to only momentarily light the Yellow led.

In Programming mode the numeric display shows the output volume in hexadecimal format which allows 64 steps of 1dB to be displayed. The following table shows the relative level setting in dB:

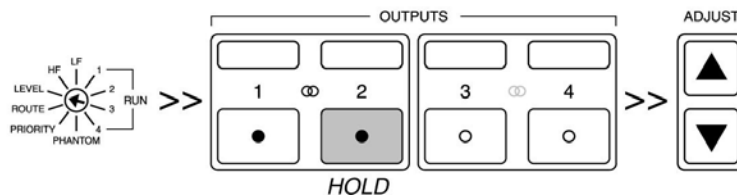
0 = -63 (min)	5. = -52	F. = -32	19. = -12
0. = -62	6. = -50	10. = -30	1A. = -10
1 = -61	7. = -48	11. = -28	1B. = -8
1. = -60	8. = -46	12. = -26	1C. = -6
2 = -59	9. = -44	13. = -24	1D. = -4
2. = -58	A. = -42	14. = -22	1E. = -2
3 = -57	B. = -40	15. = -20	1F. = 0 (max)
3. = -56	C. = -38	16. = -18	
4 = -55 etc	D. = -36	17. = -16	
4. = -54	E. = -34	18. = -14	

Volume offsets (Balance) in Stereo Pairs:

Selecting one side of a stereo pair will illuminate both outputs, and apply level adjustments evenly. However, if the levels require to be offset -

- Press and hold the relevant OUTPUT button
- Use the ADJUST ▼ ▲ buttons to set the offset.
- Release the OUTPUT button

When the switch is released, any further adjustments will be applied evenly, but with the offset in place.



Example: Adjusting the level of Output 2 relative to Output 1.

Please note:

Pressing and holding OUTPUT 1 button displays its level, similarly for OUTPUT 2. This provides a way of checking the offset between the outputs.

Setting Minimum Output level:

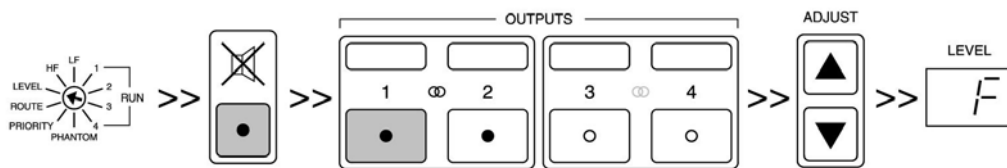
The ZX135 also allows the minimum output level to be set i.e. the user cannot ADJUST the output level below this minimum.

If you intend to activate the systems Volume Adaptive EQ feature described in section 3.6 you will first need to set up minimum listening levels.

- Press and release the MUTE button. The MUTE led lights.
- Select the required Output by pressing its associated button
- Then use the ADJUST ▼ ▲ buttons to achieve the desired minimum level.

The output level is displayed in hexadecimal as described in 'Setting maximum output levels' above.

- Press MUTE to return to normal output level



Example: Setting minimum level for output 1 & 2 (Stereo pair) to Hex F (-33dB).

Setting up Mute and Volume Groups:

It may be desirable to link outputs together for master volume control in user RUN modes 2 & 4.

- Deselect all Inputs and Outputs
- Use the ADJUST ▲ button to select Group number 1, shown on the numeric display.

'L' in the numeric display assumes normal operation i.e. no groups.

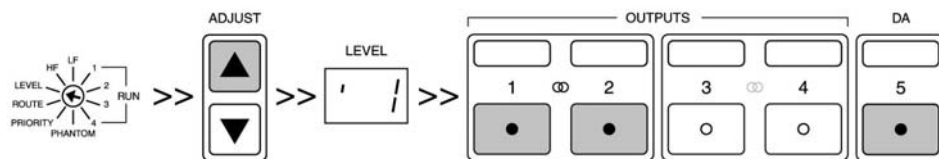
- Press the OUTPUT buttons to be grouped. The associated leds will illuminate.

They may be de-selected from the group by pressing the OUTPUT buttons again.

Now in RUN mode 2 & 4, when any OUTPUT button in the group is pressed, the other leds will also illuminate and volume changes will be applied to all areas.

To make another Volume Group:

- Use the ADJUST ▲ button to select group number 2.
- Press the OUTPUT buttons to be grouped.



Example: Outputs 1, 2 and 5 assigned to Volume Group #1.

Please note:

It is not possible for an Output to be selected into more than one group. If you try to do this any Output already in use in another Group will flash its led to show it cannot be assigned to the new group.

Using Remote Controllers with Mute & Volume Groups:

Remote Controllers ZXR1 and ZXR2 provide remote control of Mute and Volume functions. The controllers work in one of two ways -

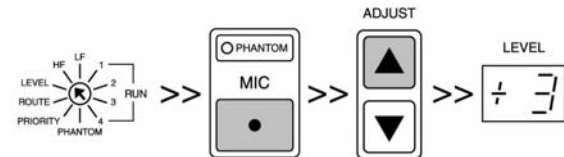
1. Where no Mute & Volume Groups are set a Remote will be dedicated to an OUTPUT channel or stereo pair. Therefore Remote #1 will control OUTPUT 1 or OUTPUT 1 & 2 if they are set up as a stereo pair.
2. With Mute & Volume Groups pre-programmed the Remotes will be assigned to a Group i.e. Remote #1 will control Mute & Volume Group #1.

For further information on using Remote Controls see section 9.0 - Remote Controls.

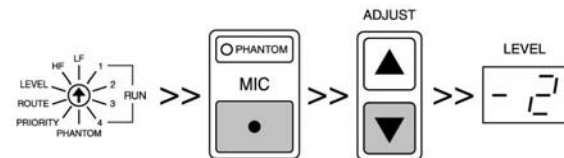
3.6 PROGRAMMING IN THE 'HF' AND 'LF' POSITIONS

The HF and LF positions are used to set the tonal balance of the Microphone input and the five Outputs. Their method of programming is similar.

- Set the Programming Selector switch in either the HF or LF positions ('t' is displayed for HF and 'b' for LF)
- Press the MIC or an OUTPUT button, the associated led lights.
- Use the ADJUST ▼ ▲ buttons to boost or cut the relevant frequency range by up to 12dB. The display shows the amount of EQ in dB e.g. +12 or -6.



Example: Setting Microphone HF EQ to +3dB.



Example: Setting Microphone LF EQ to -2dB.

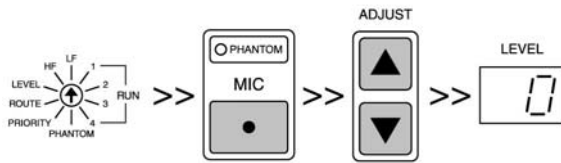
Please note:

Applying large amounts of HF and LF boost may cause signal clipping. If this occurs it will be necessary to reduce signal levels - see section 3.5.

Flattening the EQ:

To flatten EQ settings -

- Press and hold both the ADJUST ▼ ▲ buttons together. The display will show '0'.



Example: Flattening Mic LF EQ setting.

Please note:

This will also flatten all EQ's in a stereo pair.

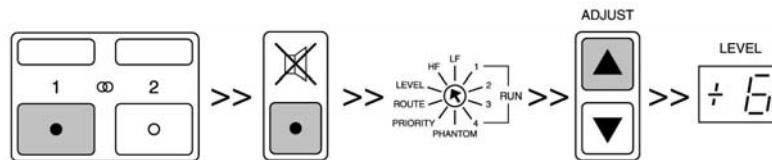
Volume Adaptive Equalisation:

Generally at low listening levels there is an apparent loss of HF and LF information and EQ is often added to compensate for this. The ZX135 has a unique feature designed to allow you to tailor the EQ to match the requirements at all listening levels. To activate this feature you will need first to have set the Minimum and Maximum output levels - see section 3.5, 'Setting Maximum/Minimum output levels'.

Following the instructions 'Programming in the HF & LF positions', described above will set the EQ for the maximum output level. These settings are automatically copied to the minimum output level. It is now possible to add boost only EQ at the minimum output level.

To set the EQ for the minimum output level -

- Press the MUTE button. This will cause the audio to change to the minimum volume as defined in the LEVEL section.
- Repeat the EQ setting as described above.



Example: Setting minimum listening level HF to +6dB for Output 1.

Please note: *It is important that the minimum volume EQ is the last to be set, as subsequent changes made to the Maximum level EQ will overwrite the Minimum volume EQ.*

3.7 SETTING THE 'RUN' MODE

Having configured the ZX135 you can now decide what level of access to give the user by setting RUN mode 1, 2, 3 or 4, which define progressive levels of user access. To preserve system integrity and to prevent damage to any equipment, even in the maximum user Run Mode 4 there is no access to the following parameters: -

- Stereo coupling
- Priority
- Phantom Power

- Input sensitivity
- Maximum and minimum output levels
- Mute & Volume groupings
- EQ settings

The access enabled by each of the Run Modes is as follows:

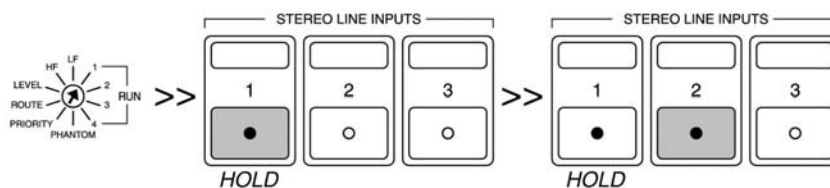
- RUN 1 (1)** Lock all front panel buttons – no user access
(Refer to section 4.1)
- RUN 2 (2)** Allow user access to zone volume and muting.
(Refer to section 4.2)
- RUN 3 (3)** Allow user access to source selection only.
(Refer to section 4.3)
- RUN 4 (4)** Allow user access to zone volume, muting and source selection.
(Refer to section 4.4)

To apply the correct level of user access, simply turn the Programming Selector Switch to the required RUN number. This will be shown in the numeric display.

Activating Source inputs for Run Modes 1 & 2:

Run modes 1 & 2 prevent any changes to source selection. You must therefore select the sources that will be ON when in use before leaving the programming mode. This can only be done with Programming Selector switch in the RUN 1 position -

- Programming Selector switch to RUN 1
- Press and hold the first INPUT source to be on, then press the other sources. The associated leds will illuminate.
- To deselect a source, press its select button again to extinguish the LED.



Example: Selecting Inputs 1 and 2 in Run mode 1.

Please note:

In these RUN modes you cannot have more than one LINE source selected to any zone. If you attempt to make a source selection that is mixed with another source, the conflict will be highlighted by the offending OUTPUT zone led flashing. This source selection will not be allowed until the routing is corrected. Return to the ROUTE position and correct the routing.

3.8 **DISABLING THE PROGRAMMING SELECTOR SWITCH**

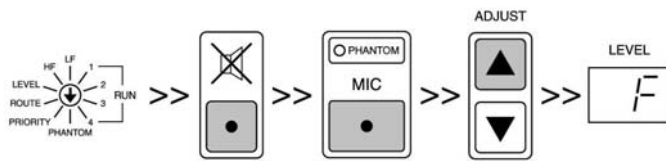
When the ZX135 is ready for use, you should disable the Programming Selector switch, which will prevent any tampering with the programmed settings.

- With the required RUN mode selected, simply turn the unit power off and back on. The RUN number is shown on the numeric display

3.9 RESTORING THE FACTORY DEFAULT SETTINGS

If the unit is being re-installed to another location it may be convenient to start from the factory presets - see section 2.0 for details.

- Programming Selector switch to Phantom Power position
- Press and hold the MUTE button
- Then press and hold the MIC button
- With the MUTE and MIC buttons held press the ADJUST ▲ button
- When an 'F' flashes in the numeric display release all of the buttons



Restoring factory default settings.

Please note:

To avoid problems with a major system reconfiguration we advise that you execute a 'Restore Factory Defaults'.

This ensures that settings such as volume offsets, Adaptive EQ, Line 3 priority and Phantom power are cancelled.

4.0 USING THE PUB MIX

The ZX135 has been designed for permanent installations where most of the settings are fixed by the installer. Because the user will have restricted or no access, the ZX135 employs some automatic routines to ensure that the resultant performance is user friendly.

For instance:- at power on, the audio will be softly ramped up over a period depending on the output level. This ramp is also employed on un-Muting and after Priority override from the Microphone and Line 3.

If the user has access to volume control (RUN 2 & 4), the volume will default to 1 (out of 10 on the numeric display) when the unit is powered on. This prevents the user suffering late night music levels early in the morning.

4.1 RUN MODE 1

The numeric display on the unit shows the figure 1 after power-up. In this mode -

- No front panel buttons are operable.
- The unit will display the Source LED's that have been selected during programming, and the Output zone LED's that have been routed.
- The unit will display any stereo link LED's that were set up.
- Line 3 with Priority selected will override the source in the zones it is routed to.
- The Microphone paging will be active in all routed zones.
- After power-on the volume will ramp up to the maximum set level.

4.2 RUN MODE 2

The numeric display on the unit shows the figure 2 after power-up. This mode is similar to Run 1 except the user has access to output volume control and muting.

Please note:

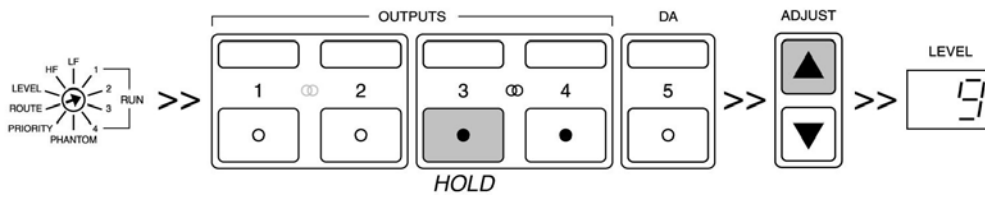
Remote type ZX-R1 is appropriate for this Run Mode (see section 9.0), although Remotes ZX-R2 and ZX-MR1 can also be used to provide Volume and Mute functions.

Changing the volume in a zone:

On power-up the output levels will default to 1 (on a scale of 10) giving a quiet background level. It is the users responsibility to increase the level.

- Press and hold the required OUTPUT button (or one channel of a stereo pair) and the volume will be shown in the numeric display. '10' indicates maximum volume and '1' minimum.
- Use the ADJUST ▼ ▲ buttons to change the volume and then release the OUTPUT button.

If a Mute & Volume Group has been established during configuration, the associated LEDs will flash while any OUTPUT select button in the group remains depressed. The volume will be adjusted simultaneously at all OUTPUTs in the Group.



Example: Increasing the volume of Output 3 and 4 (Stereo pair).

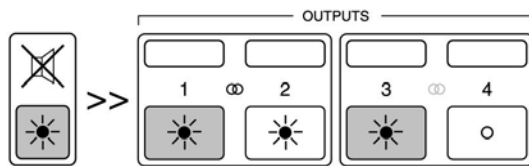
Using the Mute function:

Any zone may be muted individually, or all zones may be turned off by use of the MUTE button on the ZX135 front panel or Remote Control unit

To mute individual zones -

- Press and release the MUTE button, the MUTE led flashes.
- Then press the OUTPUT buttons (or one channel of a stereo pair) corresponding to the zones to be turned off. The associated leds will flash to show they are muted.
- Press them again to turn them on.

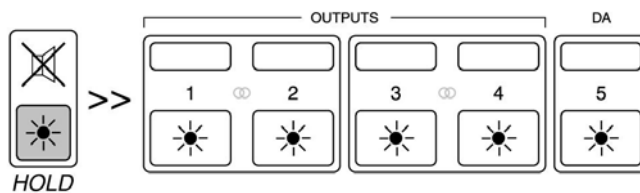
To un-mute all muted zones, press and release the MUTE button again to extinguish the MUTE led.



Example: Outputs 1 & 2 (Stereo pair) and 3 MUTED.

To mute all zones -

- press and hold the MUTE button for 1 second. All OUTPUT leds will flash to indicate they are muted.
- To un-mute all zones, press and release the MUTE button again.



Example: All zones muted.

Please note:

As a default the microphone paging function will remain active on all muted zones. This mute override may be disabled during programming - see section 3.2 'Programming in the Phantom position'.

Volume control remotes can be used in individual zones - see section 10.0.

4.3 RUN MODE 3

The unit shows the figure 3 in the numeric display after power-up. This mode is similar to Run 1 except that the user has access to source selection. On power-up the ZX135 will recall the source(s) selected when the power went off and the volume will ramp up to the preset level.

Please note:

Remote types ZX-R2 and ZX-MR1 are applicable to this Run Mode (see section 10.0) for changing source.

Selecting or changing a source:

To select or change an input source -

- Press the Source Select button and the corresponding status led will illuminate.

Although different sources can be routed to the same zone, the system will not allow two or more signals to be playing in any zone at the same time. For instance CD, Cassette and TV may be routed to the same zone, but only one of them can be played through the zone at any one time. The ZX135 will give priority to the most recent source selected.

Please note:

The source connected to the Line input 3 (with Priority enabled) will automatically override any other source routed to the same outputs. It does not require selection. However it can be selected as a permanent source in the normal way, and will remain permanently selected until another source is selected, when it will revert to it's priority status.

Use of Remote Source Select in RUN 3:

When a Remote source selector e.g. ZX-R2 or ZX-MR1 is connected to the system, it allows any routed source to play in any zone. This means that different sources can be playing in different zones.

4.4 RUN MODE 4

The unit shows the figure 4 in the numeric display after power-up and combines the functions of RUN 2 and 3, giving the user access to Volume and Source select.

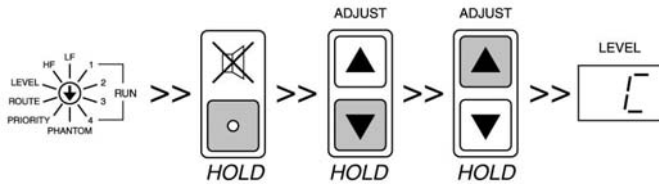
Use of Remote Source Select in RUN 4:

When a Remote source selector e.g. ZX-R2 or ZX-MR1 is connected to the system, it allows any routed source to play in any zone. This means that different sources can be playing in different zones.

Please note:

In RUN mode the Level meters display the level of the last Input or Output button pressed whether on the ZX135 or one of the Expanders.

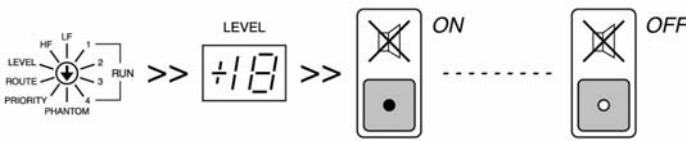
Unlocking front panel controls (programming mode) - section 3.1



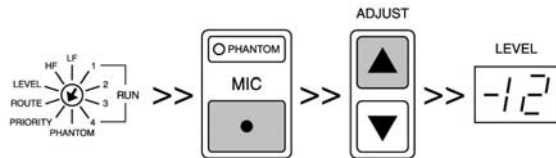
Turning Phantom power on-off - section 3.2



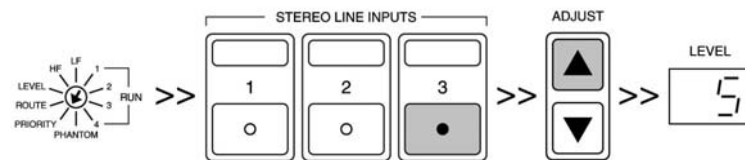
Turning Mic off - section 3.2



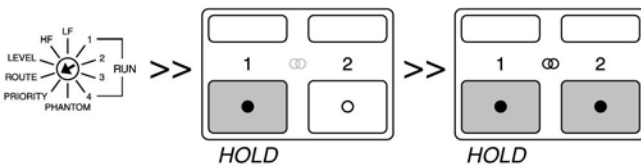
Setting Microphone priority ducking level - section 3.3



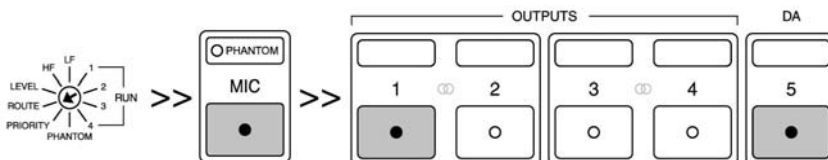
Making Line 3 a priority input and setting Hold time – section 3.3



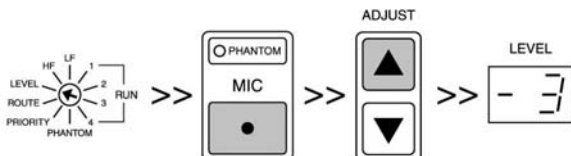
Defining stereo zones – section 3.4



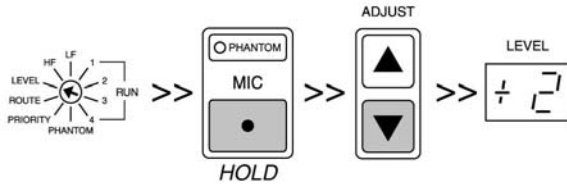
Routing an Input source – section 3.4



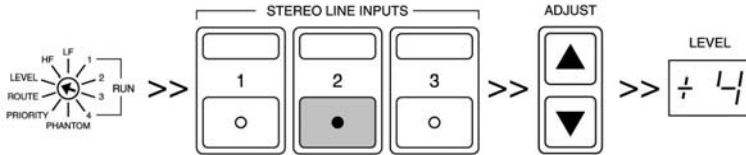
Setting microphone sensitivity – section 3.5



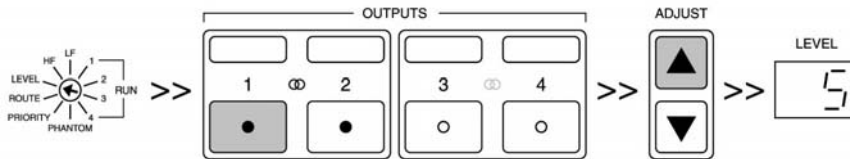
Setting microphone level – section 3.5



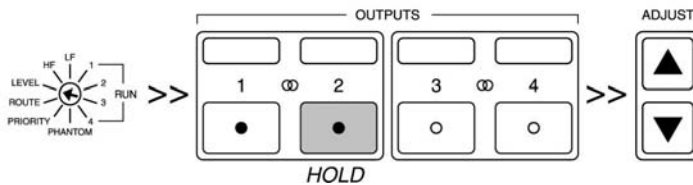
Setting Line sensitivity – section 3.5



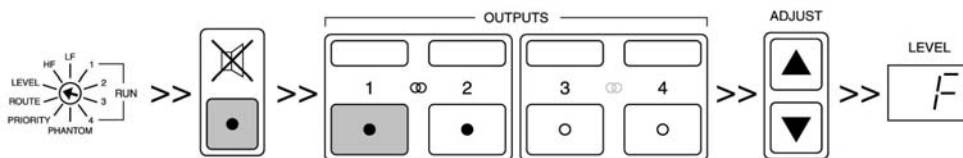
Setting maximum output level – section 3.5



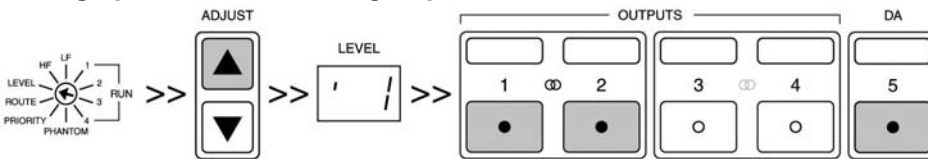
Volume offsets (balance) in Stereo pairs – section 3.5



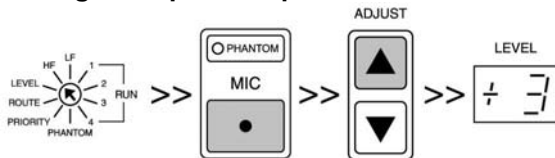
Setting minimum output levels – section 3.5



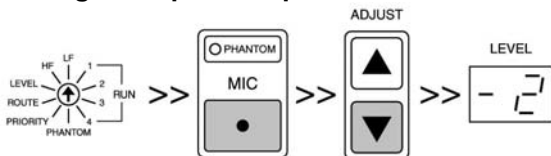
Setting up Mute and Volume groups – section 3.5



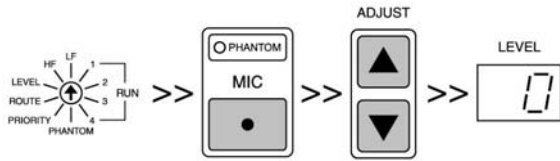
Setting Microphone equalisation HF – section 3.6



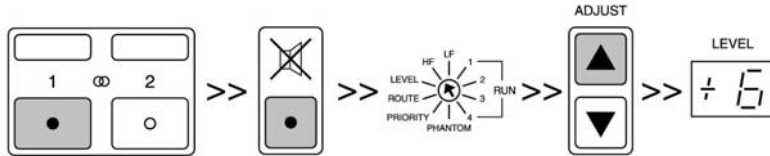
Setting microphone equalisation LF – section 3.6



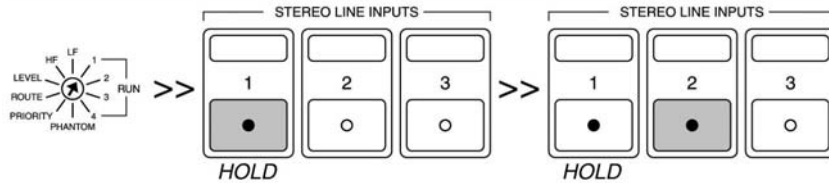
Flattening EQ settings – section 3.6



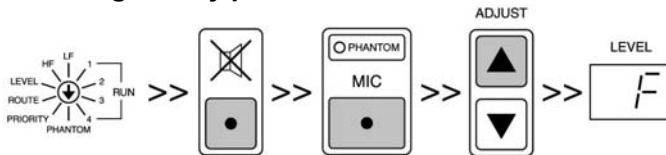
Setting equalisation at minimum output level (Adaptive EQ) – section 3.6



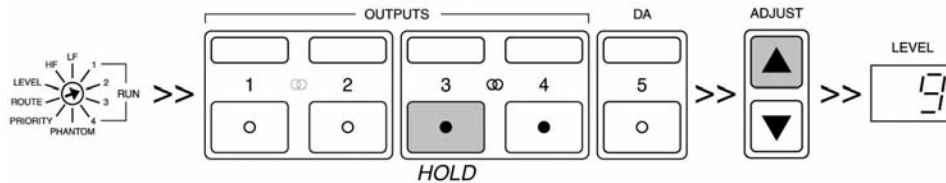
Activating source inputs for Run 1 and 2 – section 3.7



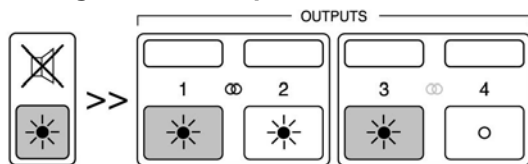
Restoring factory presets – section 3.9



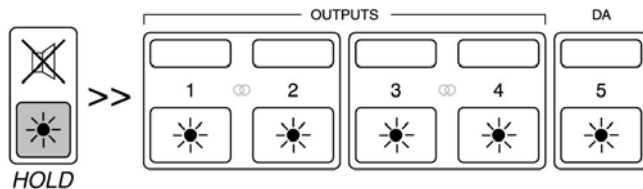
Changing volume in Run 2 and 4 – section 4.2



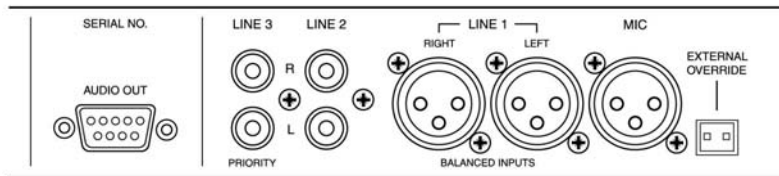
Muting selected outputs in Run 2 and 4 – section 4.2



Muting all outputs in Run 2 and 4 – section 4.2



6.0 EXTERNAL CONNECTIONS



6.1 MICROPHONE

Please note:

The ZX135 is factory configured for use with a conventional microphone. To use the optional ZX-PM1 paging microphone - see Section 11.0.

The Microphone input is balanced via a XLR-F connector with pin 2 wired hot (+ve). Input impedance is 2k and is suitable for low impedance dynamic or capacitor microphones. Phantom power is +15V - see section 5.2.

Sensitivity range is 0dB to -60dB, which also allows it to be used with line level signals. The maximum input level is +8dBu but clipping will normally be protected by the built-in limiter circuit.

6.2 LINE 1:

Line input 1 is balanced on a pair of XLR-M connectors with pin 2 wired hot (+). Input impedance is 20k and sensitivity range is +4dBu to -19dBu.

Front panel TRS break jacks give an alternative balanced connection to Line input 1. Tip is wired hot (+).

Please note:

Plugging into the front panel TRS connectors breaks the signal path from the rear panel XLRs.

6.3 LINE 2 & 3:

Line 2 and 3 are unbalanced inputs via pairs of Phono jacks. Input impedance is 10k and sensitivity range is similar to Line 1.

6.4 EXTERNAL OVERRIDE

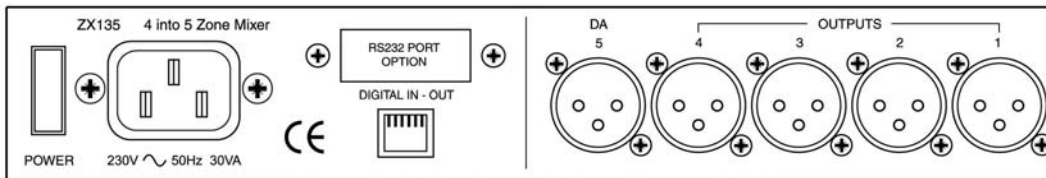
A two pin Euro-blok connection is provided for interfacing the priority override paging function with an external security circuit, such as a fire alarm system.

Please note:

The factory default mode for security circuit is **normally open contacts**. If a **normally closed or 24V** circuit is to be used this can be configured on internal jumper links - see section 8.0.

6.5 AUDIO OUT

Microphone and Line 1 - 3 audio outputs for connection to Pub Mix Expanders.



6.6 OUTPUT 1 to 5

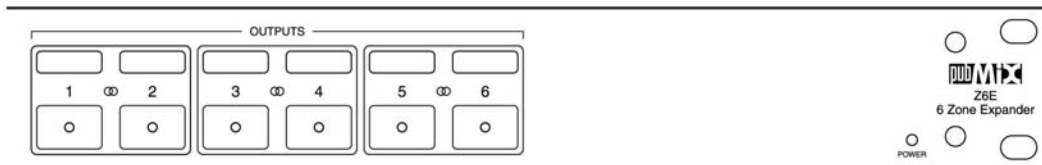
All outputs are unbalanced (ground sensing) on XLR-M connectors. Pin 2 is hot (+). When connecting to unbalanced equipment connect pins 1 and 3 together.

6.7 DIGITAL IN-OUT:

Digital control port for connecting Pub Mix Expanders and Remote Control Panels. This connector also supplies power for peripheral devices such as the ZX-R1, ZX-R2 and ZX-MR1 remote controls.

7.0 EXPANDING THE ZX135

The number of outputs can be expanded from 5 on the master unit up to 23 by adding up to three expander units each with 6 outputs. The expander units communicate with the Master unit by way of an audio interface cable and a digital interface cable. For more than one expander, these cables are connected in a daisy-chain fashion using the input and output multipin connectors on the back of each unit. The audio cable particularly should be kept as short as possible, and it is expected that the expander units will be mounted adjacent to the Master unit.



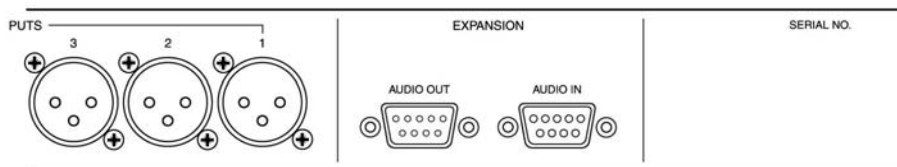
If more than one expander unit is used, then it is necessary to give each one a unique address. This is done by way of DIP switches on the rear of each unit. For each unit, these switch settings must be unique - see Expansion ID below.

It is not possible to expand the number of inputs.

MUTE and VOLUME GROUPS

When configuring Mute and Volume Groups - see section 3.5, page 16, it is not possible to have a Group which has channels split across Master and/or Expanders i.e. all channels in the GROUP must be within the same unit whether Master or Expander.

7.1 EXTERNAL CONNECTIONS



AUDIO IN:

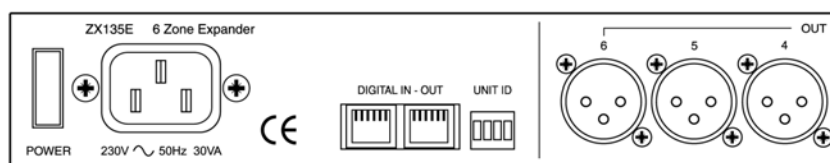
Audio inputs to Expander unit. Normally connected to the Pub Mix master - AUDIO OUT.

AUDIO OUT:

Audio outputs normally connected to a second Expander unit - AUDIO IN.

OUTPUT 1 to 6:

Ground sensing outputs, wired pin 2 hot (+).



DIGITAL IN:

Serial control port on a RJ45 connector. Normally connected to the Pub Mix Master DIGITAL IN-OUT port.

DIGITAL OUT:

Serial control port for connecting a second Expander or a Remote control panel.

EXPANSION ID:

Each Expander connected to the serial control bus must have a unique ID. The ID is simply selected by setting the associated switch, see the following table -

ID	SW1	SW2	SW3	SW4
1	ON	-	-	-
2	-	ON	-	-
3	-	-	ON	-

Please note:

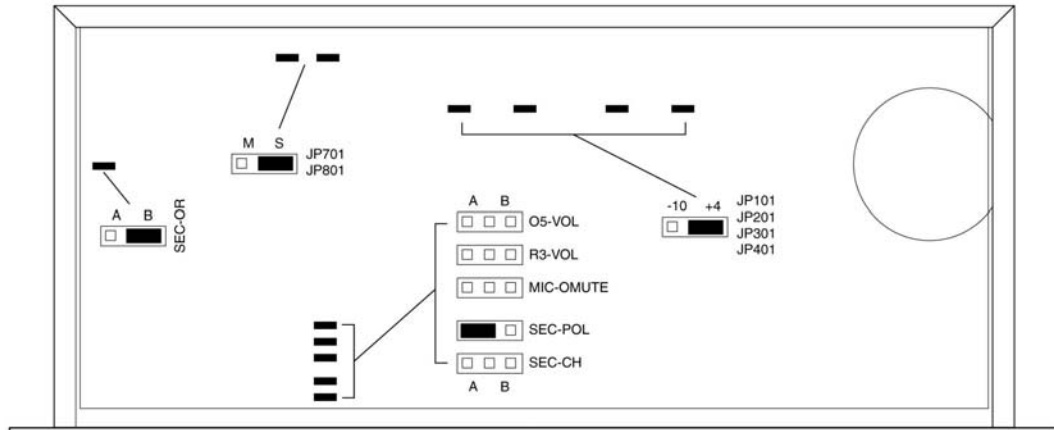
That if two switches are selected ZX135 will take the highest value.

7.2 PROGRAMMING THE ZX135 EXPANDER

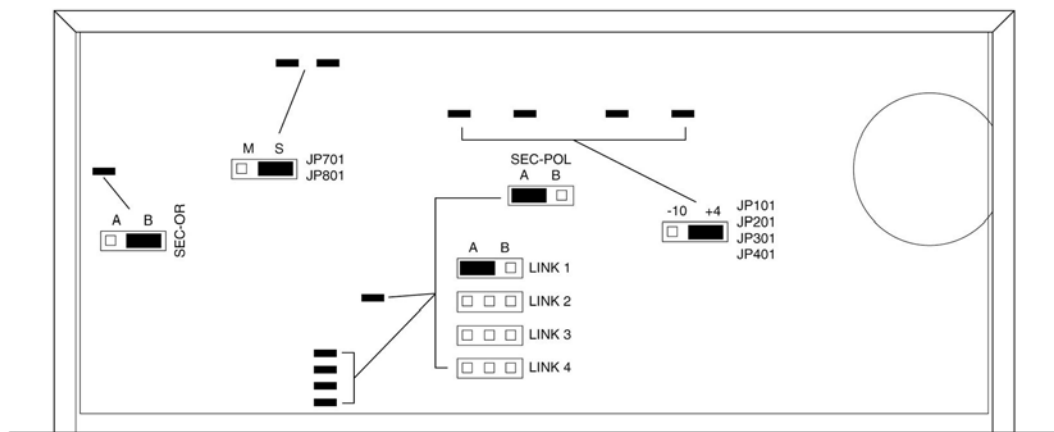
Once the expander unit is connected to the Master unit, and has a different address to the other expander units, then the system will see them as simply additional outputs, and the programming and user functions are identical to those of the Master unit.

8.0 INTERNAL JUMPER LINKS

View of ZX135 Master with the cover removed, showing the location of the Links. These are shown in black and fitted in the factory default positions.



Jumper Links on ZX135 Main Circuit board marked PMMN-3



Jumper Links on ZX135 Main Circuit board marked PMMN-4 & PMMN-5

8.1 DIGITAL and CONTROL

SEC-POL

The unit is supplied with the external override contacts set to normally open i.e. when contacts close the ZX135 mutes all inputs except the Microphone.

To change the external contacts to normally closed move the SEC-POL jumper to position B.

SEC-OR

Factory default is for the External Override to be contact operated. To change to a 24V system move the jumper link to position A.

O5-VOL (Issue 1)

Factory default is for use with a conventional microphone (position A). To change to the ZX-PM1 paging microphone move the jumper link to position B.

Please note:

R3-VOL, MIC-OMUTE and SEC-CH link positions are not used on Issue 1.

LINK1 (Issue 2)

Factory default is for the ZX-PM1 paging microphone, jumper link in position B. To change to a conventional microphone move link to (position A).

Please note:

LINK 2, 3 and 4 positions are not used on Issue 2.

8.2 **AUDIO**

JP701 and JP801

These two links allow Line input 2 and 3 to be a mono source. JP701 is for Line 2 and JP801 for Line 3. Factory default is Stereo, position S.

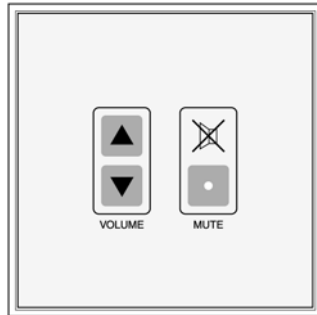
JP101, JP201, JP301, JP401 and JP501

Located in the output section these links set the output level between +4dBu and -10dBV. Factory default is +4dBu.

9.0 REMOTE ZONE CONTROLLERS

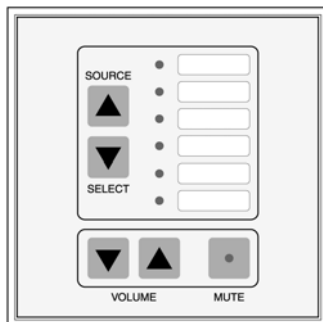
There are two remote Control panels available that control the ZX135 system via the Digital I/O network.

9.1 ZXR1 - Volume Control and Mute only



This panel allows the volume in a zone to be attenuated from the maximum level pre-set by the installer. It also allows the zone to be turned off (muted). To change the volume, use the up/down buttons. To mute the zone, press the MUTE button, which will cause the associated OUTPUT led on the ZX135 to flash. To un-mute press the MUTE button again.

9.2 ZXR2 - Volume Control, Muting and Source Select



This panel also allows input sources to be selected locally from each zone, as long as the source has been routed to that zone by the installer. Pre-printed labels can be easily produced and inserted behind the polycarbonate membrane to provide a durable and wipe clean surface.

To select the required input source, simply use the UP/DOWN buttons to illuminate the led beside the required source. The source led flashes to indicate a change request has been sent to the ZX135. Shortly after, the led comes on permanently and the source is changed.

Please note:

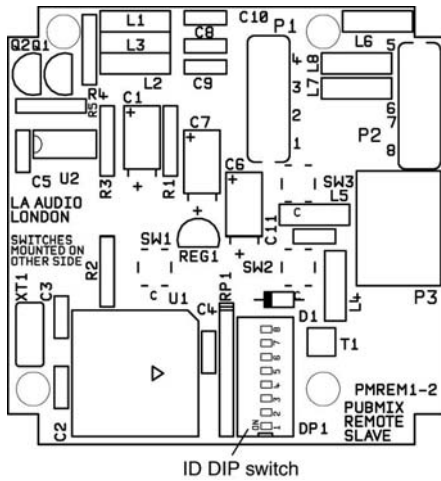
The remote Volume and Mute only work in RUN mode 2 and 4.

Remote Source select only works in RUN mode 3 and 4.

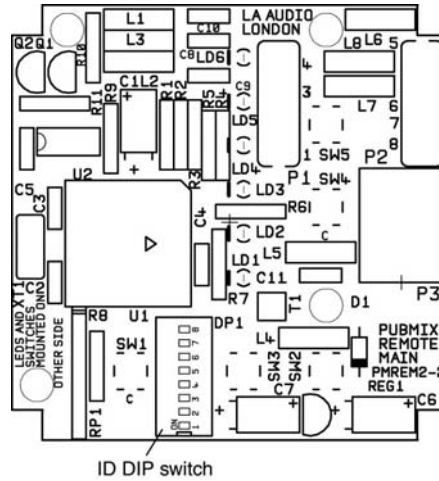
Only 3 of the available 6 source select positions work when using the ZX135. The others are for future expansion.

9.3 INSTALLING REMOTE CONTROL PANELS:

The remote control units work on an RS485 bus using commonly available CAT 5 cable and RJ45 connector system. Normally each remote unit is given a unique address assigned to the channel or zone it is controlling. This is done using DIP switches fitted to the Remote Control board at installation.



DIP switch location on ZX-R1



DIP switch location on ZX-R2

Switch assignment:

- SWITCH 1 - 5 Remote ID number
- SWITCH 6 & 7 Sub ID number
- SWITCH 8 Reserved - should be left in the OFF position.

The switches are binary weighted, the following table shows examples of setting switch 1 -5, ID number -

Switch Value	1	2	3	4	5
Zone 1	ON	-	-	-	-
Zone 2	-	ON	-	-	-
Zone 3	ON	ON	-	-	-
Zone 10	-	ON	-	ON	-
Zone 23	ON	ON	ON	-	ON

Please note:

ID '0' i.e. all switches in the OFF position, is reserved for the ZX-MR1 Master Controller.

For a stereo output the DIP switch can be set to correspond to either of the OUTPUT channels being used.

The ZX135 system allows two Remote Controllers to have the same Zone ID i.e. a Zone can be adjusted from one or more Controllers. When activated, indicators such as MUTE led will light on all Controllers sharing the same ID. However in order to prevent system conflicts each Sub Controller assigned to the same zone should be given a unique Sub ID This Sub ID is set using switches 6 & 7 -

Switch	6	7
Value	1	2
Sub ID		
1	ON	-
2	-	ON
3	ON	ON

Please note:

Sub ID '0' i.e. both switches in the OFF position, is reserved for the ZX-MR1 Master Controller.

9.4 USE OF REMOTE VOLUME WITH MUTE & VOLUME GROUPS

If Mute & Volume Groups have been set up as defined in section 3.5, a single remote may be used to control the volume of all outputs in the group. It only needs to be assigned to any output channel in the group.

9.5 PIN OUT FOR THE RJ45 CONNECTIONS

The most straight forward way to connect the ZX135 to the various peripherals is to use **CAT 5 Ethernet** cable with RJ45 cables at both ends. The cable should be wired pin 1 to pin 1, pin 2 to pin 2 etc. Pin assignment is as follows -

1	Power +	
2	Power +	
3	Network Busy	
4	RS 485 +	Wires 4 and 5 <u>MUST</u> be a twisted pair
5	RS 485 -	
6	Signal and Power ground	
7	Signal and power ground	
8	Signal and power ground	

Please note:

The Power supplied on the network is intended for powering ZX135 peripherals such as Remotes, HUB and RS232 interface.

9.6 IDC CONNECTIONS

For some installations it may be preferable to use the Insulation Displacement Connectors (IDC) fitted on all ZX135 peripherals. These are standard network type connectors which can terminate either solid core or stranded type wire. Connections should be made pin 1 to pin 1, pin 2 to pin 2 etc. and all connections i.e. eight ways, should be used.

Note: Wires 4 and 5 must be a twisted pair, the other wires can be twisted or untwisted, it does not matter.

The following table gives suitable wire types. It should be noted that two wires of similar size can be fitted to each contact -

Solid wire diameter

Wire diameter	Conductors per contact
0.4 - 0.65mm	2
0.7 - 0.9mm	1

Overall diameter including insulation: 0.7mm - 1.4mm

Stranded wire

No. of strands	Max Diameter of each wire	Overall diameter including insulation
7	0.15mm	1.10mm
7	0.20	1.20
7	0.25	1.20

Please note:

It is not possible to use 2 wires of differing diameters with either solid core or stranded wire.

9.7 NETWORK INSTALLATION CABLE LENGTHS

Typical installation cable lengths for the ZX135 network are shown in the following tables. These distances result in a minimum voltage on the network of 5.5V, required for correct operation.

Issue 1: Serial No: ZX135 0101 to 0200

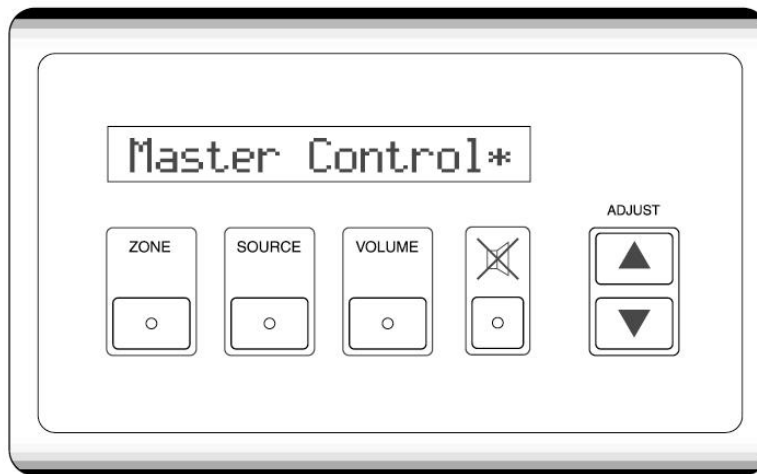
Configuration	Distance (m)
1 MR1 + 2 Rx	40
1 MR1 + 1 Rx	50
1 MR1	80
3 Rx	150
3 Rx	170
2 Rx	180

Issue 2: Serial ZX135 0201 and above

Configuration	Distance (m)
1 MR1	180
1 MR1 + 2 Rx	180
1 MR1 + 1 Rx	180
1 MR1 + 3 Rx	180
1 MR1 + 1 PM1	180
1 MR1 + 1 Rx + 1 PM1	160
1 MR1 + 4 Rx + 1 PM1	100
1 PM1	180
1 PM1 + 1 to 4 Rx	180
2 PM1 + 1 to 3 Rx	180
2 PM1 + 4 Rx	160
5 Rx	180

Where MR1 is the ZX-MR1 Master Controller, Rx is either the ZX-R1 or ZX-R2 and PM1 is the ZX-PM1 Paging Microphone

10.0 MASTER REMOTE CONTROLLER



The Master Remote Control unit (ZX-MR1) allows the system in Run modes 2, 3 or 4 to be controlled from a single wall mounted box. In programming mode, this box can be used to assign names to the sources and to the zones, which are subsequently displayed to the user on a liquid crystal display. From this unit the user can scroll through to select the desired zone to change the volume and select the source.

The Master Remote Control is connected on a RS485 network cable and can be used in conjunction with ZX-R1 and ZX-R2 individual zone controllers. Only one Master Controller can be supported on the network.

10.1 DESCRIPTION OF CONTROLS

ZONE

In RUN mode ZONE is used to select a Zone. Use the ADJUST buttons to scroll through available zones.

When naming a Zone in Programming mode, pressing ZONE repeatedly scrolls through the available Zones.

Please note:

The ZX-MR1 always uses Sub-ID 0 (zero). If there are other Remote Controls (ZX-R1 or ZX-R2) on the system then they must have their Sub-ID set to 1, 2 or 3 – see Section 10.3.

SOURCE

In RUN mode press SOURCE to change the Source for the selected Zone. Use the ADJUST buttons to scroll through the available Sources.

If you try to select Source 4, 5, 6 etc. the display returns to Source 3 i.e. the highest available Source.

VOLUME

In RUN mode press VOLUME to change the volume of a selected Zone. Use the ADJUST buttons to change the volume.

When naming a Zone or Source, in Programming mode, the VOLUME button is used to move the cursor to the left.

MUTE

Press to mute a selected Zone or press and hold (1-2S) to mute all Zones.

When naming a Zone or Source in Programming mode, the MUTE button is used to move the cursor to the right.

ADJUST

In RUN mode ADJUST is used to scroll through available Source and Zones, and to adjust the volume of a selected Zone.

When naming in Programming mode, ADJUST is used to scroll through the available characters. Upper and lower case letters, numbers and a range of punctuation marks are available.

CONTRAST

A contrast control is situated on the left hand end of the ZX-MR1.

10.2 NAMING A SOURCE OR ZONE

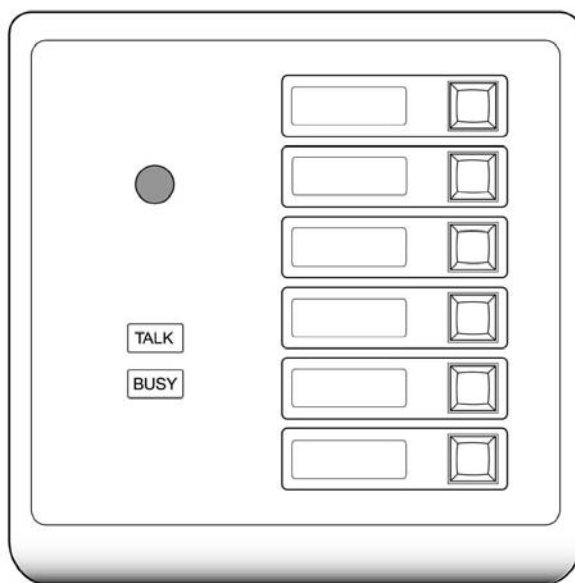
Before attempting to name Sources and Zones you should configure all Input routing and Groupings on the ZX135 first.

TO NAME A SOURCE

With the ZX-MR1 connected to the ZX135 and powered on -

- Go to Programming mode - see section 3.1 or 5.0
- Select LEVEL page with the PROGRAM switch
- Press SOURCE on the ZX-MR1. Display will show the first available source
- Press the ADJUST buttons to scroll through characters
- Press MUTE to move to the next character and repeat previous step. The VOLUME button can be used to move the cursor to the left.
- When naming complete press SOURCE to select next available Source or press ZONE to name Zones.
- When naming complete power the ZX135 off then on again to enter RUN mode.

11.0 PAGING MICROPHONE



The Paging unit (ZX-PM1) provides six installer definable paging zones. A zone ID strip can be prepared using a template prepared for 'Windows' and inserted behind the polycarbonate fascia. The Paging switches are momentary and illuminate a 'TALK' LED when pressed.

The front panel has an industry standard 10mm diameter mounting hole suitable for a wide range of goose neck microphones.

Two Paging units may be operated on the system by using a microphone cable splitter (contact LA Audio for details), before the Mic input on the ZX135 ZX135 unit. In this situation only one paging station can be in operation at any time and a priority level can be set for each station. When a ZX-PM1 is talking, the BUSY symbol is lit on all other mic stations on the system.

Please note:

By default the ZX135 ZX135 is set for operation with a ZX-PM1 paging microphone - see section 2.0 and 8.0.

11.1 PROGRAMMING THE ZX-PM1

To set ZX-PM1 routing -

- Go to Programming mode - see section 3.1 or 5.0
- Select ROUTING page with the PROGRAM switch
- Press and hold down one of the Zone buttons on the ZX-PM1. All of the OUTPUT leds on the ZX135 will light to show that the microphone is currently routed to all Outputs.
- Press the OUTPUT buttons on the ZX135 to deselect routing as required. Pressing an OUTPUT button again will reselect mic routing.
- Release the Zone button on the ZX-PM1
- To program another Zone button repeat the above procedure.

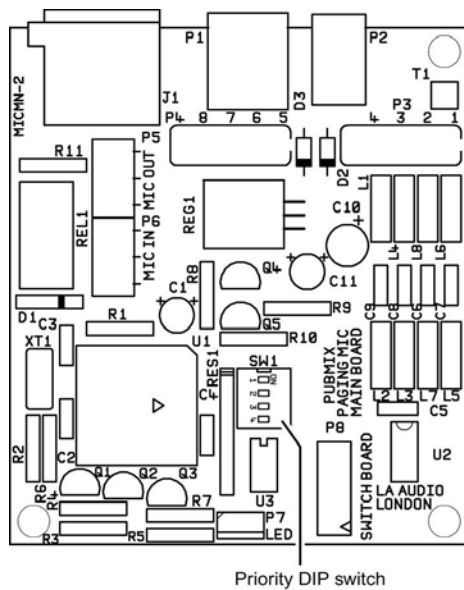
When ZX-PM1 programming completed switch the ZX135 off, select the required RUN mode and then power on again.

Please note:

In RUN mode whenever a Zone button is pressed on the ZX-PM1 the OUTPUT leds on the ZX135 light to show microphone routing.

11.2 SETTING PRIORITY LEVEL

Where two or more ZX-PM1 mic stations are used in a ZX135 system the priority of each station can be set. Up to 4 levels of priority are available and is set using a DIP switch on the ZX-PM1 circuit board.



The switches are binary weighted and are set according to the following table -

Priority level	SW1	SW2
1 - highest	OFF	OFF
2	ON	OFF
3	OFF	ON
4 - lowest	ON	ON

Please note:

Switch 3 and 4 are reserved for future expansion and should be left in the OFF position for normal system operation.

12.0 INSTALLATION

12.1 INSPECTION AND UNPACKING

The ZX135 has been carefully packed at our factory in a carton designed to withstand handling in transit. Should the unit appear to have been damaged in transit, notify your dealer immediately and do not discard any of the packing. The carton should contain -

- The ZX135 unit
- Power cord
- Operator Manual (this book)

12.2 OPERATING ENVIRONMENT

The ZX135, Z6E and peripherals are designed to operate between 0 and 40°C (32-112°F) with relative humidity no more than 80%. Should the units be installed in an equipment rack, ensure that the ambient temperature conforms to these levels.

12.3 CE STANDARDS AND THE LOW VOLTAGE DIRECTIVE (LVD)

The ZX135 and its peripherals have been designed to comply with the latest Electromagnetic Compatibility (EMC) regulations. However we recommend you do not operate the unit close to strong emitters of electromagnetic radiation such as power transformers, motors, mobile telephones or radio transmitters.

The unit should only be connected to a power supply of the type described in 9.4 POWER REQUIREMENTS or as marked on the unit. Disconnect the mains supply before removing any cover.

12.4 POWER REQUIREMENTS

The ZX135 and Z6E are factory configured for either 230V 50Hz ac or 115V 60Hz ac mains operation. Please refer to your local dealer if you require the voltage rating to be changed. A special 100V version can be supplied for Japan.

The rating of the rear panel fuse is shown on the cover -

	230V	115V	100V	
ZX135	T125mA	T315mA	T315mA	Slow blow
Z6E	100mA	200mA	200mA	Slow blow



If the fuse requires changing at any time please ensure the correct type is fitted. An incorrect fuse could cause damage to the unit and may constitute a fire hazard.

The detachable IEC mains lead connections to the appliance are coloured in accordance with the following code:

Green-and-Yellow
Blue
Brown

Earth
Neutral
Live



WARNING: THIS APPLIANCE MUST BE EARTHED

A protective earth connection, made by way of the earth conductor in the power cord, is essential for safe operation.

12.5 WARRANTY

Your LA Audio ZX135 units have been manufactured to a high standard using quality components. If correctly installed and operated the unit should give years of problem free operation.

However in the event of a defect in material or workmanship causing failure of the unit within 1 year of the date of original purchase we will agree to repair, or at our discretion replace, any defective item without charge for labour or parts. To receive service under this warranty it is necessary to return the unit to an LA Audio authorised service centre or to the factory with a dated receipt as proof of purchase. After repair the unit will be returned to you free of charge.

Limitations:

This warranty does not cover damage resulting from accident or misuse. The warranty is void unless repairs are carried out by an authorised service centre. The warranty is void if the unit has been modified other than at the manufacturers instruction. The warranty does not cover components which have a limited life, and which are expected to be periodically replaced for optimal performance. We do not warrant that the unit shall operate in any way other than as described in this manual.

13.0 SPECIFICATIONS

ELECTRICAL

Frequency Response	+/-1dB (20Hz to 20kHz)
Signal to Noise Ratio	82dB (+4dBu output)
Equivalent Input Noise	-126dB (Microphone input)
Total Harmonic Distortion	0.003% (-20dB in, +4dBu out, 1kHz)

Inputs

Microphone	4k, balanced, 3 pin XLR-F
Line 1 Input	20k, balanced, 3 pin XLR-F
Line 2 & 3 Input	10k, unbalanced, phono
Audio bus	9 pin D-Type (DB9)
Digital (Remote) bus	RJ45
External override	2 pin Euro-blok

Outputs	100R, Unbalanced, Ground sensing, 3 pin XLR-M
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Phantom Power	+15V
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Maximum input level

Microphone input	+7dBu
Line input	+16dBu

Maximum Gain	69dB (Microphone input)
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Nominal Line Level	-16dBu to +4dBu
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Output Level	+16dBu maximum +4dBu/-10dBv selectable
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Equalisation

Bass (LF)	+/-12dB @ 80Hz
Treble (HF)	+/-12dB @ 10kHz

PHYSICAL

Power connection	Detachable lead IEC 3 pin socket
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Fuses	See section 9.4
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Dimensions	483mm W (19") 44mm H (1.75") 1U 200mm D (8")
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Unit weight	3.3kg (7.3lb)
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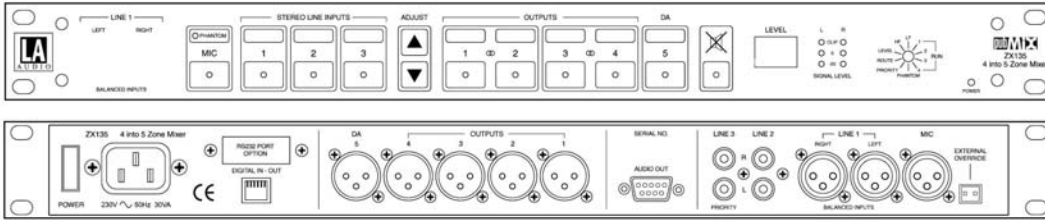
Shipping weight	3.8kg (8.4lb)
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Temperature range	0°C to +40°C operating -10°C to +70°C storage
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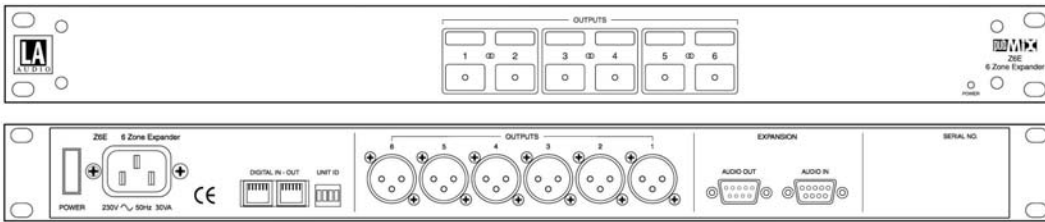
LA Audio reserves the right to alter the design specification of their products without prior notice. E&OE.

13.1 DIMENSIONS

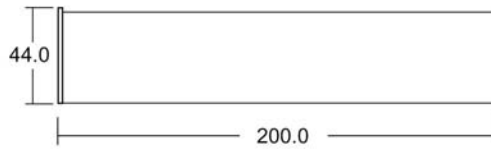
ZX135 Pub Mix Master



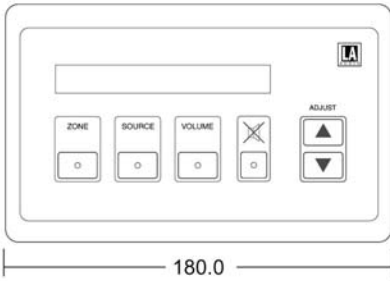
ZX135E 6 Zone Expander



483.0

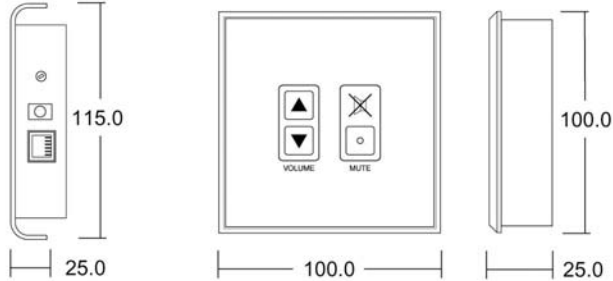


ZX-MR1 Master Remote Controller



180.0

ZX-R1 & ZX-R2 Remote Zone Controller



115.0

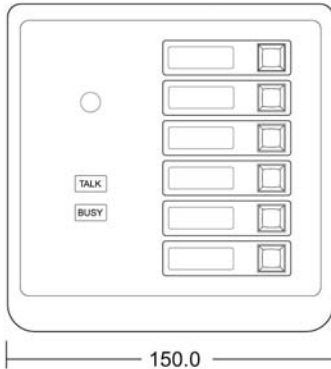
100.0

25.0

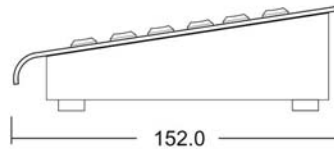
100.0

25.0

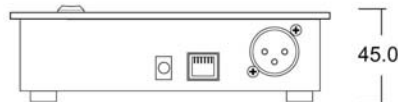
ZX-PM1 Paging Microphone



150.0



152.0



45.0