CLOCKAUDIO®

AM 81 Automatic Microphone Mixer

Operation and Installation Manual

www.clockaudio.com

Contents:

Introduction:

Clockaudio AM 81 is an 8 channel auto microphone mixer ideal for multi channel microphone systems in conference and voice reinforcement applications.

By automatically sensing when a channel becomes active the AM 81 will simply control the level of the system dependant on the priority settings, the NOMA (number of open microphones Attenuated) function will also control and adjust the mixer output to prevent feedback due to open microphone channels.

Reliance on the automatic functions is not always necessary, remote on/off control of the individual channels is also available via an RS232 port.

Expansion is easily achieved with up to 15 units able to be cascaded for medium to large system applications (120 microphones maximum).

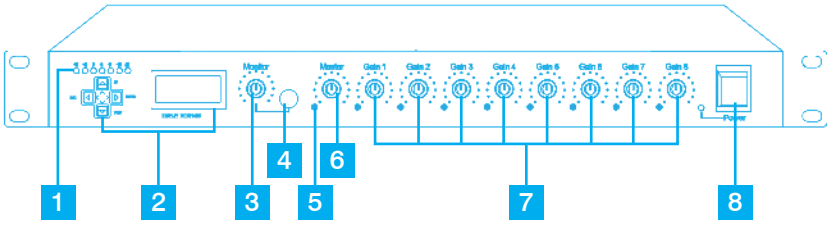
Product Overview:

1 Features

- 8x Microphone Inputs
- 1x Aux/Music Input
- Individual Priority settings
- Main Output (Balanced)
- 8x Individual Pre-Amp Outputs
- Simple LCD Display (to view and change settings and functions)
- Automatic or Manual operation.
- Remote Control options (RS232)
- NOMA facility (number of open microphones Attenuated)
- Link In /Link Out for multi system use.
- Free Standing Case supplied with optional 1U 19” Rack Mount Kit as standard.

2 Front Panel Layout

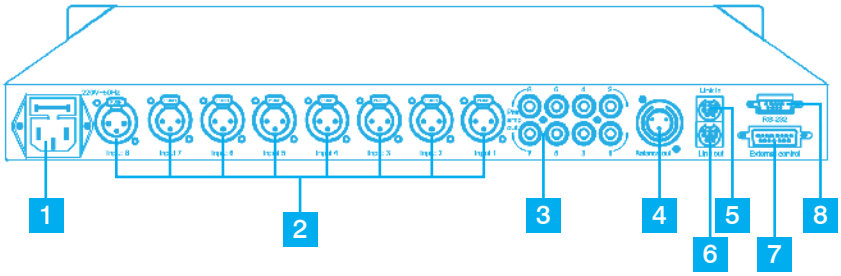
See Drawing and numbered features.



1 Output Level Indicator
2 LCD & Control Panel
3 Monitor Earphone Level Adjustment
4 1/4 Headphone Socket
5 Master Output Signal Indicator
6 Master Output Level Adjustment
7 Channel Input Gain
8 Power Switch

3 Rear Panel Layout

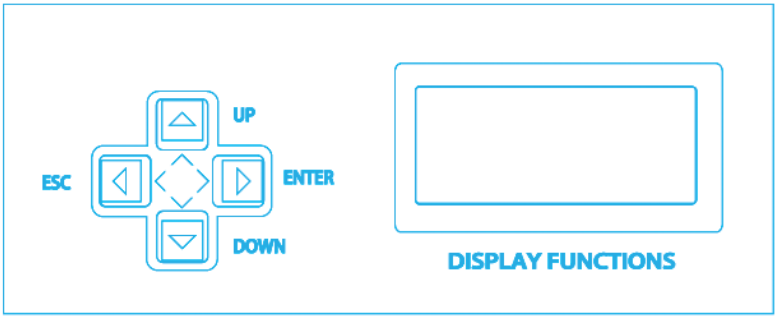
See Drawing and numbered features.



1 Fused Mains IEC Input
2 MIC Inputs
3 Pre-Amp Outputs
4 Master Audio Output
5 Cascade/Link Ports IN
6 Cascade/Link Port OUT
7 External Control Port
8 RS232 Control Port

4 LCD Panel and Controls

Individual functions and mixer set up is achieved using a simple LCD display and 4 button control panel (Enter, Up, Down and Escape)



Start Up Screen: shows model number.

Enter: to execute the screen menu function and open the configuration screen.

ESC: to quit the current location and return to the previous menu.

Up/Down: to move through the menu structure.

Note: whilst in the menu function the back light will automatically turn off if a button is not pressed for approx. 10 seconds, pressing any of the function buttons will re-activate the back light facility.

5. Dimensions

Dimensions: 48(H) x 430(W) x 221(D)mm

Weight: 3.2kg

Connecting your AM 81

1 Power

The mains power is connected via the fused IEC connector on the rear panel, power source should be 220vAC~50Hz.

2 Microphone Inputs

Microphone Inputs: The 8x Microphone Inputs are provided via 3pin XLR-Female type connectors.

Inputs may be configured to accept both Condenser type microphones, the mixer providing a +48v Phantom Power facility or Dynamic Balanced type microphones.

If connecting external equipment other than microphones, these devices where possible, should be connected at Microphone Signal Output level, to prevent overdriving/distortion of the input signal.

3 Master Output

The Master Output is used to connect the mixer to the system amplifier, processor or recording device, via balanced XLR~M connector.

Internal settings inside the mixer can be configured to provide different output configurations, including Microphone or Line Level Output options.

4 Pre-Amplifier Outputs

Pre-Amplifier Outputs are provided via mono Phono type connectors, the level from each output is 550mv 3.3K ohms. These outputs can be used for recording individual or groups of channels.

Operation of the Pre-Amplifier outputs can be configured to operate “Before” or “Behind” the gate control.

If set to “Before” the output from the Pre-Amplifier Output (Ch1~8) will output a signal, regardless of if the channel gate is open or closed.

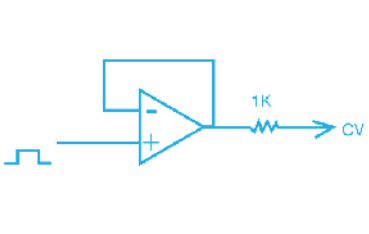
If set to the “Behind” option the output from the Pre-Amplifier is controlled by the individual gate control of the channel, when the gate is open the audio signal is passed via the relevant Pre-Amplifier Output connector (Ch1~8), and when the gate is closed the audio signal is cut off.

5 External Control Function

This remote control feature is provided via a 15pin D Type connector.

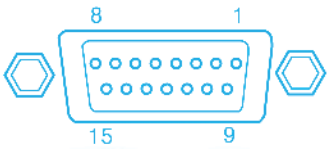
Pins 1~8 control the gain level for each channel, as well as providing switched voltage free outputs for controlling external relays and devices or LED’s.

The following references can be used.



Inner Output **Connect to LED**

PIN Instruction for External Controller Output Port:



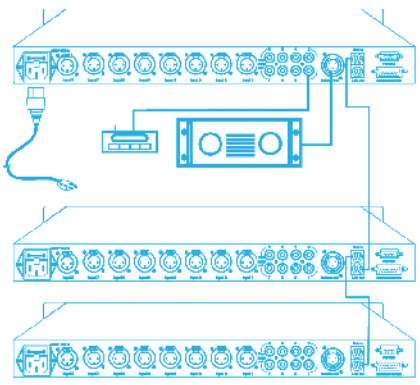
1 Channel 8 ON/OFF controlling signal
2 Channel 7 ON/OFF controlling signal
3 Channel 6 ON/OFF controlling signal
4 Channel 5 ON/OFF controlling signal
5 Channel 4 ON/OFF controlling signal
6 Channel 3 ON/OFF controlling signal
7 Channel 2 ON/OFF controlling signal
8 Channel 1 ON/OFF controlling signal
9 Ground 10. Ground 11. NC 12. NC 13. NC 14. NC 15.

Further external control of the mixer and its facilities are provided via the 9 Pin D type serial connection, the control medium is RS-232 and is compatible with AMX and Crestron type systems.

6 Expansion Options

If using the AM 81 as part of a larger system the ability to link units together is an option, units can “daisy chain” together via multi pole “Link In” and “Link Out” connections.

Up to 15 units may be configured in this way to provide a fully functioning system with a capacity of up to 120 microphones.



Expands up to 15 units

Installation and Set-Up

1 Priority Channel Configuration

Microphones allocated as Priority can gain access at any time, normally the priority microphone is used by the Chair Person of a conference for example to override the other microphones on the system.

Press the **Enter** button to enter the configuration screen.

```
1.SetMic
2.State
```

Using the **Up/Down** buttons choose **1.SetMic.**

```
1.SetMic
2.State
```

On each channel the priority is activated using the **Enter** button.

```
MIC1.OFF
MIC2.OFF
```

When priority is activated, it will show the input as **ON**.

Move through each microphone setting via the **Up/Down** buttons repeating the above until the desired priority is achieved.

When Priority is selected on any channel the corresponding LED illuminates on the front panel of the console to visually indicate the channel status.

It is possible to activate all channels as priority.

From the **1.SetMic** screen move the cursor via the **Up/Down** buttons to the **Manual.** screen.

```
Manual:   Y
          N
```

Press the **Enter** button to change the setting between **N.** (no priority) or **Y.** (all priority). This option will override any individual channel settings if already in place, removing this setting will also revert the mixer back to any previous individual settings.

In the **Y.** setting all the channel LED's illuminate on the front panel of the console to visually indicate the channel status.

2 Priority "State"

It is possible to show the priority status via the LCD panel display.

From the menu using the **Up/Down** buttons select **2.State**.

```
1.SetMic
2.State
```

Pressing the **Enter** button will provide a numeric list of channels which are set to priority.

```
P: 2 . 3 . 4 .
5 . 6 . 7
```

3 Reset

By using this function it is possible to clear all priority settings previously set on the mixer.

From the menu using the **Up/Down** buttons select **3.Reset.**

```
3. Reset
```

Pressing **Enter** will provide the option to reset **Y.** or **N.**

```
Reset?    Y
          N
```

If no priority channels are selected the AM 81 auto mixer will open only the first active channel to operate, only one channel can be active in this state.

When a priority channel is activated whilst a no priority channel is active then the priority channel will override, reducing the non priority level by -40dB (this level can be adjusted between -20dB and -40dB, with -40dB as the default).

If a non priority channel is activated whilst a priority channel is active then the non priority channel will not become active until the priority channel has become inactive.

When only priority channels are active then there will be no attenuation between active channels, they will all output at the same level.

If the system is configured as all channels with priority, the AM 81 will automatically adjust/attenuate the output level to prevent feedback.

Note: It is highly recommended that the maximum number of channels set up with priority is 4. By limiting this to 4 the possibility of feedback via the system is greatly reduced.

Detailed Settings

See printed details on inside of AM 81 lid for location of switch and potentiometer locations

1 Switching for Pre-Amplifier Output

Each output may be configured to operate before or behind the gate, this is programmed via switches on the main PCB as follows:

Ch1	Ch2	Ch3	Ch4	Ch5	Ch6	Ch7	Ch8
SW8	SW10	SW12	SW14	SW16	SW18	SW20	SW22

2 Gate Attenuation Adjustment

Attenuation of each of the individual Pre Amplifier outputs is adjusted via a series of potentiometers as follows:

Ch1	Ch2	Ch3	Ch4	Ch5	Ch6	Ch7	Ch8
VR1	VR2	VR3	VR4	VR5	VR6	VR7	VR8

3 Maximum Gate Attenuation

Two levels of attenuation are available -20dB or -40dB, this is selected via the marked switches on the main PCB as follows:

Ch1	Ch2	Ch3	Ch4	Ch5	Ch6	Ch7	Ch8
SW7	SW9	SW11	SW13	SW15	SW17	SW19	SW21

Selecting the -20dB option with the gate closed will provide an output signal to the main output, however in the -40dB position there is no output signal to the main output.

NB The factory default is set at -40dB.

4 Limiter Switch

Each channel has the option to select on or off the limiter circuit, this is selected via the marked switches on the main PCB as follows:

Ch1	Ch2	Ch3	Ch4	Ch5	Ch6	Ch7	Ch8
SW23	SW24	SW25	SW26	SW27	SW28	SW29	SW30

With the limiter switch in the off position the gain from the main output will increase to18dBV, the level from the corresponding Pre Amp output will also increase.

NB it is recommended that the volume of the selected channel is reduced to compensate this increase.

5 Adjusting Limiter Levels

It is possible to adjust the limiter levels for each channel, this is selected via the marked potentiometers on the main PCB as follows:

Ch1	Ch2	Ch3	Ch4	Ch5	Ch6	Ch7	Ch8
VR9	VR10	VR11	VR12	VR13	VR14	VR15	VR16

Adjustment of these controls will vary the maximum output volume for each channel from the main output of the mixer.

6 Output Levels

The AM 81 main output is provided via a 3pin XLR~M connector and is balanced, and is factory set at 0dB/line level. It is possible to change this output via SW5 on the main PCB, this will change the output to -50dB/mic level.

7 NOMA Settings

To enable or disable the NOMA function of the mixer please use SW6 located on the main PCB. If using the AM 81 in a larger multi mixer configuration it is recommended that the NOMA facility is switched off and any adjustments to gain levels should be made manually.

8 NOMA Level Adjustment

The NOMA levels are preset at the factory, it is not recommended to make any adjustment to this facility as this can dramatically affect the performance of the mixer.

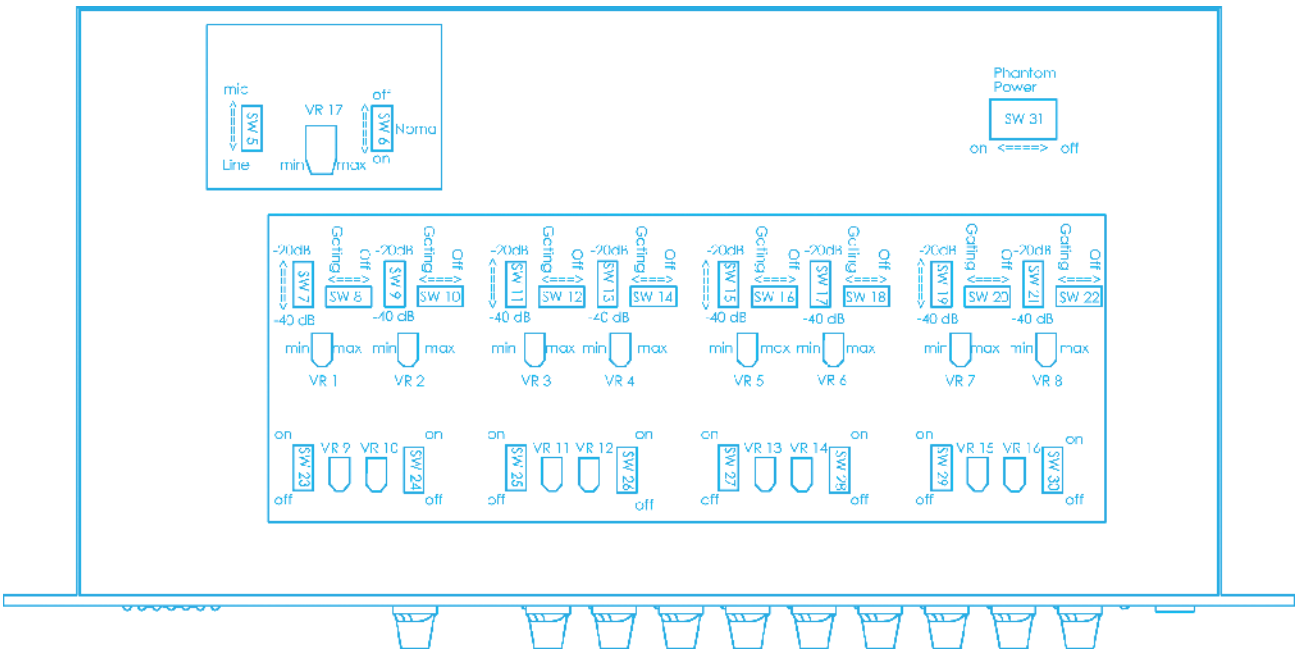
Variable potentiometer VR17 on the main PCB will allow any adjustments.

Table of Switches/Adjustments

Channel	Ch1	Ch2	Ch3	Ch4	Ch5	Ch6	Ch7	Ch8
Switch for Limiter Level	VR9	VR10	VR11	VR12	VR13	VR14	VR15	VR16
Switch for Limiter	SW23	SW24	SW25	SW26	SW27	SW28	SW29	SW30
Switch for Max Gain Attenuator	SW7	SW9	SW11	SW13	SW15	SW17	SW19	SW21
Switch for Pre-Amplifier Output	SW8	SW10	SW12	SW14	SW16	SW18	SW20	SW22
Gate Attenuation Adjustment	VR1	VR2	VR3	VR4	VR5	VR6	VR7	VR8

9 Phantom Power

Phantom Power is provided across all microphone channels preset at +48v. This facility can be switched off by using SW31 located on the main PCB.



RS-232 Control Parameters

A central controller is used to receive the address from the auto mixer and send out the instructions to control the mixer.

Communicating mode: Transmission speed is 9600dps, and data mode is: 1, 8, 1, 1 one start bit, 8 data bit, one unchecked bit (configure for 1, undefined), one stop bit. Effective control instruction is 8 bit data.

Notes:

- Transmitting by analog RS-232, you should pay attention to the check bit and stop bit.
- Pay attention to the tolerance of the speed. 9300bps ~ 9800bps is recommended.
- When using multiple auto-mixers, the mixers will set the RS232 address automatically. The address of the last auto mixer should be 01h, reciprocal second mixer should be 02h, etc. The first mixer should have the highest address.
- It could take a few moments for the address to become effective when all the units are switched on.

Microphone Control Codes:

When turning the microphone ON or OFF, the controller should send out 3 bytes of data. 0FDh + XXh (address of the auto mixer) + XXh (microphone off bit).

Microphone off bit (8 bit):

8 bit controlling data	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
Relevant microphone	MIC8	MIC7	MIC6	MIC5	MIC4	MIC3	MIC2	MIC1

1 turns the microphone ON

0 turns the microphone OFF

Final Checklist

Once all individual settings and configurations have been made to the internal control of the AM 81 it is recommended the following procedure is followed when connecting and commissioning the system, it may be an idea to have someone to assist you when carrying out this procedure.

1 Turn down the gain levels of the amplifier or host equipment or disconnect the mixer unit from the amplifier or host equipment.

2 Reduce the gain level of the Master and Input Channels (1~8) on the mixer front panel to the minimum position, also reduce the level of any connected amplifier if still linked.

3 Connect the power lead and switch on the mixer, the unit will automatically check the status for each channel.

NB 48v Phantom Power is provided for each microphone channel, the wiring for each input must be balanced, please ensure correct configuration prior to installation.

4 Set the input gain control for the required channel to approx 9 o'clock, if the channels are each set up with different input sensitivity adjust individually to provide an equal gain level.

5 Firstly test the channels not configured as priority channels.

Using the installed microphones speak clearly into the individual microphone, check both the audio output signal via the headphone socket and the visual channel indicator on the front panel of the mixer.

6 Secondly test the channels set up with priority.

Priority channels are active simultaneously, speak into the microphone connected to the priority channel and check the visual indicator on the front panel.

Next speak into the microphone of the priority channel whilst a colleague is speaking into a non priority channel, the level of the no priority channel should reduce/ attenuate by up to -40dB.

7 Once satisfied with the above test procedure, set the mixer to the desired operational levels and increase the levels or re-connect the host amplifier/equipment.

In many typical applications the Chairman's microphone position is usually set up with priority, in this scenario please do not locate the chairmans microphone close to or facing any installed loudspeakers. Because this microphone is likely to be active for long periods we advise taking the above guidance to avoid any potential for the microphone picking up the loudspeaker signal and preventing the opportunity of any feedback issues.

Technical Specification

Input Impedance	MIC 4300Ω, AUX 50KΩ
Output Impedance (balanced)	MIC 15KΩ, Line 220Ω
Output Impedance (unbalanced)	1KΩ
Pre-Amplifier Output Impedance	3.3KΩ
Max Input Level	MIC -18dBv, AUX 6dBv
Max Output Level (Balanced)	MIC -18dBv, Line 21.5dBv
Standard Input Level (Balanced)	MIC -28dBv, Unbalanced AUX 2.5dBv
Pre-Amplifier Output Level (Balanced)	MIC -25dBv, Line 0dB
Pre-Amplifier Output Level	-4.4dBv
Max Gain	62dB
Frequency Response	20Hz~20KHz
Noise	All channels with the max gain position (220Ω) -85dB
THD+N	≤0.5%
S/N	75dB
Phantom Power	+48v
Controlling Output Voltage*	5v
Power Voltage	AC220v
Current Consumption	25W
Dimension	48(H) x 430(W) x 221(D)mm
Weight	3.2kg

Security and Safety

- To prevent the potential for electric shock please take extreme care in making any adjustments or altering any settings.
- Whilst the unit is DC powered ensure that no contact is made to the Power Supply or DC Power Jack.
- Please check the Supply Voltage is correct prior to plug in and switch on.
- When configuring internal settings please use an electrically insulated tool or plastic implement to operate any switch settings or adjust any level controls.
- When installed make sure the unit is earthed/grounded correctly.
- Do not use the mixer in conditions of extreme dust or extreme humidity.

DANGER!

PLEASE ENSURE THE POWER SUPPLY IS SWITCHED OFF BEFORE REMOVING THE TOP COVER TO MAKE SYSTEM ADJUSTMENTS.

As part of a continuous product improvement programme, we reserve the right to alter specifications without prior notice.

CLOCKAUDIO®

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