RM SERIES

Rackmount 100V mixer-amplifiers

Item ref: 953.110UK, 953.111UK, 953.112UK

User Manual

⚠	Caution: Please read this manual carefully before operating Damage caused by misuse is not covered by the warranty

Introduction

Thank you for choosing the Adastra RM-series rackmount 100V amplifier as part of your public address system. This amplifier is designed to offer high quality, dependable service for mobile and installed systems. Please read this manual fully and follow the instructions to achieve the best results with your new purchase and to avoid damage through misuse.

Warning

To prevent the risk of fire or electric shock, do not expose any components to rain or moisture.
If liquids are spilled on the casing, stop using immediately, allow unit to dry out and have checked by qualified personnel before further use. Avoid impact, extreme pressure or heavy vibration to the case
No user serviceable parts inside – Do not open the case – refer all servicing to qualified service personnel.

Safety

- Check for correct mains voltage and condition of IEC lead before connecting to power outlet
- Use double insulated speaker wire with adequate current rating for 100V speaker connections
- Do not use 8Ω and 100V terminals at the same time
- Do not allow any foreign objects to enter the case or through the ventilation grilles

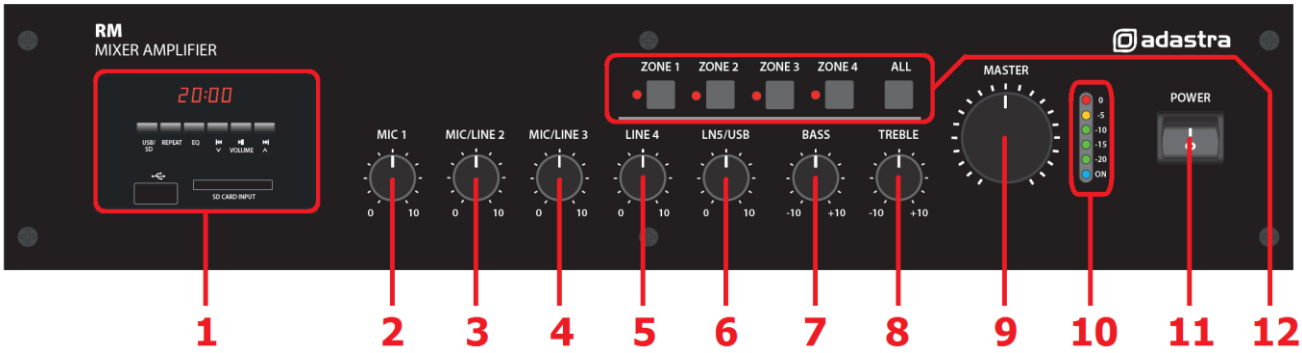
Placement

- Keep out of direct sunlight and away from heat sources
- Keep away from damp or dusty environments
- For rack-mounting, ensure adequate support for the weight of the amplifier
- Ensure adequate air-flow and do not cover cooling vents at the front and rear of the amplifier
- Ensure adequate access to controls and connections

Cleaning

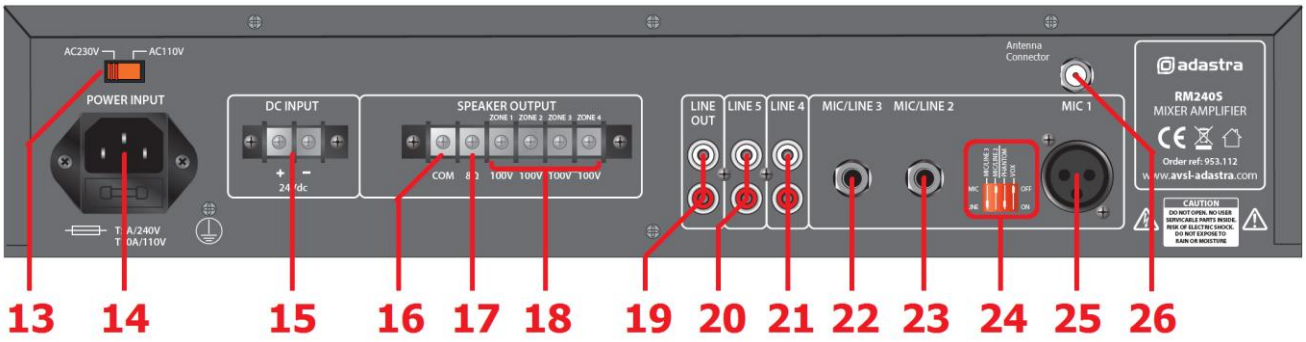
- Use a soft cloth with a neutral detergent to clean the casing as required
- Use a vacuum cleaner to clear ventilation grilles of any dust or debris build-ups
- Do not use strong solvents for cleaning the unit

Front panel



1. USB/SD audio player (+FM tuner RM240S)
2. MIC 1volume control
3. MIC/LINE 2 volume control
4. MIC/LINE 3 volume control
5. LINE 4 volume control
6. LN5/USB volume control
7. BASS EQ control
8. TREBLE EQ control
9. MASTER volume control
10. VU meter LEDs
11. POWER switch
12. Speaker zone switches (RM240S only)

Rear panel



13. Mains voltage switch
14. IEC mains inlet & fuse holder
15. DC power terminals
16. COM speaker terminal
17. 8Ω speaker terminal
18. 100V speaker terminal(s) - Note: 4 zones for RM240S
19. LINE OUT connectors (RCA)
20. LINE 5 input (RCA)
21. LINE 4 input (RCA)
22. MIC/LINE 3 input (6.3mm jack)
23. MIC/LINE 2 input (6.3mm jack)
24. DIP switches (see DIP switches section below)
25. MIC 1 input (balanced XLR)
26. Antenna connection for FM tuner (RM240S only)

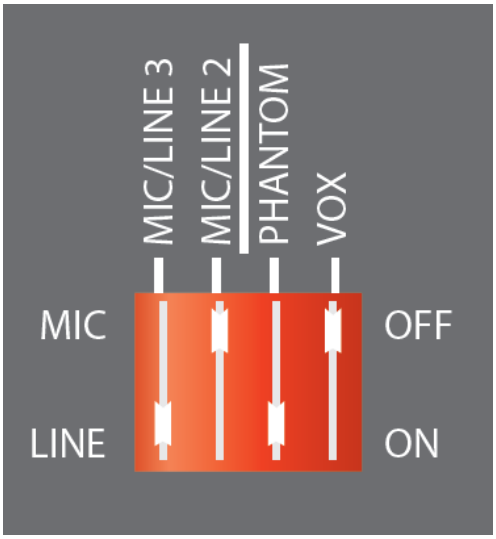
Connection and setup

Connect the rear IEC inlet (14) to the mains using the supplied mains lead (or an equivalent approved type). Ensure that the voltage is correct as indicated on the voltage selector (13) and that the mains outlet is switched on.

Alternatively, the amplifier can be powered by a 24V battery, such as a lorry or boat battery, by connecting the "+" and "-" of the battery to the 24Vdc INPUT (15) on the rear panel. Ensure that DC cables are capable of handling the current (10A min. recommended)

The RM series amplifiers have a total of 5 input channels. MIC 1 input (25) is fed to a dedicated microphone channel. Connect the main announcement microphone to this channel using a balanced XLR lead.

DIP switches



MIC 1 channel has an option for +20V phantom power for condenser microphones and paging microphones with chimes.

MIC 1 also has the option of VOX control, which attenuates the line input channels 4 and 5 by -40dB when MIC 1 signal is detected and returns them to normal when MIC 1 signal is silent.

These features are set by DIP switches (24) as shown here. Moving the DIP switch down will switch the feature ON.

MIC/LINE 2 (23) and MIC/LINE 3 (22) jack inputs can be set to MIC or LINE sensitivity to suit the type of input being used. Moving the relevant DIP switch down selects LINE sensitivity. Moving the DIP switch up selects MIC sensitivity.

Be sure to make these DIP switch settings when the amplifier is switched off. Making any changes when the amplifier is powered up may cause loud bangs through the system which can damage the speakers.

Connect microphones or mono line inputs to MIC/LINE 2 and MIC/LINE 3 inputs using good quality 6.3mm jack leads. Make sure the correct sensitivity is selected for the type of input source.

Connect any other line level audio inputs to the LINE 4 (21) and LINE 5 (20) connectors on the rear panel using good quality RCA leads. Since RM series amplifiers are mono output, stereo signals will be summed together.

Further mixer-amplifiers or slave amplifiers can be connected from the rear LINE OUT sockets, again using a good quality RCA lead. This output carries the full mix of all channels 1 – 5 as produced through the speakers.

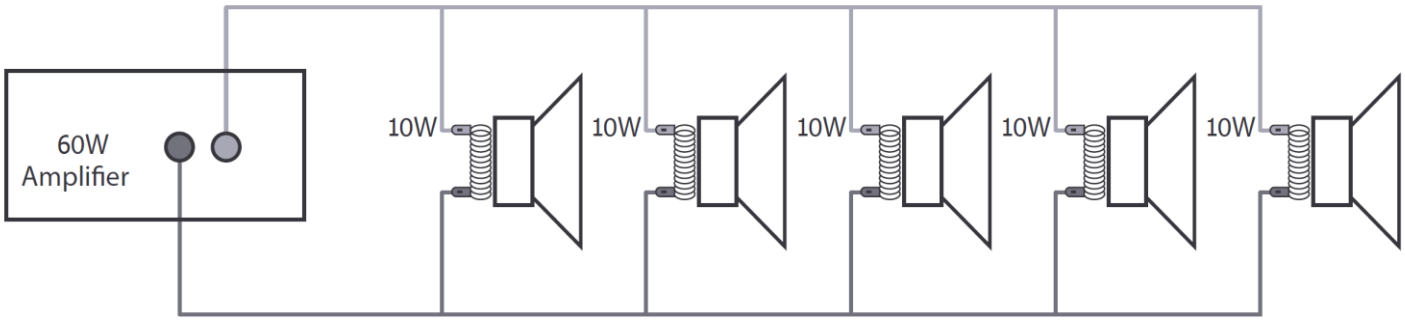
Speaker outputs

The RM series amplifiers can be used either as 100V line amplifiers or standard low impedance power amplifiers. These 2 configurations cannot be used together, so it is important to decide which method will be used at the start.

100V line systems

For 100V line systems, connect the amplifier to the first speaker in the system using double-insulated speaker wire which has adequate current rating to handle the total output of the amplifier.

Connect the "100V" (17) output terminal to the positive (+) connection of the speaker and "COM" output (15) to the negative (-) connection of the speaker. Connect further speakers in parallel to the first speaker with all positive terminals and connected together and all negative terminals connected together as shown below.



A 100V line speaker system can comprise of many speakers connected together. The determining factor for how many speakers can be used on a single amplifier is the power rating. For most purposes, it is advised to connect as many speakers as needed with a combined wattage of no more than 90% of the amplifier's output power rating.

The terminals of a 100V speaker are connected to a transformer and in some cases, this transformer may be "tapped" for different power ratings. These tappings can be used to adjust the wattage (and output volume) of each speaker in the system to help achieve the ideal total power of the system for the amplifier.

Speaker switching zones

For the RM240S model, there are 4 separate "100V" terminals. Connecting the positive (+) connections of 4 speakers (or groups of speakers) to each 100V terminal and all the negative (-) connections together to "COM" will give switching control over these 4 "zones". The total combined speaker wattage connected to all outputs should not exceed 90% of the amplifier power rating.

Low impedance systems

The CM and CS series amplifiers can provide an output for a single 8Ω speaker by connecting the "8Ω" output (16) to the positive (+) speaker connection and "COM" output (15) to the negative (-) speaker connection. It is important to ensure that the speaker load is no less than 8Ω and that the power handling of the speaker is equal to or greater than the output power of the amplifier.

Operation

When all connections to the amplifier are made, turn all rotary controls down and switch on the power (11) and a power "ON" LED will illuminate. Turn BASS and TREBLE controls to the 12 o'clock position (pointing straight up) and turn the MASTER rotary control (5) up part way for testing.

Ensure a signal is being fed to one of the line inputs 2, 3, 4 or 5 and gradually increase the volume control for that channel until the output is heard through the speakers. Turn up the MASTER to the maximum required volume level and reduce the channel volume control if necessary.

Repeat this process for any other line inputs connected to channels 2, 3, 4 or 5.

Note: If a line input is not connected to a RM series mixer-amplifier, the initial test can be made using the built-in USB/SD audio player. See section below for instructions.
Both the audio player output and LINE 5 input are governed by the LN5/USB volume control.

The output of the amplifier is represented on the VU meter LEDs (10) and care should be taken that the Red "0" LED is only lit momentarily during use. Anything longer than a short flash of this LED may be indicating distortion or clipping of the output signal and the MASTER should be turned down.

If a microphone is connected to MIC 1 input, make sure it is switched on and if it requires phantom power, make sure this feature is enabled. Gradually increase the MIC 1 control (2) whilst speaking into the microphone until the required volume level is reached. The microphone should not be able to "hear" the speakers, which can cause feedback (squealing or howling noise).

Repeat this process for microphones connected via the MIC/LINE 2 and MIC/LINE 3 inputs.

If the VOX feature is enabled, audio playback through channels 4 and 5 will be reduced in volume automatically when speaking into MIC 1.

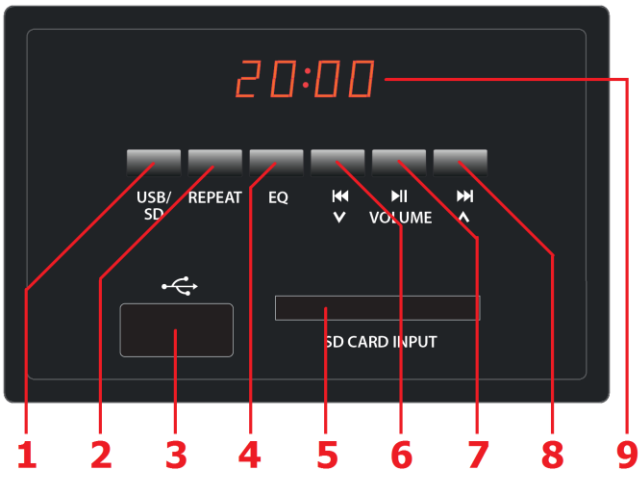
In addition to channel and MASTER volume controls, there are BASS and TREBLE EQ controls to adjust the tone of the overall output. At the 12 o'clock position, these controls are applying no effect to the signal (no boost or cut).

Moving the BASS control clockwise boosts the low frequencies in the audio, whilst moving it anticlockwise will cut these low frequencies.

Likewise, moving the TREBLE control clockwise boosts the high frequencies in the audio, whilst moving it anticlockwise will cut these high frequencies.

Adjust these EQ controls to suit the type of audio signal or compensate for the room acoustics.

USB/SD/(FM) audio player



1. USB / SD / (FM) input source selector
2. REPEAT button (repeat play / random play)
3. USB port: accepts USB storage device
4. EQ select: step through 5 different presets
5. SD CARD INPUT
6. Previous track/FM channel, volume down
7. Play/Pause track or FM channel select mode (press and hold for FM auto tune)
8. Next track/FM channel or volume up
9. LED digital display

RM60 and RM120 are fitted with a built-in USB/SD audio player. This unit allows playback of music or audio messages which are stored as standard compressed audio files on either USB pen drive or SD card. RM240S adds an FM tuner to this audio source, for which there is a rear antenna connection.

Push the USB pen drive into the USB port (3) and/or SD card into the SD card input (5) and the audio files will start to play automatically. Turn up the USB/SD rotary control gradually to hear the output from the speakers and increase to the required level. If play does not start automatically, press the USB/SD button (1) and Play/Pause button (7) to check if the player is set to play from the required memory device. Try Previous track and Next track buttons (6, 8) if the selected track is unable to play. Otherwise, check that the audio files are standard compressed type.

The USB/SD button (1) switches between the USB memory device and SD card, allowing a choice of audio source. Normal playback will read through all tracks on a storage device. Press the REPEAT button (2) once to continually repeat the current track, press REPEAT again to enter the random track selection mode. Pressing the EQ button (4) steps through 5 preset equalizer settings, offering different tonal responses to suit the type of music or compensate for room acoustics.

Pressing the Previous track button (6) briefly steps backwards through tracks on the memory device. Press and hold this button to decrease the playback volume.
Pressing the Next track button (8) briefly steps forwards through tracks on the memory device. Press and hold this button to increase the playback volume.
To pause the current track, press the Play/Pause button (7) and press it again to resume playback. The LED digital display (9) will show the track number when a track is selected and then the elapsed time when it is playing.

For RM240S, in the USB/SD button can also select FM mode. Connect an external antenna to the rear panel connector (26) and press and hold the PLAY/PAUSE button – this will initiate the auto tune mode, which searches and stores all available FM radio stations. Press PLAY briefly to toggle between frequency select and channel select modes. In frequency select, the NEXT/PREVIOUS buttons scan manually tune through FM frequencies. In channel select, the NEXT/PREVIOUS buttons step through stored stations.

To avoid loud pops through the speakers, turn down the MASTER control before powering down.

Specifications

	RM60	RM120	RM240S
Power supply	110/230Vac, 50/60Hz (IEC) or 24Vdc option (screw terminals)		
Output power: RMS	60Wrms	120Wrms	240Wrms
Outputs : Speaker	100V / 8 Ohm / COM	100V / 8 Ohm / COM	4 x 100V / 8 Ohm / COM
Output: Line	RCA signal output		
Inputs	Mic XLR, 2 x mic/line jack, 2 x RCA line		
Volume controls	Mic1, mic/line2+3, line4+5 (USB), master		
Equalizer : Bass / Treble	100Hz ±10dB / 10kHz ±10dB		
USB/SD/(FM) controls	USB/SD, repeat, EQ, rev/vol-, play/pause, forward/vol+		
Rear panel DIP switches	Phantom, Vox, Mic/Line (2 + 3)		
Phantom power	+20V (MIC 1 input)		
THD	<1.0%		
Dimensions	433 x 320 x 89mm		
Weight	5.98kg	8.36kg	9.62kg

Troubleshooting

No power LED on control panel	Ensure IEC lead is in good condition and connected properly
	If 24Vdc power input is being used, check battery is charged
	Ensure POWER switch is on and check mains inlet fuse
Power LED is on but no other LEDs and no output	Check input signals and condition of input connection leads
	Check MASTER, MIC, LINE or USB/SD volume controls are turned up
Power light and output LEDs lighting but no output	Check speaker output terminals are connected correctly
	Check speakers are working (test on another amp if available)
USB/SD player will not play audio from media	Press PLAY on transport controls
	Check memory device is connected properly (remove and re-insert)
	Check file types – standard compressed digital audio files required
	Check memory device works on a PC or Mac for standard playback
Output is very loud or distorted	Check level of input signal is not too high
	Reduce MIC, LINE IN, USB/SD and/or MASTER level
Output is working but at very low level	Check input audio source level is not too low
	Increase MIC, LINE IN, USB/SD and/or MASTER level
	Check for quiet recording of media files on USB
	Check VOX override is not unintentionally suppressing audio playback
No microphone output	Check phantom power is enabled if using a condenser microphone
Feedback from microphone	Face microphone away from speakers and monitors
	Turn down MIC and/or MASTER level
Amplifier overheating	Ensure cooling vents are clear from debris and dust
	Check that 8Ω speakers are not connected to 100V terminals
	Ensure total 100V speaker wattage is lower than amplifier rating
	Ensure that 100V and 8Ω speakers are not connected simultaneously
	Ensure that total load connected to 8Ω output is not less than 8Ω

Disposal: The "Crossed Wheelie Bin" symbol on the product means that the product is classed as Electrical or Electronic equipment and should not be disposed with other household or commercial waste at the end of its useful life. The goods must be disposed of according to your local council guidelines.

Errors and omissions excepted.