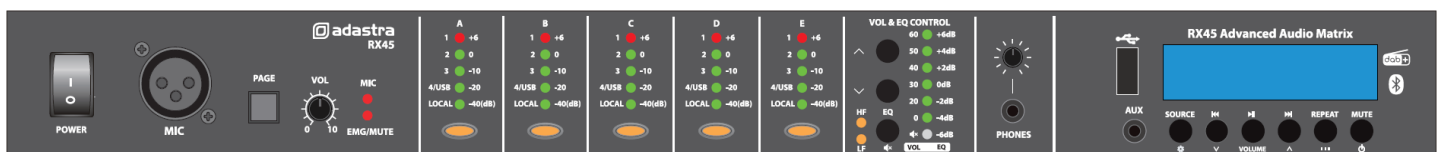
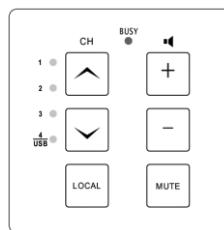


# RX45

## ADVANCED AUDIO MATRIX

Item ref. RX45: 953.046UK  
(optional) TR86: 953.050UK

User Manual



Version 1.0



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

## Introduction

Thank you for choosing the Aداstra RX45 remote audio matrix system for your distributed audio installation. This unit is designed to offer a flexible and expandable solution for a wide array of commercial sound systems. Please read this manual to gain the best results from your product and avoid damage through misuse.

### SAFETY SYMBOL AND MESSAGE CONVENTIONS



**CAUTION**  
RISK OF ELECTRIC SHOCK  
DO NOT OPEN

**AVIS**  
RISQUE DE CHOC ELECTRIQUE NE PAS  
OUVRIR



This symbol indicates that dangerous voltage constituting a risk of electric shock is present within this unit



This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit.



### SAFETY NOTICE

1. Prior to use, read through this manual
2. Keep the manual in good condition
3. Pay attention to safety warnings
4. Observe all operating requirements
5. Do not use the device near water or wet areas
6. For cleaning, only use a lint-free, dry cloth
7. Install according to the specifications
8. Place away from heat sources or heating appliances
9. Use mains lead provided and avoid damage to cable or connectors
10. Unplug power from mains during stormy weather or if unused for long periods
11. In case of malfunction, water ingress or other damage, consult qualified service personnel
12. Do not place in damp areas or near liquids or moisture. Do not spill liquids on the housing
13. Please pay attention to warning symbols during transit and placement
14. Terminals marked with the ⚡ symbol are HAZARDOUS LIVE and should only be connected by qualified personnel
15. Ensure that the apparatus is connected to a mains socket with a protective EARTH connection
16. Ensure correct operation of the mains switch

### 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

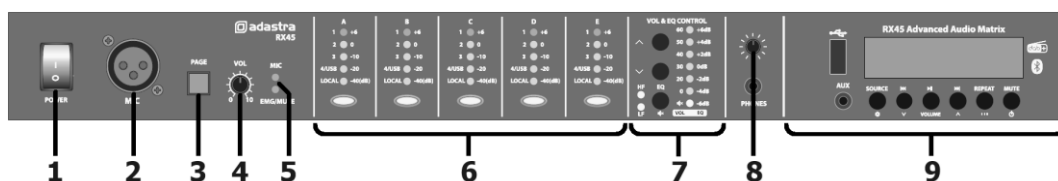
### Placement

- This unit can be used free-standing or fixed into a 19" rack
- Ensure adequate support and access to controls and connectors when rack-mounting

### Cleaning

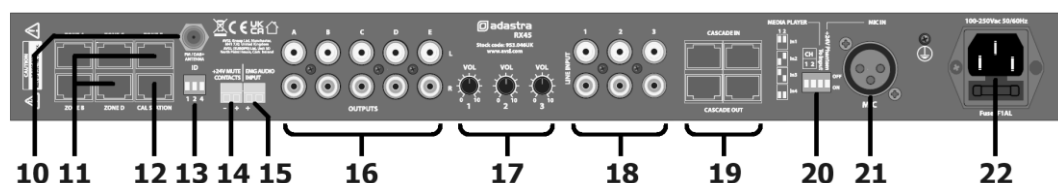
- Use a soft cloth with a neutral detergent to clean the housing as required
- Do not use strong solvents for cleaning the unit

## Front panel



- |                                  |  |
|----------------------------------|--|
| 1. Mains power on/off switch     | 6. Output zones selectors & indicators |
| 2. Paging microphone input (XLR) | 7. Selected zone edit section          |
| 3. Page on/off button            | 8. Headphones output & volume control  |
| 4. Paging microphone level       | 9. Media player section                |
| 5. MIC & EMG/MUTE indicators     |  |

## Rear panel



- |   |  |
|---|--|
| 10. DAB+/FM antenna connection (F-type) | 17. Line input level controls                  |
| 11. TR86 remote control inputs (RJ45)   | 18. Line inputs 1, 2, 3 (L+R RCA)              |
| 12. CS-5 call station input (RJ45)      | 19. Cascade links (2 x RJ45 in, 2 x RJ45 out)  |
| 13. Group ID set DIP switches           | 20. Media player assign & phantom DIP switches |
| 14. 24Vdc emergency mute contacts       | 21. Paging microphone rear input (XLR)         |
| 15. Emergency audio line input contacts | 22. Mains power inlet (IEC) with fuse holder   |
| 16. Zone line outputs (L+R RCA)         |  |

## Connection

Connect outputs to each zone from the line level L+R RCA OUTPUTS on the rear panel (16)

Up to 3 stereo line level inputs can be connected to the RX45 via the rear panel L+R RCA LINE INPUTs (17) (A further stereo 3.5mm AUX input is available on the front panel as a selectable source on the media player)

Ensure the Power (1) is switched off until all input and output connections are in place.

The zones of the RX45 can be controlled directly from the front panel or can also be remotely controlled by connecting up to five optional TR86 wall plates (ideal for local control from within each relevant zone). TR86 wall plates are connected via RJ45 connectors (11) on the rear panel with CAT5/6/7 cable to each TR86. The RX45 can provide power to each wall plate up to 100m away. (adding external 24V power to the TR86 wall plate can extend this distance up to 1km)

For remote announcement to all or any of the 5 zones, an optional CS-5 call station (953.049UK) can be added to the system. If a CS-5 call station is being used, connect this to the call station input (12) on the rear panel using network cable.

For announcements to all zones from the main RX45 unit, a paging microphone input is provided on the front or rear panel (2, 21). If the paging microphone requires phantom power (e.g. condenser mic), enable this by selecting the phantom power DIP switch (20) to "ON".

If DAB+ or FM radio is to be used, connect a DAB+/FM antenna to the rear panel 'F' socket (10)

24V MUTE CONTACTS (14) can be connected to the 24V trigger of an alarm system panel to mute playback. If a line level siren or alert signal is available, this can be connected to the EMG AUDIO IN terminals (15).

When all other connections are made, connect the mains power to the IEC inlet (22) using the supplied lead.

## Configuration

The RX45 can operate standalone or as part of a larger zoned network using multiple RX45 units. A standalone RX45 can serve up to 5 independent stereo output zones.

RX45 units can be cascaded in a 'daisy-chain' by connecting 2 CAT5/6/7 patch leads from the CASCADE OUT of the first unit to CASCADE IN of the next unit (19). It is important to connect the left-side CASCADE OUT to the left-side CASCADE IN and right-side CASCADE OUT to right-side CASCADE IN. Do not cross the patch cables as this will cause malfunction. The receiving RX45 can be linked onto further units by linking CASCADE OUT to IN in a similar fashion.

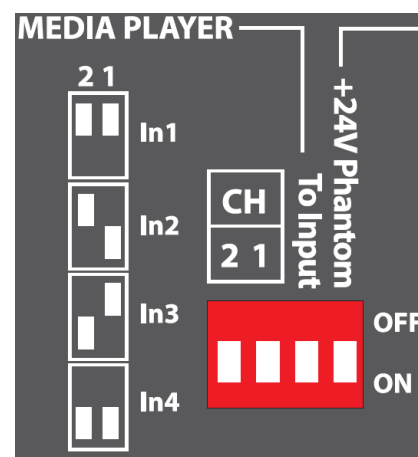
When RX45 units are cascaded together, the 3 stereo LINE INPUTS (18) are all linked together in parallel. This is to allow all cascaded RX45 units to access the same audio sources. It is advisable to only connect line input sources to the first RX45 in the cascade to avoid any conflicting signals (for example, connecting an mp3 player to LINE INPUT 1 on the first RX45 *and* a CD player to INPUT 1 on the next RX45 will result in playback from both signals competing on the same channel)

In a cascade arrangement, the media player on the first RX45 in the chain can be assigned as an audio source for subsequent RX45 units using the MEDIA PLAYER DIP switches next to the "+24V Phantom switch" (20) as shown opposite.

Selecting the 3 leftmost DIP switches to "ON" (down) on the first (master) RX45 unit allows the signal from its media player to be fed onto the subsequent connected units. (i.e. all DIP switches down except "+24V Phantom" unless phantom is used)



On the master RX45 unit, this setting makes its media player available to subsequent cascaded RX45 units.



Selecting the 'MEDIA PLAYER - To Input' switch to "on" on the subsequent cascaded RX45 units enables them to use this signal from the master RX45 media player and the leftmost 2 DIP switches determine which input channel it appears on: In1, In2, In3, or In4/USB)

(for example, if a cascade linked RX45 unit needs the master RX45 unit's media player to appear on its LINE INPUT 3, switch down the 'MEDIA PLAYER - To Input' and the second DIP switch (CH-2) down.



On an RX45 unit that is cascaded, this setting makes the media player from the first unit appear on its LINE INPUT 3

If the master RX45's media player is assigned to one of the line inputs of a cascade linked RX45 and another source is played through that line input, it will override the master RX45's media player signal. It is important to keep track of which signal inputs are connected to or assigned to which channels.

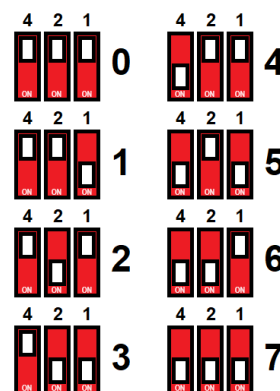
Even when linked in cascade with other units, the MIC input (2, 21) only operates on the 5 zones of the individual RX45 unit. To page across cascaded units from a single microphone requires a call station. For this purpose, 8 different group IDs can be set, providing up to 40 distinct zones (8 x 5 zones) using the group ID DIP switches (13)

## Call Station

When using a CS-5 call station (instructions further on in this manual) to address up to 5 zones, the output will depend upon the group ID set on each RX45. The group ID is set via 3 DIP switches on the rear panel (13), labelled 4, 2 and 1 (the number is set in binary by adding up the 4's, 2's and 1's, as shown opposite)

Paging any of the 5 zones from the CS-5 will only affect RX45 units with the same ID (for example, if three RX45 units are all set to ID 4 and zones 1 + 3 are paged on one of these units, the same zones 1 + 3 will be paged on the other two RX45s)

However, if TR86 remote wall plates (see below) are used with multiple RX45 units that are linked together in a cascade, each will only control the individual zones of the RX45 it is connected to and not affect any zones on other RX45 units.



## Operation

When all connections are made, ensure that amplifiers or speakers connected to the zones are turned down. Switch on POWER (1) to the RX45 and any further RX45 units that are linked in a cascade with it.

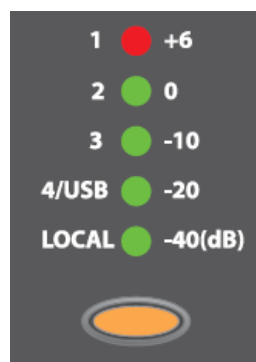
All channel LEDs will light, briefly showing the input sources (6), then change to VU meters for each zone.

Once the RX45 is powered up, turn up any connected amplifiers or speakers to a useful level for testing.

This can be increased later when the unit has already been checked.

Alternatively, the output of any selected zone can be checked through stereo headphones connected to the 3.5mm PHONES socket (8). Ensure the volume for this is turned down first, to avoid excessively loud output.

Ensure that the PAGE buttons are at the "out" position (3), which would otherwise override all other inputs.



Each channel has an illuminated button on the front panel and 5 LEDs above it. Pressing the button for any of the 5 zones will cause it to illuminate and assign it for editing.

The 5 indicator LEDs will briefly show the input source (1, 2, 3, 4/USB or LOCAL), then revert to acting as a VU level meter for that zone.

To select an audio source for a zone, press the zone select button to step through the input sources 1, 2, 3, 4/USB. Note: The input level of line inputs 1, 2, 3 can be adjusted on the rear panel with 3 miniature trim controls, which is useful for loud input sources.

Input 4/USB is for the internal media player. LOCAL is a line input wired into a TR86 wall plate (if this is used).

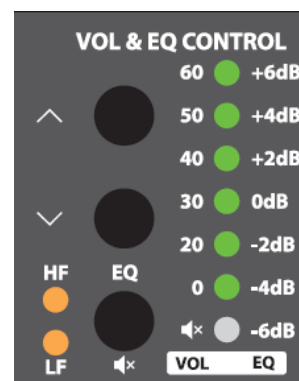
When a zone is selected, it can be edited in the master section on the right-side of the zone selectors. Pressing the  $\wedge$  button repeatedly will increase the output level on that zone and pressing  $\vee$  repeatedly will reduce the output level on that zone. This is indicated by the 6 LEDs in the master section.

EQ button has 2 functions. A brief press will mute the output of the selected zone.

Hold this button for 3 seconds and the master section will enter the EQ mode.

The HF LED will light, enabling 'treble' adjustment using the  $\wedge$  and  $\vee$  buttons.

Pressing EQ again will cause the LF LED to light and enable adjustment of 'bass' frequencies in the same way, using the  $\wedge$  and  $\vee$  buttons.

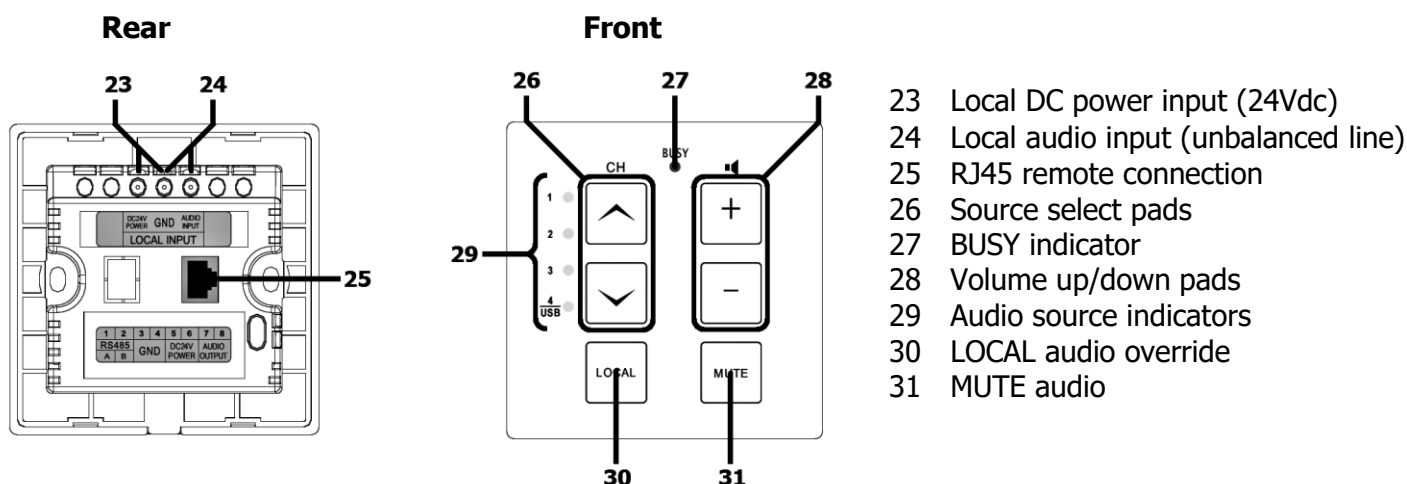


Pressing EQ again continually toggles between HF and LF, allowing repeated adjustments of treble and bass. Press and hold the EQ button for 3 seconds to exit the EQ menu.

## TR86 Remote Wall Plate

Each zone of the RX45 can be remotely controlled by a TR86 wall plate connected to the RJ45 sockets on the rear panel (11). TR86 wall plates are available to purchase separately (953.050UK) and are only needed for remotely controlled zones.

The TR86 is touch operated with a toughened clear acrylic surface, which is neat and hygienic, and is designed to fit into a standard single gang 86 x 86mm back box (35mm minimum depth)



Connect each TR86 via a network cable with RJ45 connection (25), which will require a gap to access from the rear of the back box. This will deliver power to the TR86 for up to 100m. For longer cable runs up to 1km, the TR86 will require separate local 24Vdc power supplied to the screw contacts at the rear (23)

Tapping the ^ and v 'CH' select pads (26) will step the audio source for the zone through 1, 2, 3 and 4/USB. (where 4/USB is the RX45 internal media player)

The active audio source is indicated by LEDs at the side of the CH select pads (29)

Tapping the LOCAL pad (30) enables the TR86 to provide an audio source for its own zone.

This is an optional mono line level signal (0.775Vrms @ 0dB) connected via terminals on the rear panel (24). Note that this shares the GROUND connection with the 24Vdc power input.

The local input source is line level and can be wired to a wall plate with an audio connector for AUX in.

Tapping the + and - pads (28) will increase or decrease the output volume of the zone in increments.

The HF (High Frequency or Treble) and LF (Low Frequency or Bass) EQ for a zone can only be edited from the from the onboard controls on the RX45. This feature is not available to adjust from the TR86 wall plate.

Tapping MUTE (31) will mute the output of any playback to the zone, although paging will still be available.

When the zone is paged from the RX45 MIC input or a call station, the BUSY LED will light (27).

When this LED is lit, playback sources will be muted until paging is deactivated on the MIC or call station. The same applies if the RX45 receives an emergency 24V trigger on the 24V MUTE contacts.

**Note:** Changes on the TR86 will be mimicked by the zone LEDs on the main RX45 unit. However, the TR86 does not continually follow manual changes on the front panel of the RX45, but the indicators can re-sync when the channel is operated from the TR86 again.

## System checking

To check outputs without powering up speakers, connect a set of stereo headphones to the PHONES output jack (8). Turn down the PHONES to a low level firstly for hearing safety and increase later if necessary. Speakers may be powered up for this instead, but it is advised to keep to lower levels for initial checking.

If a paging microphone is connected (2, 21), this can be used to check that there is output to all channels. Turn the paging microphone level down (4). Many paging microphones have their own paging button, which should be left switched on. Push in the PAGE button (3) and speak into the paging microphone, whilst gradually increasing the paging mic level as required. Check each zone in turn by pressing its select button (6)

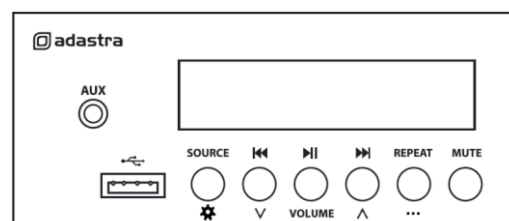
To check individual outputs to each zone in turn, make sure the PAGE button is at the "out" position and the MIC LED (5) is not lit. Whilst a signal is playing into one of the line inputs (18), press the zone selector button for each zone until that source is selected and ensure its volume is up part way for checking. If no sound is heard, check the level control for that line input is not turned fully down (17).

If there is no line input source available, the internal RX45 media player can be used for checking. Set the zones to "4/USB" and see the section below for operation of the media player.

If a CS-5 call station is connected to the RX45 (see below), it can address all or any of the 5 output zones from the keypad. Press the required zone button(s) followed by the large green talk button and speak into the CS-5 microphone.

## Media player

The RM120D mixer-amp is fitted with a built-in media player (1)  
The media player has a Bluetooth receiver, USB/SD audio player and a DAB+ or FM radio tuner. Pressing the SOURCE select button will step through Bluetooth, SD, USB, DAB and FM tuner modes. Pressing the MUTE button for any source will mute the output. Holding the MUTE button powers down the media player and pressing it again powers it up again.



## Settings menu

The media player has a menu for global settings, which can be accessed by holding down the SOURCE button. Press **⏪** and **⏩** to step through menu pages and **▶ ||** to select an option. Press REPEAT / ... to go back.

Setting	Press ▶	▶    to step through settings & enter / ⏪ and ⏩ to adjust values
<Time >	<Set Time/Date >	DD-MM-YYYY... HH:MM
	<Set 12/24 hour >	<Set 24 hour> / <Set 12 hour>
	<Set date format>	<DD-MM-YYYY> / <MM-DD-YYYY>
	<Auto update >	<Update from Any> / <No Update> / <Update from FM> / <Update from DAB >
<Backlight >	<Timeout >	< On / 10 / 20 / 30 / 45 / 60 / 90 / 120/ 180 > (seconds)
	<On level >	<Low> / <Medium> / <High> (brightness)
<Language >		<English> / <Deutsch> / <Italiano> / <Françes> / <Español> / <Português>
<Factory Reset >		<No> / <Yes> ("Yes" will reset and starts a re-scan for DAB) (Note: Bluetooth will need to be re-paired)
<SW version >		Displays the current software version

## Bluetooth

Search available Bluetooth devices on your smart phone or other sending device for a device with Bluetooth ID "adastra-\*\*\*\*" (where \*\*\*\* is a unique ID number for each unit). Select to pair and connect with this ID.

When paired and connected, set the volume low on the smart phone or other sending device and play a track to check the sound through the speakers, increasing the volume on the smart phone to the required level.

Playback controls on the media player can remotely operate the smart phone from the amplifier front panel. Pressing ▶ || will pause or play the current track, whilst holding ▶ || will disconnect the current paired device.

Pressing ◀◀ or ▶▶ will select the previous or next track. Holding ◀◀ or ▶▶ will decrease or increase the output volume.

Pressing the REPEAT / ... button will switch the display to show the current time or date on the lower text line.

If there is no Bluetooth playback for 15 minutes, the display will revert to show the current time and date.

## SD and USB audio player

The media player can play mp3 or wma files stored on a USB stick or SD card (formatted FAT32 or exFAT) Select SD or USB using the SOURCE button and insert the SD or USB storage device containing the tracks. The display will show the play status, USB or SD and repeat status on the upper text line.

Pressing ▶ || will pause or play the current track, whilst ◀◀ or ▶▶ will select the previous or next track. Holding the ◀◀ or ▶▶ button will decrease or increase the output volume of the media player.

The repeat mode can be set by holding the REPEAT/... button, pressing ▶ || , and selecting using ◀◀ or ▶▶. NR = Normal (no repeat), RA = Repeat All, R1 = Repeat One (current track), Rd = Random.

Pressing the REPEAT/... button selects the lower text line information, cycling through ID3 info, time & date. If there is no SD or USB playback for 15 minutes, the display will revert to show the current time and date.

## DAB tuner

The media player has a digital radio receiver which can decode the DAB/DAB+ signal for high quality radio reception.

To receive this signal, connect the DAB/FM Aerial 'F' connector on the rear panel (27) to an external or indoor active aerial that can receive the DAB/DAB+ frequency band (174-240MHz).

Press and hold the ▶ || button to initiate auto-tuning for the DAB radio tuner. The display will show "Scanning..." with a progress bar and the number of stations detected and stored.

The display will show the current station in the upper row of text and additional information on the lower row. Select the station to be played using the ◀◀ and ▶▶ buttons.

Pressing the REPEAT/... button will cycle the display to show additional tuning, audio information, current time or date. Holding this button opens a sub-menu for the FM tuner.

<b>Setting</b>	Press ▶    then use ◀◀ and ▶▶ to step through settings and ▶    again to select.
<Full scan >	Press ▶    to scan and store all available stations
<Preset Recall>	Select a stored station (use ◀◀ and ▶▶ to select 1-30)
<Preset Store >	Select a memory slot (use ◀◀ and ▶▶ to select 1-30) and press ▶    to save to that slot
<Manual tune >	Use ◀◀ and ▶▶ to step through DAB frequency band
<Prune >	<No> / <Yes> (removes any redundant stations from memory)
<DRC >	<off> / <low> / <high> setting for dynamic range compression (loud vs quiet balance)



## FM Tuner

The FM tuner function operates in the same way as a standard FM radio and benefits from the connection of an FM antenna to the rear panel 'F' type connector.

If no channels are tuned in, press the Play/Pause ► || button to begin auto tuning, which scans available stations and stores them as channels within the FM tuner. Pressing Play/Pause again will abort auto-tuning.

To delete any selected station, press and hold the REPEAT button. Repeat the auto tuning process to re-populate any missing presets.

To step through pre-set stations, press the Previous ◀◀ or Next ▶▶ buttons. Turn up the MEDIA volume control to hear the output from the speakers and increase to the required level.

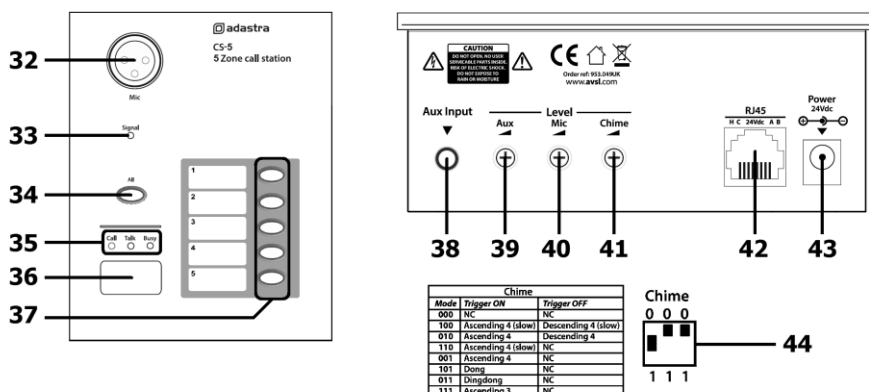
Setting	Press ►
<Preset Recall>	Select a stored station (use ◀◀ and ▶▶ to select 1-30)
<Preset Store>	Select a memory slot (use ◀◀ and ▶▶ to select 1-30) and press ►    to save to that slot
<Scan Setting>	<All stations> / <Strong station> (only stores stations with a strong signal)
<Audio Setting>	<Stereo allowed> / <Forced mono>

Holding the Previous ◀◀ or Next ▶▶ buttons will adjust the output volume of the player.

Pressing the REPEAT/... button will cycle the display to show additional tuning, audio information, current time or date. Holding this button opens a sub-menu for the FM tuner.

## CS-5 call station (optional)

For independent paging to any combination of zones from a remote location, an optional CS-5 call station is available (953.049UK). The CS-5 connects to the RX45 rear panel via network cable in a similar way to the TR86 remote controls. As mentioned in the "Call station" section above, this is governed by the ID setting.



Connect the CS-5 call station via network cable (42) to the RX45 before the system is powered up to avoid damage to the system. As with the TR86 remote, the CS-5 call station requires a separate 24Vdc power supply if the network cable run is longer than 100m. This can enable the CS-5 call station to operate up to 1km away from the main RX45 unit when 24Vdc power is supplied to it (43)

Connect the CS-5 gooseneck microphone to the base unit, ensuring that it is secured and properly connected (32) before powering up.

The underside of the CS-5 base unit has 3 DIP switches (44) for setting the internal chime that is activated when a call is made. There is a 3.5mm AUX input on the rear of the CS-5 base unit with a dedicated volume control. Connect a line level audio source, such as smart phone or laptop, to play back recorded audio messages or music to paged zones. Also on the rear of the base unit are volume controls for the call station microphone and internal chime.

Once all connections are made, power up the RX45 system and then any connected equipment and set volume levels as required.

To call any combination of zones from the CS-5, select the zones on the zone select buttons (37) and the relevant LEDs will light. An "ALL" button is provided as a quick way of selecting all zones together (34)

When the required zones are selected, press the call button (36) and if a chime is set, this will be played to the selected zones. The CS-5 microphone will now be live to these zones and each zone will show "BUSY" on its TR86 remote and its audio will be muted. The call status is confirmed by LED indicators above the call button (35)

Pressing the Page button again will deactivate the microphone and all zones will be reset back to their previous settings.

## Specifications – RX45 main unit

Power supply	100-250Vac, 50/60Hz (IEC lead included)
Fuse	T1AL
Audio source	USB/DAB+/Bluetooth audio player
Bluetooth version	5.0
Inputs	Paging mic. (XLR), 3 x stereo line (RCA) + call station (RJ45)
Microphone: input sensitivity	-41dBV
Line input: sensitivity	-12.5dBV
Call station input: sensitivity	+4dBV
Emergency control	24V mute contacts and emergency audio input
EMG input: sensitivity	-10dBV
Signal to noise ratio: mic	65dB
Signal to noise ratio: line	73dB
Outputs	5 x stereo zones (RCA)
Output impedance: line	600 ohms
THD +N	<0.1% @ 1kHz
Monitor outputs	Stereo 3.5mm headphone jack (selected channel)
Phantom power	+24V switchable for paging mic.
Remote control connection	8P8C (RJ45)
Link connection	2 x 8P8C (RJ45)
Frequency response: ±3dB	20Hz - 20kHz
Attenuation	-30dB (paging)
Dimensions	44 x 190 x 483mm
Weight	2.608kg

## Specifications – Optional TR86 Remote

Power supply	24Vdc (from RJ45 connector or separate 24Vdc adaptor)
Max. connection length	100m (network cable) or 1km with optional 24Vdc adaptor
Connection	8P8C (RJ45)
Terminals	Local +24V, Ground, Local line input
Controls	Sources 1-4 (USB), Local, Mute, Level +/-
Mounting depth	38mm
Dimensions	86 x 86 x 38mm
Weight	128g

## Specifications – Optional CS-5 Call Station

Power supply	24Vdc, 500mA (from RJ45 connector or separate 24Vdc adaptor)
Max. connection length	100m (network cable) or 1km with optional 24Vdc adaptor
Capsule	Back electret condenser
Polar pattern	Cardioid
Controls	Aux/Mic/Chime levels, chime DIP switches, zone/call/reset buttons
Connectors	RJ45 (8P8C) to RX45, 24Vdc power jack, 3.5mm aux in
Frequency response: -3dB	150Hz - 22kHz
Input level	Mic: -46dBV, Aux: -10dBV
Input impedance	Mic: 600 Ohms, Aux: 50k Ohms
Output level	10dBV
Output impedance: balanced	600 Ohms
S/N ratio	-60dB (all channels selected)
Interface	RS-485 control
Zone assign	5 zones individually or All zones selectable
Dimensions	460 x 140 x 115mm
Weight	670g



**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.

Hereby, AVSL Group Ltd. declares that the radio equipment type 953.046UK is in compliance with [Directive 2014/53/EU](#)

The full text of the EU declaration of conformity for 953.046UK is available at the following internet address:  
<http://www.avsl.com/assets/exportdoc/9/5/953046UK%20CE.pdf>

*Errors and omissions excepted. Copyright© 2024.*  
 AVSL Group Ltd. Unit 2-4 Bridgewater Park, Taylor Rd. Manchester. M41 7JQ  
 AVSL (EUROPE) Ltd, Unit 3D North Point House, North Point Business Park, New Mallow Road, Cork, Ireland.