



# Audio for Education

An Installer's Guide



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## An Installer's Guide

### Welcome to the installer's guide to Audio for Education

Created to give you a brief overview of the different applications commonly found in education, this guide will arm you with some key questions to help specify a solution that not only meets your clients' specification and budget, but also help you attract more opportunity to tender for spaces that would otherwise be overlooked.

We have selected handful of applications commonly found in education facilities; simple classroom presentation, room zoning audio systems, paging systems, stage performance and outdoor portable PA. The applications found in this document are relevant to facilities of all sizes; nurseries, schools, colleges and universities.

If you have any questions or would like more information regarding anything in this booklet please call us on 01525 850085 or email [sales@leisuretec.co.uk](mailto:sales@leisuretec.co.uk).

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## Recommended

- ◇ Single-Zone Mixer Amp
- ◇ Surface / Ceiling Mount Speakers

## Optional

- ◇ Radio Mic System
- ◇ Volume / Source Plate
- ◇ Boundary Mics (for video conferencing)
- ◇ Media Sources
- ◇ Assistive Listening

## Application 1

# Single-Zone Classroom or Meeting Room

A standard size, general use classroom for groups of 20-30 students (e.g. 55m<sup>2</sup>). These types of spaces will commonly be used for teaching academic subjects such as Maths, English, History etc. which may require media playback for students.

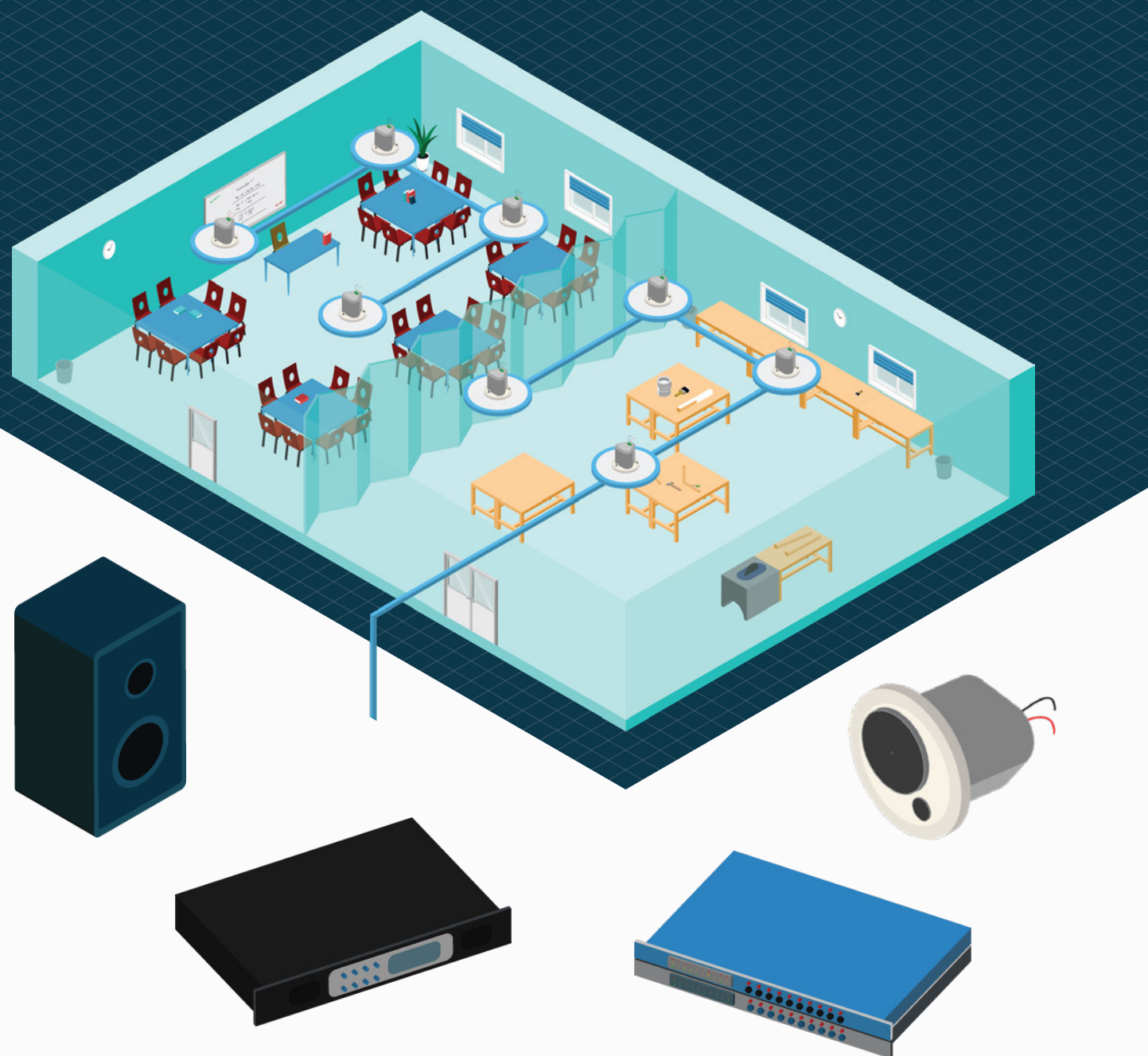
Depending on the layout and size of the room, surface mount or ceiling speakers can be installed to provide clear sound throughout the space. A single zone mixer amplifier will provide sufficient power and control for an application of this size; 100V line amplifiers will give you the freedom to easily install and scale the number of speakers required.

Small meeting rooms may also require additional equipment such as ceiling or desktop microphones to complement video conferencing systems. See page 22 for more info on the Sennheiser TeamConnect Ceiling 2 microphone.

## Key Questions:

- ◇ What size is the room?
- ◇ What is the space typically used for?
- ◇ How many inputs are required (mics / media sources)?
- ◇ Is a microphone required (handheld, headset etc.)?
- ◇ Is a line out required for assistive listening?
- ◇ Does the space allow for wall or ceiling speakers?

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## Recommended

- ◇ Multi-Zone Mixer Amplifier   ◇ Surface / Ceiling Mount   ◇ Power Amplifier
- ◇ Multi-Zone Mixer                      Speakers

## Optional

- ◇ Radio Mic System                      ◇ Volume / Source Plate
- ◇ Media Sources                          ◇ Assistive Listening

## Application 2

# Multi-Zone Classroom with Divider

A large classroom or practical learning area with temporary dividing wall which creates two zoned spaces for groups of 20-30 students per zone (e.g. 100m<sup>2</sup> total). In this example, one zone is being used as a standard classroom and the other as a woodworking class.

Audio output to both zones is controlled independently via a multi-zone-mixer amplifier or with a multi-zone-mixer and separate amplifier. Using a separate mixer and amplifier gives greater flexibility when designing the speaker system by matching the amp power to the required speakers instead of compromising the speakers to match a mixer amplifier.

For environments with moderate to high humidity or particulate levels (e.g. swimming pools), IP rated speakers should be considered to ensure longevity. IP ratings represent the level of protection provided against potentially harmful substances with the first number classifying protection against solid objects and the second against moisture (e.g. IP65). The higher the number, the higher the resistance to damage.

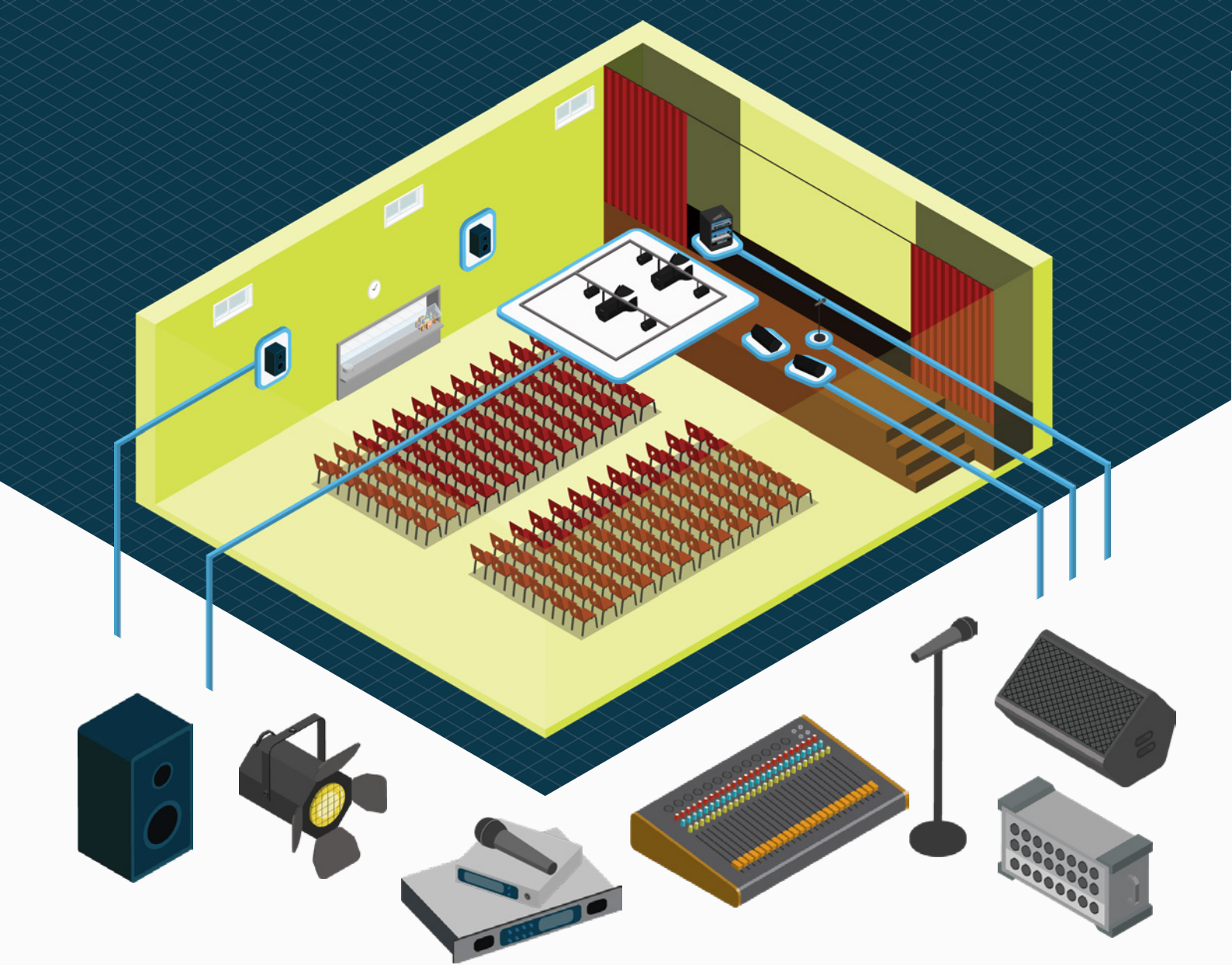
[International Electrotechnical Commission (2020)]

## Key Questions:

- ◇ How many zones need to be covered?
- ◇ What size is each zone?
- ◇ What is each space typically used for?
- ◇ How many inputs are required (mics / media sources)?
- ◇ Is a microphone required (handheld, headset etc.)?
- ◇ Is a line out required for assistive listening?
- ◇ Does the space allow for wall or ceiling speakers?
- ◇ Does the environment require IP rated equipment?

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### Recommended: Simple System

- ◇ Single-Zone Mixer
- ◇ Point-Source PA Speakers
- ◇ Radio Mic System
- ◇ Amplifier
- ◇ Speaker Brackets

### Recommended: Complex System

- ◇ Line-Array / Point-Source PA Speakers
- ◇ Desktop Mixer
- ◇ Wireless In-Ear Monitoring
- ◇ Floor Monitor Speakers
- ◇ Stagebox
- ◇ Aerial Distribution
- ◇ Speaker Rigging & Brackets
- ◇ Amplifier
- ◇ Wired Mics & Stands
- ◇ Radio Mic System(s)

### Optional

- ◇ Theatrical Lighting
- ◇ Active Portable PA
- ◇ Media Sources

## Application 3

# Main Assembly Hall

Main halls are typically multi-purpose spaces used for anything from assemblies and performances to sports and events. Halls are often upward of 150m<sup>2</sup> with space for hundreds of students, staff and guests at once.

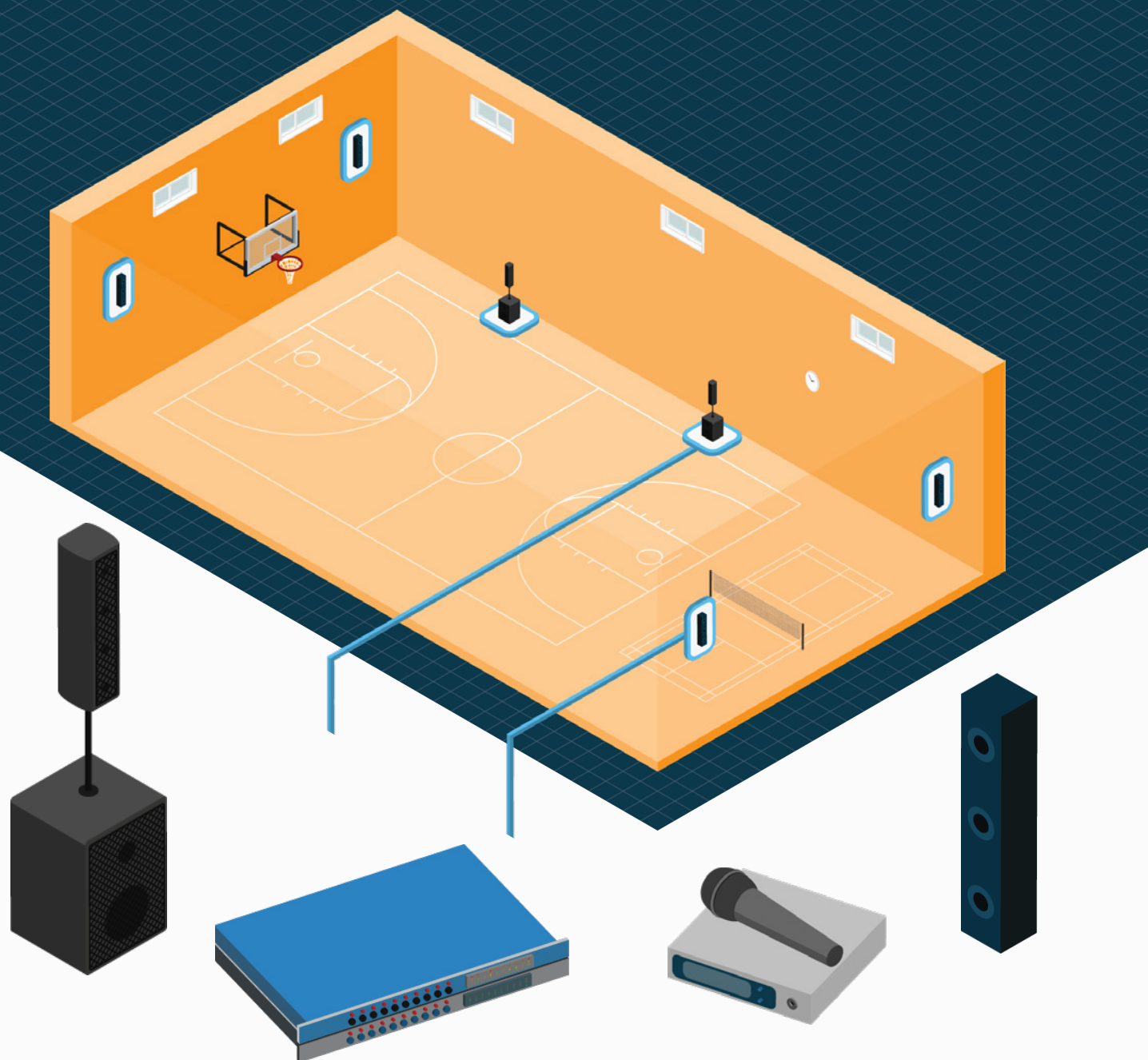
For a simple system, passive point-source PA speakers, a powerful amplifier and a single zone mixer will provide all round functionality without the need for additional power infrastructure for individual speakers. For complex setups a desk mixer, amplifier and one or more stage boxes will provide multiple levels of independent creative control for any application with line-array, point-source or a combination of the two providing ample throw to fill larger spaces. Stage monitor speakers can also be added to provide presenters / performers with live monitoring. In both cases, main halls are typically treated as single zone spaces.

The choice of radio mics and in-ear-monitoring systems depends largely on the project. For small facilities which require only a few radio systems, digital and channel 70 could suffice; for larger setups it may be necessary to invest in channel 38 (Ofcom licence required) or 1.8GHz to ensure a stable, scalable system and avoid interference.

### Key Questions:

- ◇ What is the physical size of the room?
- ◇ What are the acoustic properties of the space?
- ◇ What will the space be used for? (exams, dinners, sports, events, performances)
- ◇ How many inputs are required (mics / media sources)?
- ◇ How many radio / wired microphones are required?
- ◇ Is there a Front of House or any additional overflow areas to consider?
- ◇ Does the space require assistive listening solutions?
- ◇ Does the space require theatrical lighting? (Contact our team to find out more)

**Call 01525 850085 to discuss your requirements**



## Recommended

- ◇ Single-Zone Mixer
- ◇ Power Amplifier
- ◇ Speaker Brackets
- ◇ Radio Microphone System
- ◇ Surface Mount PA Speakers

## Optional

- ◇ Media Sources
- ◇ Active Portable PA Speakers

## Application 4

# Sports Hall

Large open spaces equipped for regular sporting activities, lessons and events. Typically similar in size if not smaller than a main assembly hall (e.g.  $\leq 150m^2$ ), sports halls typically require only simple audio systems for musical and vocal reinforcement.

For this example, a single-zone mixer, an amplifier and passive point-source PA can be implemented for a simple, low-key approach that can be controlled and maintained easily for various activities. Passive speakers are generally more cost effective than active speakers as they eliminate the need for additional power infrastructure and cost less to maintain / replace if damaged during sporting activities. Portable active speakers can also be used for smaller more focused activities and easily stored away when not in use.

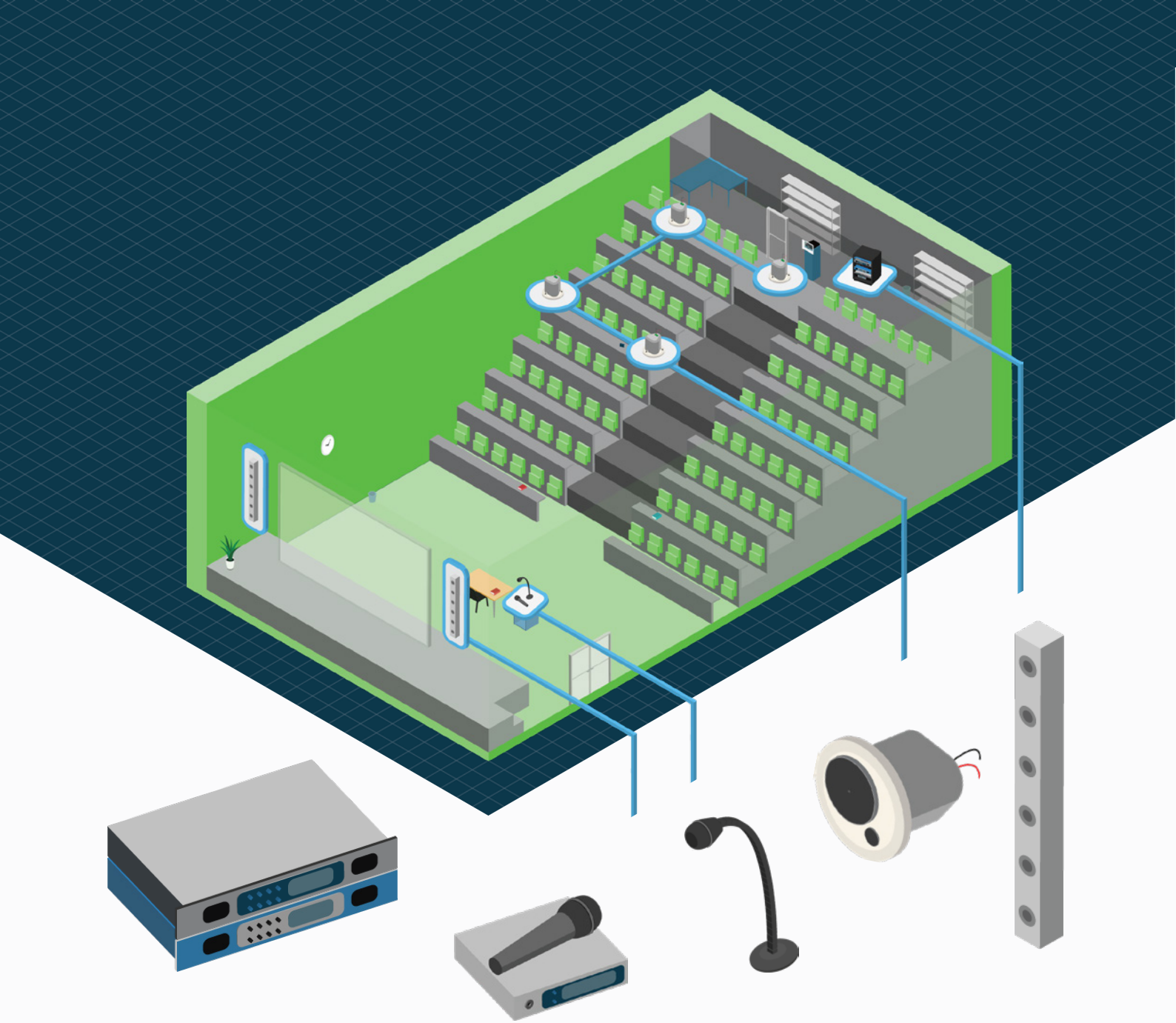
A further consideration for sports halls would be access to a portable PA solution for small group activities where immediate local control over input and output would be beneficial (see page 17 for more info).

## Key Questions:

- ◇ What is the physical size of the room?
- ◇ What are the acoustic properties of the space?
- ◇ What will the space be used for? (exams, dinners, sports, am-dram, awards nights, assembly's, discos)
- ◇ How many inputs are required (mics / media sources)?
- ◇ How many radio / wired microphones are required?
- ◇ Are there any additional overflow areas to consider?
- ◇ Does the space require assistive listening solutions?
- ◇ Are active portable speakers required for in / outdoor activities? (see page ##)

**Call 01525 850085 to discuss your requirements**





## Recommended

- ◇ Multi-Zone-Mixer
- ◇ Amplifier(s)
- ◇ Ceiling or Wall Speakers
- ◇ Point Source / Line-Array /
- ◇ Column Speakers
- ◇ Radio Mic Systems
- ◇ Gooseneck Mic

## Optional

- ◇ Lectern
- ◇ Lectern Microphone
- ◇ Media Sources
- ◇ Assistive Listening
- ◇ Volume / Source Plate

## Application 5

# Auditorium / Lecture Theatre

Multi-purpose learning spaces with raised seating for students, and an open floor and or stage area with multi-media and presentation facilities.

Lecture theatres and auditoriums can be treated as a 2-zone system. Wall-mount / ceiling mount PA speakers around the raised seating area and column and wall-mount or line-array speakers placed on the left and right of a screen, stage or centre focal point provide audio throughout the space. Input and output can then be controlled via a 2-zone mixer with one or more amplifiers providing 100V or low impedance power.

Radio microphones will be required for spaces where lecturers, performers, presenters and other participants need added vocal reinforcement and the freedom to move around the space. Radio or wired microphones can also be used for fixed positions such as desktops and lecterns.

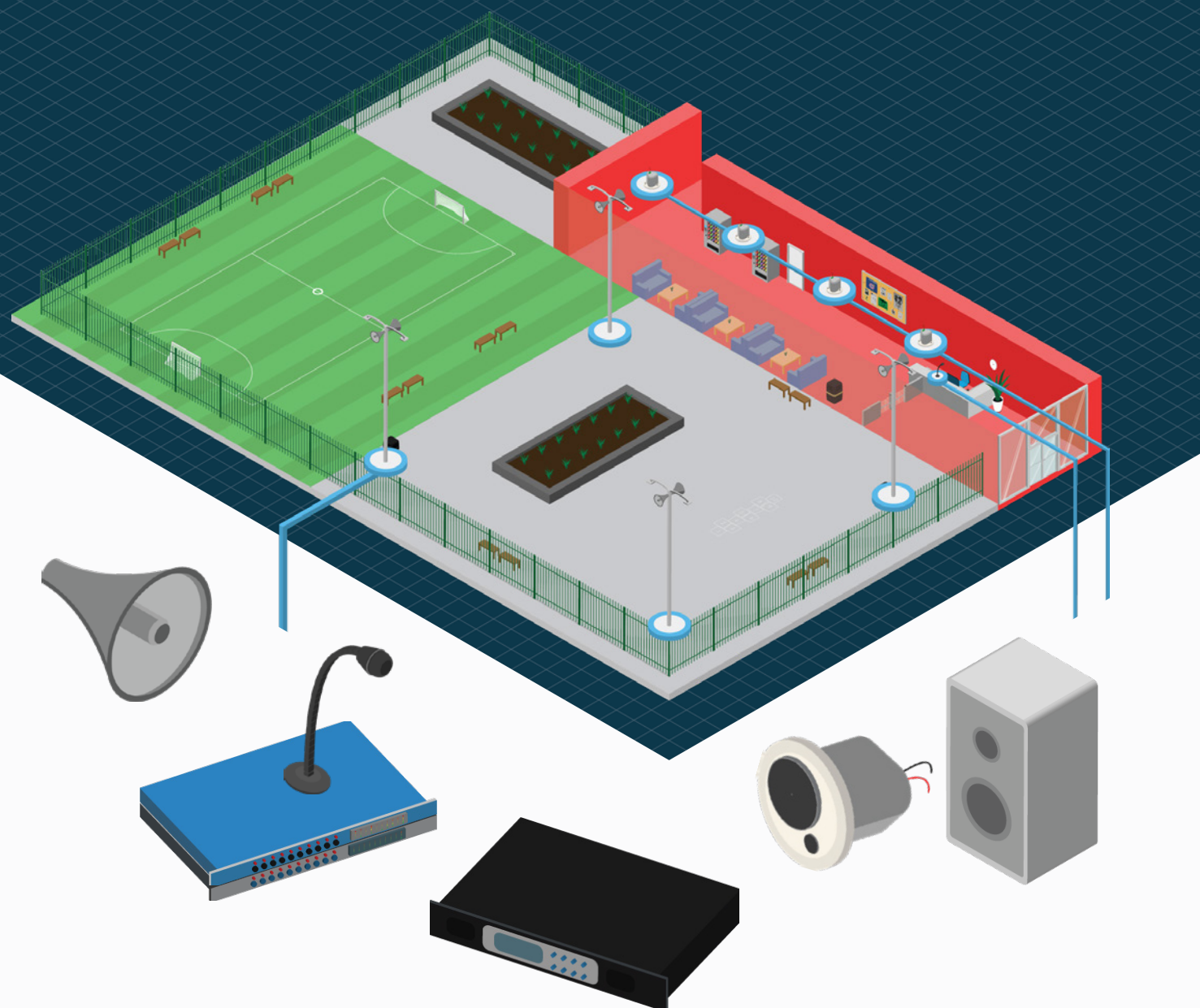
*A study into lecture theatre environments showed 78% of students felt the quality of a lecture theatre affected the learning experience with the quality of AV equipment ranking highest among complaints.*

[Cite (Fleming, D. and Storr, J. 1999, p. 231-236)]

## Key Questions:

- ◇ What is the physical size of the room?
- ◇ What are the acoustic properties of the space?
- ◇ What will the space be used for? (Q&As, presentation, lectures, education, debates)
- ◇ How many mics will be required?
- ◇ Does the space require mics to be permanently installed?
- ◇ Is there an existing assistive listening system in place?
- ◇ Does the space require theatrical lighting?

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## Recommended

- ◇ Paging Microphone
- ◇ Multi-Zone Mixer Amplifier
- ◇ Multi-Zone Mixer and Multi-channel Amp
- ◇ Low Power Surface / Ceiling Mount Speakers (BS EN 54)

## Optional

- ◇ Pre-recorded announcement system
- ◇ Media Sources

## Application 6

# Paging and Announcement Systems

Paging systems are used to make contact with students and staff across areas such as corridors, common rooms, utility areas and outdoor spaces; sharing news, pre-programmed chimes and bells and preparing for emergencies with alarms and safety announcements.

By combining low power wall / ceiling mount speakers with a multi-zone mixer amplifier (or a multi-zone mixer and one or more amp), a simple, cost-effective system can be controlled from a central hub with a paging mic for announcements. Pre-recorded announcement systems can also be used to provide fire safety and scheduled messages and chimes.

Voice over IP (VoIP), Audio over IP (AoIP) and Dante platforms provide simple, scalable and flexible networking for complex multi-zone installations of any size. Get in touch with our technical team to find out more and discuss your projects.

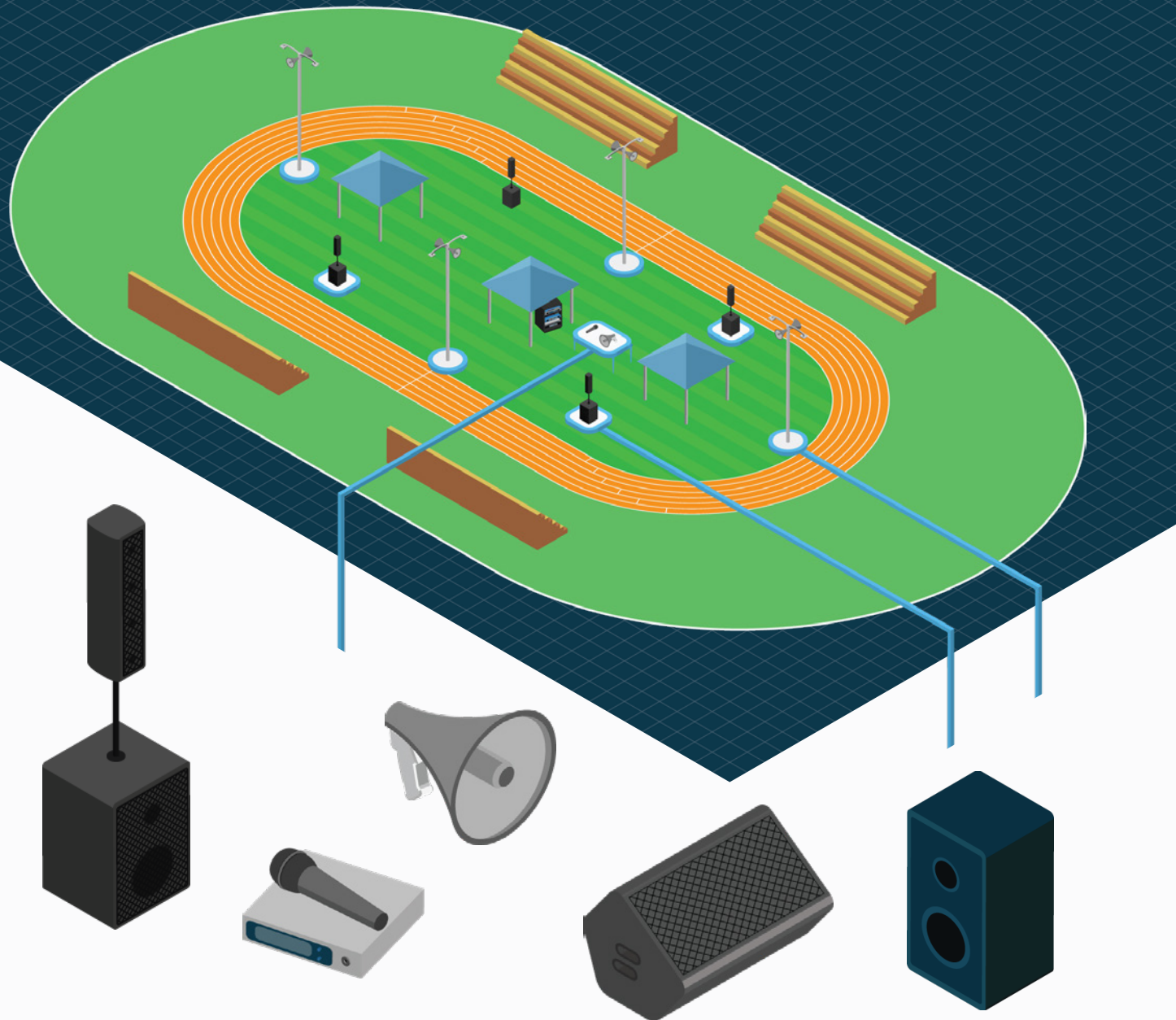
For essential fire and evacuation systems, all equipment should be BS EN 54 compliant (<https://www.bsigroup.com/en-GB/>). BS EN 54 outlines the specifications required for voice alarm equipment including minimum requirements for performance, reliability and robustness.

## Key Questions:

- ◇ How many zones are there and what is the size of each space?
- ◇ Do any of the spaces require IP rated systems?
- ◇ Does the facility require EN54 fire safety systems?
- ◇ Does it need to be Voice Evacuation certified?

**Call 01525 850085 to discuss your requirements**





## Key Questions:

- ◇ What applications will the PA be used for? (voice reproduction, public address, musical performance etc.)
- ◇ Does the client require a battery-operated solution?
- ◇ Does the application require wireless control / operation?
- ◇ What is the maximum size space the system will be required to fill?
- ◇ What environments will the PA be used in? (IP rated products available for outdoor use)
- ◇ What type audio connectivity is required? (Bluetooth, XLR, wireless mic systems etc.)

## Application 7

# Portable PA Speakers

### Active Portable PA

We have a wide range of flexible, compact and portable active PA solutions with full range sound and instant connectivity to suit any small to medium size application.

### All-in-One

For the ultimate set up and go, EVOX, EVOLVE and EON ONE array systems can be set up in minutes as an all-round active live sound PA for vocal reinforcement, live music and sports events. All of these products have built-in amplifiers with selected models also featuring mixers and advanced control functionality.

### Bluetooth and Wireless

Cut down on cables or go completely wireless with Bluetooth and battery-operated active PA solutions; ideal for spontaneous performances, outdoor learning and general sound reinforcement.

### Megaphones

Megaphones are portable, battery operated and easy to use for public address and announcements during sports days or large events where other PA solutions would be impractical.

Call 01525 850085 to discuss your requirements



## Key Questions:

- ◇ What will the space be used for?
- ◇ What is the size of the space?
- ◇ Is the space open with clear line of sight?
- ◇ Metal floors and ceilings can disrupt loop systems; what construction materials have been used in the space?
- ◇ How many people are likely to use the system at any one time?
- ◇ Will the system need to be active at all times?
- ◇ Will loops be installed in adjacent rooms (next to, above, below)?

## Application 8

# Assistive Listening

All educational facilities are legally required to provide assisted listening solutions for their staff and students to ensure no one is held back by their disability (SigNET AC, 2018). Why not take the opportunity to win some extra tender from your education install project by specifying a hearing loop or infra-red system?

## Hearing Loops

Compact, affordable and perfect for classrooms, lecture theatres, office spaces and reception areas, hearing loop systems deliver clear audio to compatible hearing aid devices. One of the main benefits of hearing loops is ability for users to tap into the audio output without requiring additional equipment, or needing to ask for help which can draw unwanted attention to a disability.

Hearing loops can be installed into almost any space or environment; single loops, counter top and portable systems are ideal for small spaces such as reception areas, classrooms and serving counters, while multi-loop systems and phased arrays can be implemented to cover larger areas and or decrease signal spill outside of private areas such as meeting rooms and offices.

## Infra-Red Solutions

IR systems offer a flexible and cost-effective alternative for areas where hearing loops cannot be installed. However, since users must be given a physical receiver to wear, IR systems are less inconspicuous than hearing loop systems and all equipment must be used within line of sight.

## Hanging & Boundary Microphones

Take your assisted listening solution one step further; bring your audience closer to the speaker with our range of professional hanging and desktop boundary mics. Available in a range of colours and pick up patterns to suit any type of acoustical environment.

Call 01525 850085 to discuss your requirements





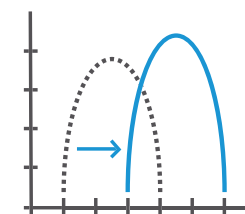
# SpeechLine Digital Wireless

## Dedicated to speech

Licence-free and widely scalable with a range of components from goosenecks to handhelds, SpeechLine Digital Wireless answers all the needs of an everyday learning environment - from small room setups to huge campus-wide installations.

### Key Features

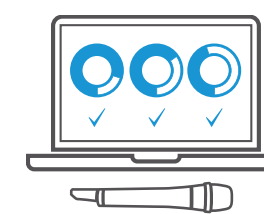
Auto Frequency Management • Optional Dante Interface • Use up to 20 Channels at Once • Licence Free 1.9GHz • 256-bit Encryption • Auto Interference Management



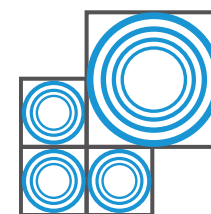
Automatic Frequency Management



Automatic Interference Management



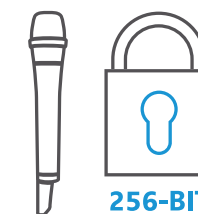
Software Based Status Monitoring



Multi-Room Mode

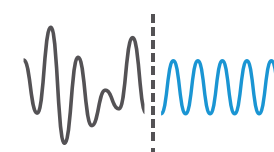


Dante™ Interface

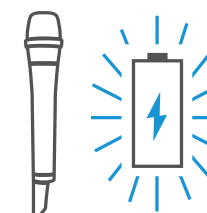


256-BIT

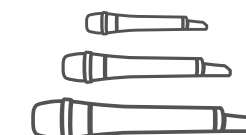
Advanced 256-bit AES Encryption



Automatic Audio Level Management



Convenient Recharging



UP TO 20

Multichannel Operation



Optimum Speech



License-Free



Future-proof 1.9 GHz

Call 01525 850085 to discuss your requirements

## TeamConnect Ceiling Mic 2

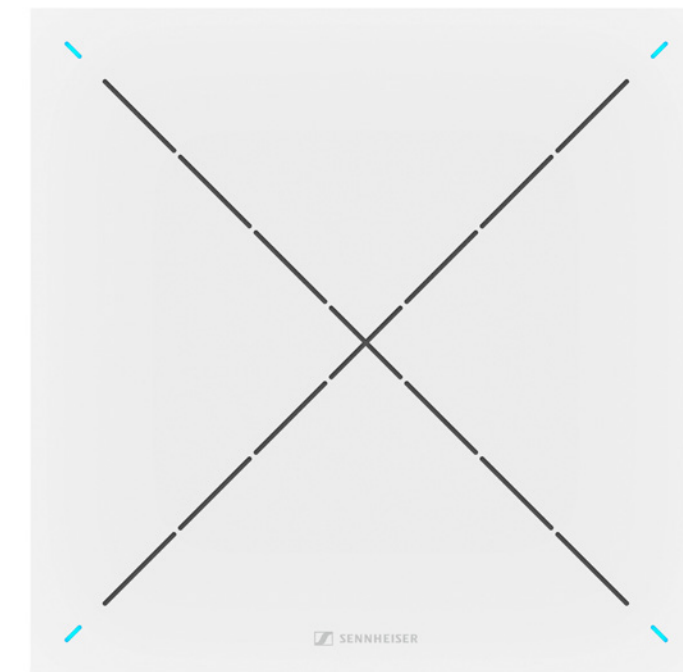
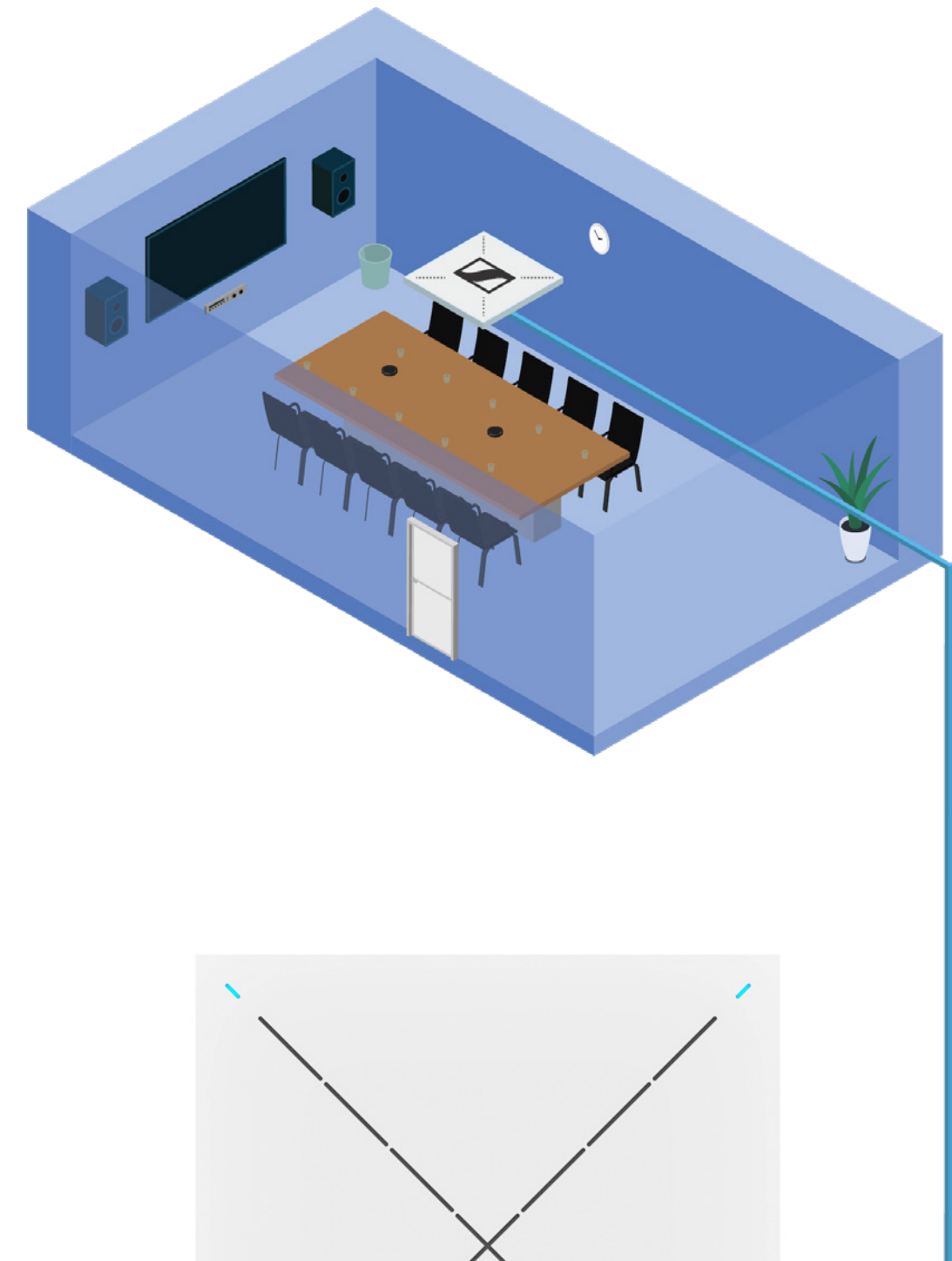
**Raise your meetings to a higher level**

TeamConnect Ceiling 2 is the ultimate hands-free, intelligent microphone for meeting rooms and learning spaces. Combining 28 individual capsules with patented beamforming technology, TeamConnect Ceiling 2 automatically focuses on the active speaker in the room, eliminating the need for desktop or hand held mics and freeing participants to focus on the meeting at hand.

Fully compatible with Control Cockpit with power over Ethernet (PoE), API and Dante™ compatibility, TeamConnect Ceiling 2 seamlessly integrates into existing infrastructure with multiple mounting solutions available to suit almost any space.



Call 01525 850085 to discuss your requirements





# Audio Brands

## Our audio brands related to this booklet

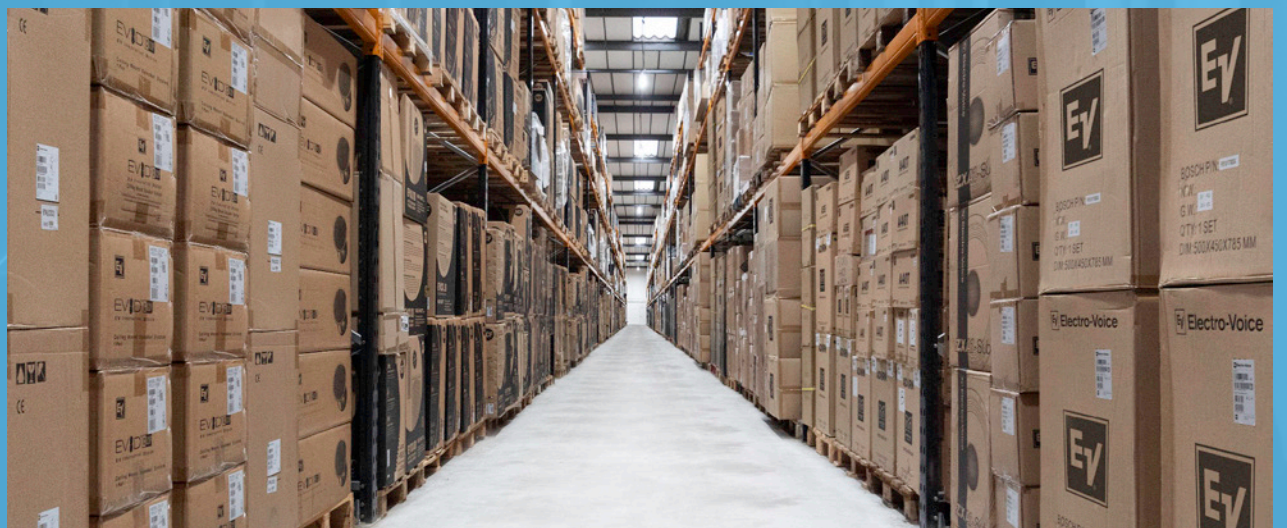
We sell an expansive portfolio of audio brands for live sound, AV installation, studio and broadcast. Extensive stock holding across our vast choice of products and brands means we can we'll always have a solution suitable to your specification and budget. Below is a handful of audio brands we have carefully selected to work seamlessly in the applications listed in this booklet, find our full list of brands at [www.leisuretec.co.uk/brand](http://www.leisuretec.co.uk/brand).



# Lighting Brands

## Your client wants lighting? No problem.

We also specialise in entertainment and architectural lighting solutions and distribute a strong portfolio of high-quality products from some of the industry's leading brands. The world of lighting can be very daunting at first but it's often a lot simpler that it looks. If you're new to lighting but want to explore the opportunity and try winning some extra sales revenue with your client, contact our team on 01525 850085 to discuss your requirements and we can point you in the right direction.

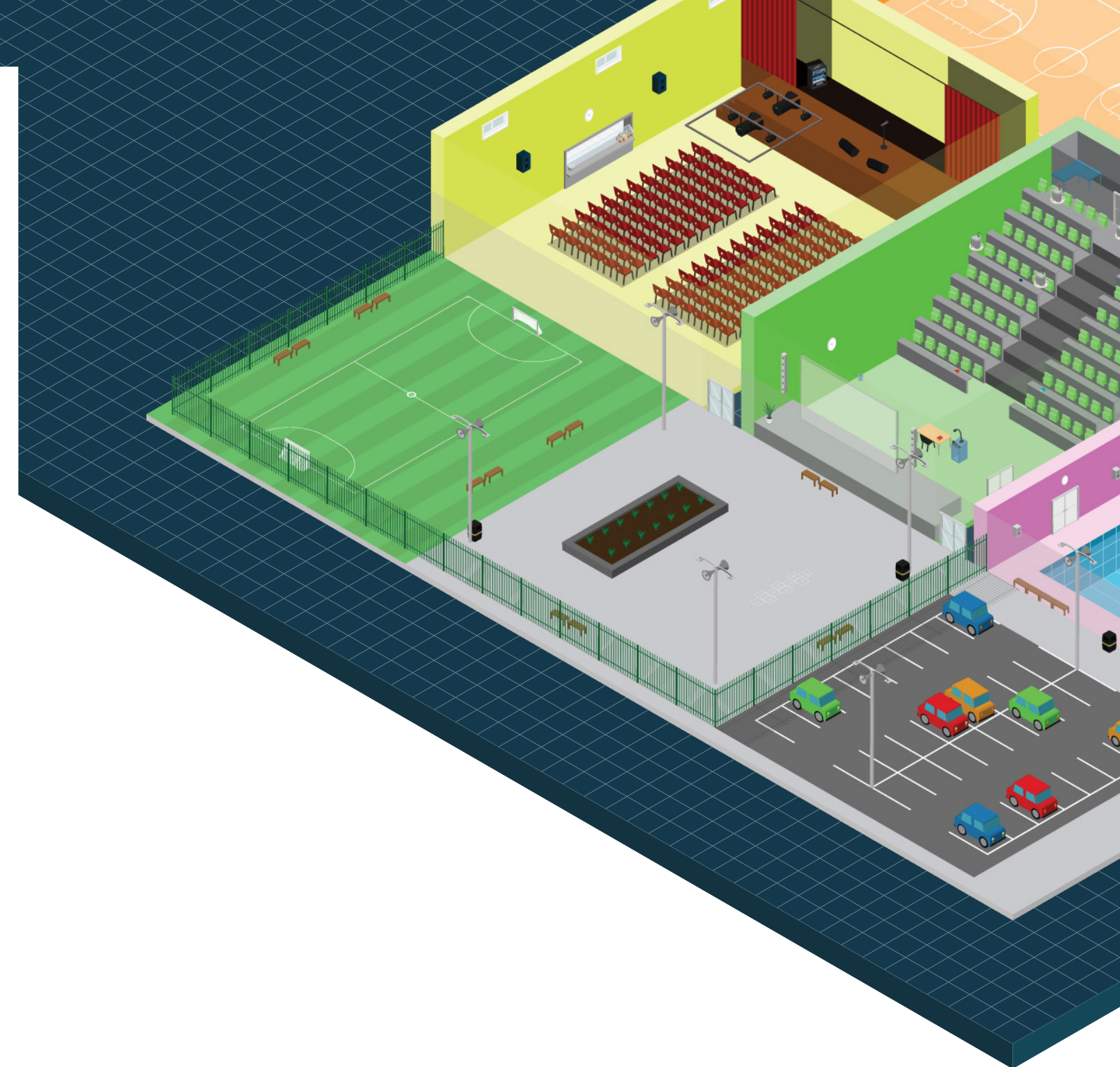


Visit <https://www.leisuretec.co.uk/brand> for a full list of brands we distribute.



# References

- ◇ Fleming, D. and Storr, J. (1999), "The impact of lecture theatre design on learning experience", Facilities, Vol. 17 No. 7/8, pp. 231-236.
- ◇ Keeping your phone clean can protect against COVID-19. (2020, March 30). <https://blog.iec.ch/2020/03/keeping-your-phone-clean-can-protect-against-covid-19/>
- ◇ SigNET AC. (2018). Hearing Loop Guide [E-book]. SigNET AC. <https://signet-ac.co.uk/wp-content/uploads/2018/01/Signet-loop-guide-2018-inside-for-web.pdf>
- ◇ Space requirements in classrooms. (2019, January 11). National Education Union. <https://neu.org.uk/advice/space-requirements-classrooms>
- ◇ The British Standards Institute Group (<https://www.bsigroup.com/en-GB/>)



## About this booklet

This booklet is intended as a guide only and should not be used as a technical support document for any products mentioned therein. For exclusive trade pricing and technical support on your projects please contact our team on 01525 850085 or email [sales@leisuretec.co.uk](mailto:sales@leisuretec.co.uk).

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