

Government and Justice

Hearing loops
application Guide



Listen to the difference

Contents

- 04.** Ampetronic™ hearing loops
- 06.** Hearing, Induction and T-Loops
- 08.** Chambers and courtrooms
- 10.** Public offices, side rooms and meeting rooms
- 12.** Complex and multipurpose rooms
- 14.** Secure areas
- 15.** Reception areas and service points
- 16.** Intercoms (Door entry, access points and entry barriers)
- 17.** Lifts and elevators
- 18.** Summary table
- 19.** Signage
- 20.** System design support and Training
- 22.** Accessories, receivers and measurement systems

Loops shown in this document are indicative only and not to scale. They are not for use in system design. For detailed designs please contact our friendly and knowledgeable team on +44 (0) 1636 610062 or email sales@ampetronic.co

The image shows the interior of a grand legislative chamber, likely the Texas State Capitol. The room features a large, ornate dome with a central skylight and intricate gold-colored decorations. The walls are adorned with a large, central relief sculpture depicting a figure with a halo, surrounded by other figures. The floor is covered in green carpeting, and the seating area is filled with rows of wooden desks and chairs, each equipped with a small electronic device. The overall atmosphere is one of historical grandeur and formal elegance.

AMPETRONIC

Listen to the difference

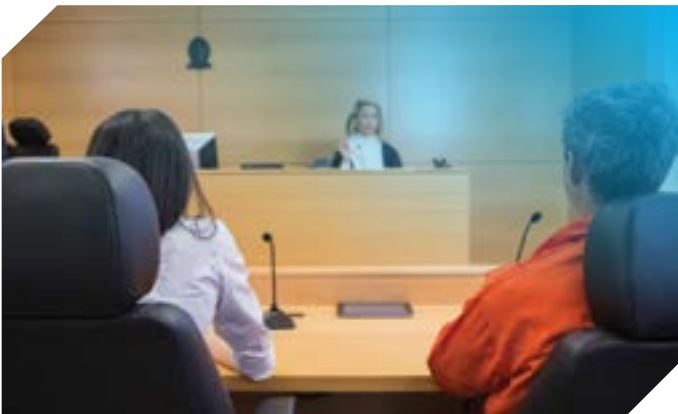
Ampetronic™ Hearing Loops



- Communicate directly with hearing aid users
- Support inclusion and enable participation
- Minimise uncontrolled information sharing

A significant proportion of the population have paid to be able to use assistive listening technologies; some of which hold roles in government, the legal profession or access these areas as members of the public. Hearing aid users deserve to have their commitment matched and their inclusion and participation in proceedings guaranteed.

Most hearing aid users would say that when they use their aids in one to one conversations they work very well. Difficulties arise when the level of ambient noise is too great or the distance between the talker and listener is increased as in a meeting chamber or courtroom.



The problems are exacerbated if the assistive listening system in use has been poorly specified or installed, particularly...

- when there are large and complex room structures
- when multipurpose rooms are in use e.g. partitioned meeting rooms
- where overspill can cause interference or broadcast of the signal
- when metal is present in the building structure or room contents

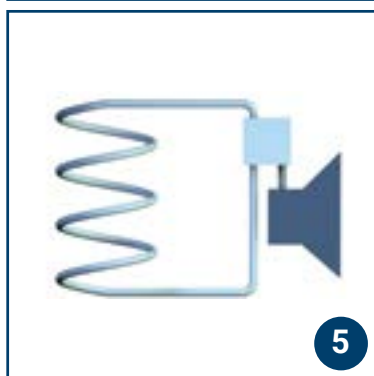
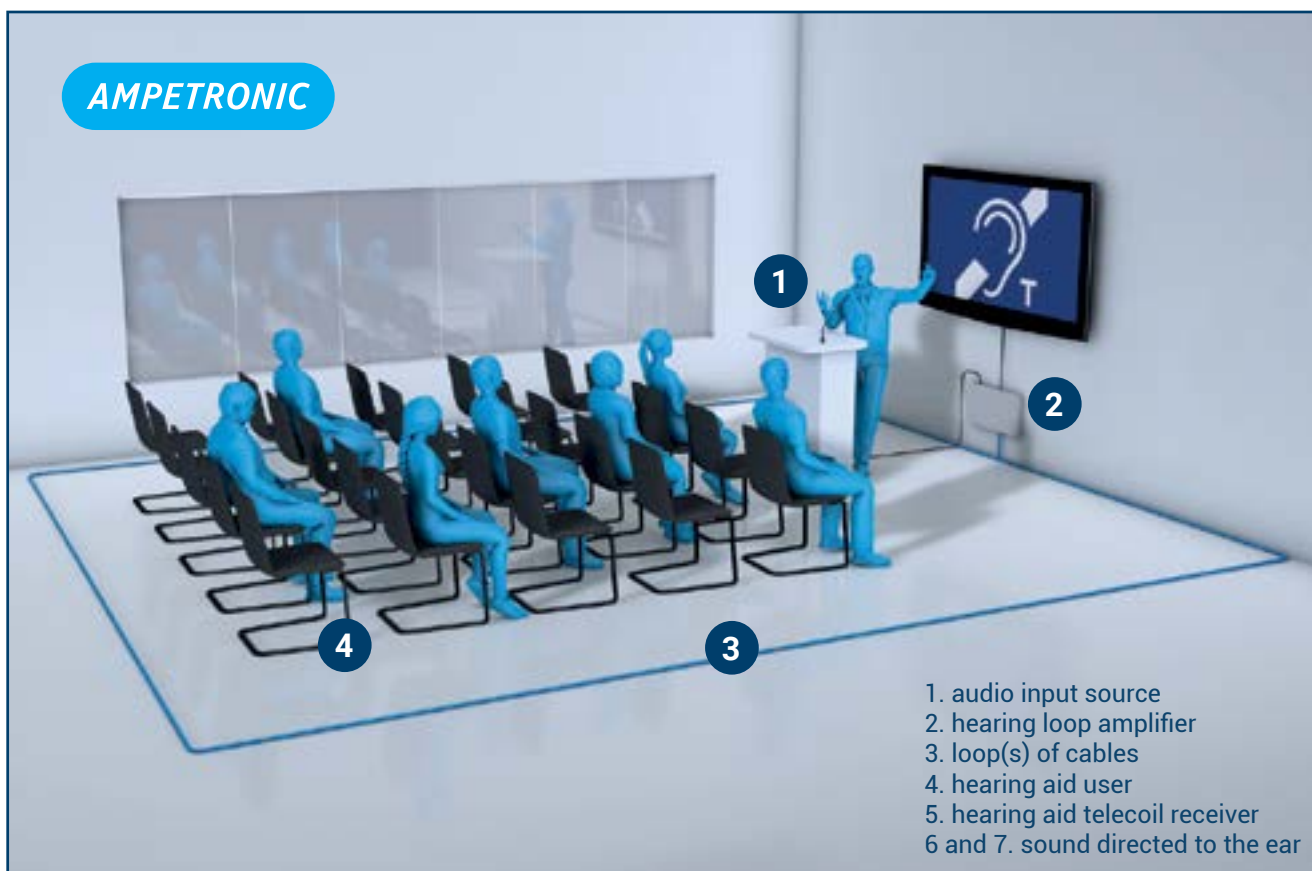
Ampetronic™ Hearing Loops:

- offer direct communication to users via their existing hearing aid without the need for additional receivers
- match the commitment of the user and offer a genuine benefit making their participation more inclusive and effective
- reduce overspill and so reduce interference or the possibility of broadcasting of sensitive information
- allow freedom of movement by ensuring a consistent signal throughout the looped area
- minimise the effects of metal in the structure
- can be integrated into new builds or retro-fit into existing structures

Facility operators can find themselves in an actionable position if there is no service provision that is of a genuine benefit to users i.e. the installation must be fit for purpose. The measurable performance of a Hearing Loop system is defined in the international IEC 60118-4 standard.

For more information on hearing loops and meeting the standards for hearing loop installations contact our friendly and knowledgeable team on **+44 (0) 1636 610062** or email sales@ampetronic.co

Hearing, induction and T-Loops



For more information on developing hearing loop systems please call our experts for assistance on +44 (0) 1636 610062 or email sales@ampetronic.co



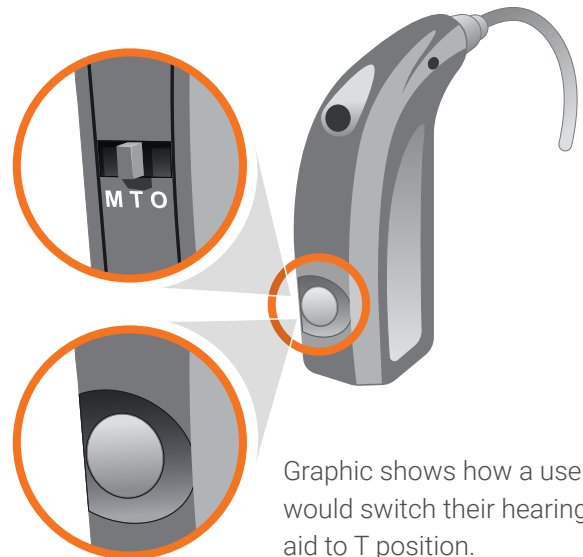
A hearing loop, also known as an induction loop or T-Loop, is an inherently simple assistive listening system, which provides access to facilities for those with a hearing impairment.

The number of users who can benefit from a loop system at one time, is only limited by the number of people that can fit in a 'looped' area. Expensive receivers are not required, and users don't suffer an inconvenience of asking for and wearing a headset, which could potentially be uncomfortably visible.

To take full advantage of Ampetronic™ Loop system solutions, a person with hearing loss needs only to switch their hearing aid to the T Position.

This technology takes a sound source, and transfers it directly to a hearing aid, without background noise. A hearing loop works by:

- 1 Capturing a sound source, such as a voice, TV, cinema sound system or other audio system using a microphone or a line out connection.
- 2 Sound signal is then connected to an audio hearing loop amplifier (also called a loop driver). This connection enables a current to pass through a hearing loop, typically made of copper tape or wire.
- 3 The copper wire hearing loop (usually) surrounds areas where listening audiences are located, and produces a magnetic field.
- 4 5 Magnetic field is picked up by a Telecoil, or T-coil, inside a hearing aid worn by hearing impaired members of the audience.
- 6 7 Hearing aids tailor sound to specific needs of an individual. Sound is delivered directly into the ear canal, without background noise, and with the spectrum of sound frequencies required for intelligibility.



Graphic shows how a user would switch their hearing aid to T position.

Plugging your AV system into the loop, as well as a good quality dedicated directional microphone, close to orator's position, will provide much better results.

Chambers and courtrooms

Many chambers and courtrooms are irregular in shape and some have a pitched (sloped) floor and/or terraced seating so that participants to the rear of the space are seated higher than those at the front, allowing them to see the proceedings. The shape and structure of a meeting chamber or courtroom can pose significant challenges for

Hearing Loop layout design.

To ensure that all participants have the same level of access to the spoken word when in a chamber or courtroom, it is essential that the right Loop layout is selected for the building's construction and architectural style.

A **perimeter loop** layout is a simple, easy to install, option for small, medium or large spaces where there is no metal in the building structure, no concerns about signal overspill and where there may be restrictions around the removal of flooring for installation, e.g. in a rented, serviced, listed or heritage building.

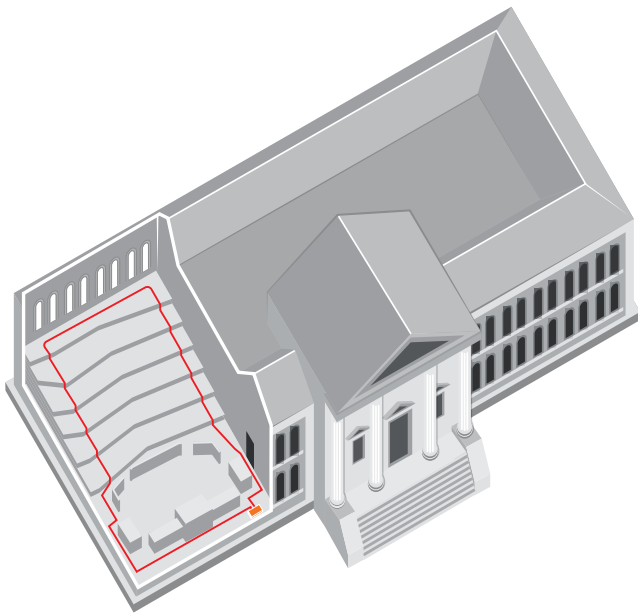
A **single array** can be useful in rooms with fixed seating and metal, although a **MultiLoop™ phased array system** provides more consistent coverage. Single and phased arrays are also a good choice where signal overspill between rooms is an issue.



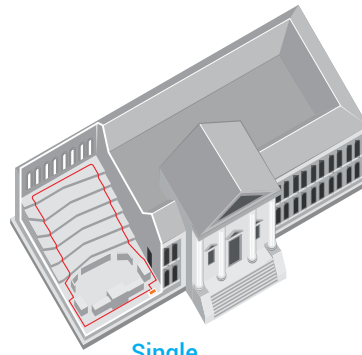
Congress Center, Hamburg,
Germany



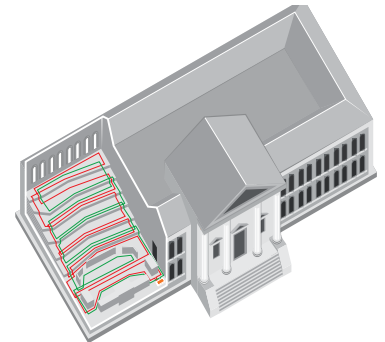
Stockholm City Hall, Stockholm,
Sweden



Perimeter loop



Single array



MultiLoop™ phased array

Conference halls and large meeting chambers tend to consist of areas greater than 6m wide. A **low loss MultiLoop™ phased array system** will provide the signal coverage and quality required for larger spaces. The addition of a low spill option will prevent the signal overspilling into adjacent rooms or areas and help to maintain confidentiality.

For more information on creating hearing loop systems for courtrooms or large chambers please call our engineers for assistance on **+44 (0) 1636 610062** or email sales@ampetronic.co

Audio networking

Dante™ is an uncompressed, multi-channel digital media networking technology which integrates media and control for your entire system over a single, standard IP network. One low-cost, easily-available CAT5e, CAT6, or fibre optic cable does it all. Simple and scalable, from a simple pairing to large capacity networks, even the most complex networks can be integrated quickly and easily. Dante™ is a trademark of Audinate Pty Ltd.

Perimeter loop and single array Drivers	
C Series	C5-1 Networkable
	C7-1 Networkable
D Series	D10-1 Networkable
	D10-1 Networkable and Dante™
ILD Perimeter Loop Drivers	ILD1000G
	ILD500
	ILD300
	ILD122

Low loss and low spill MultiLoop™ Drivers	
C Series	C5-2 Networkable
	C7-2 Networkable
D Series	D14-2 Networkable
	D14-2 Networkable and Dante™
	D10-2 Networkable
	D10-2 Networkable and Dante™
	D7-2 Networkable
	D7-2 Networkable and Dante™
MLD MultiLoop™ Drivers	MLD9
	MLD7
	MLD5

Public offices, side rooms and meeting rooms

Many public offices and meeting rooms are stand-alone areas that are regular in shape. In these areas it is important to bear in mind the issues faced by those with hearing difficulties.

The loudness of an orator drops off by 6 dB for every doubling of distance meaning that any audience member remote from the source may find it difficult to differentiate the desired voice from the ambient background noise. An Ampetronic™ **hearing loop** can help to overcome these limitations for a hearing aid user.

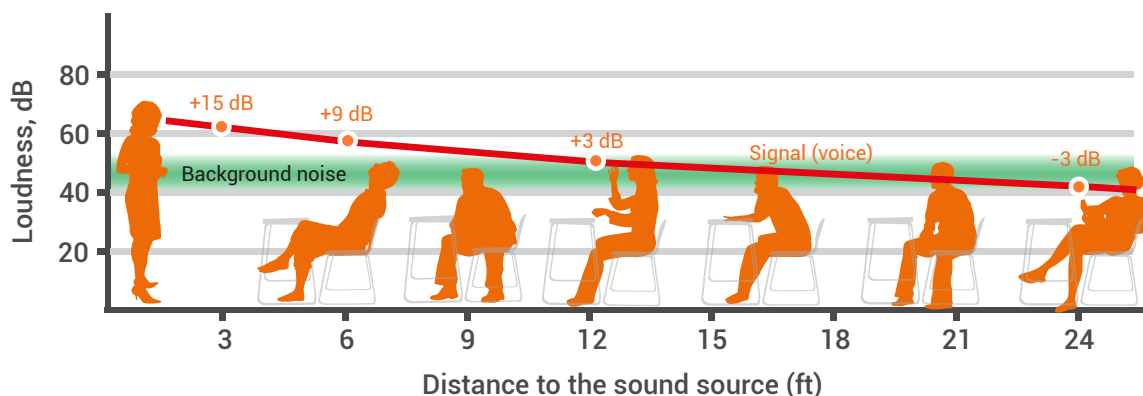
A **perimeter loop** layout is a simple, easy to install, option for small, medium or large spaces where there is no

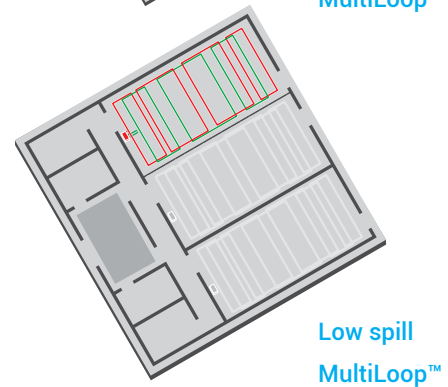
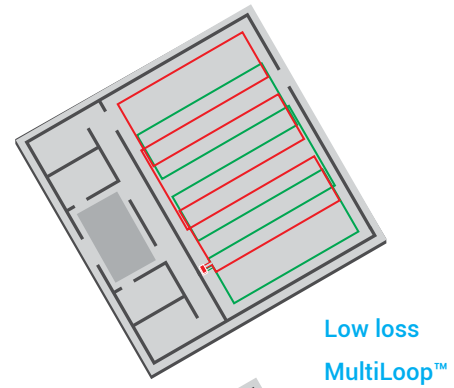
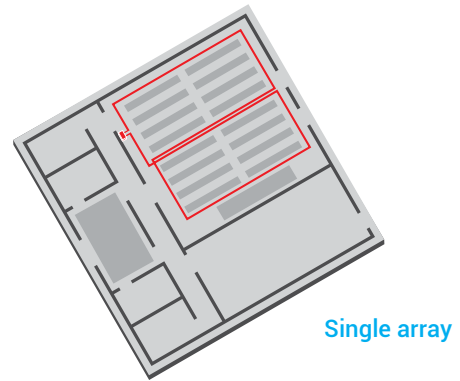
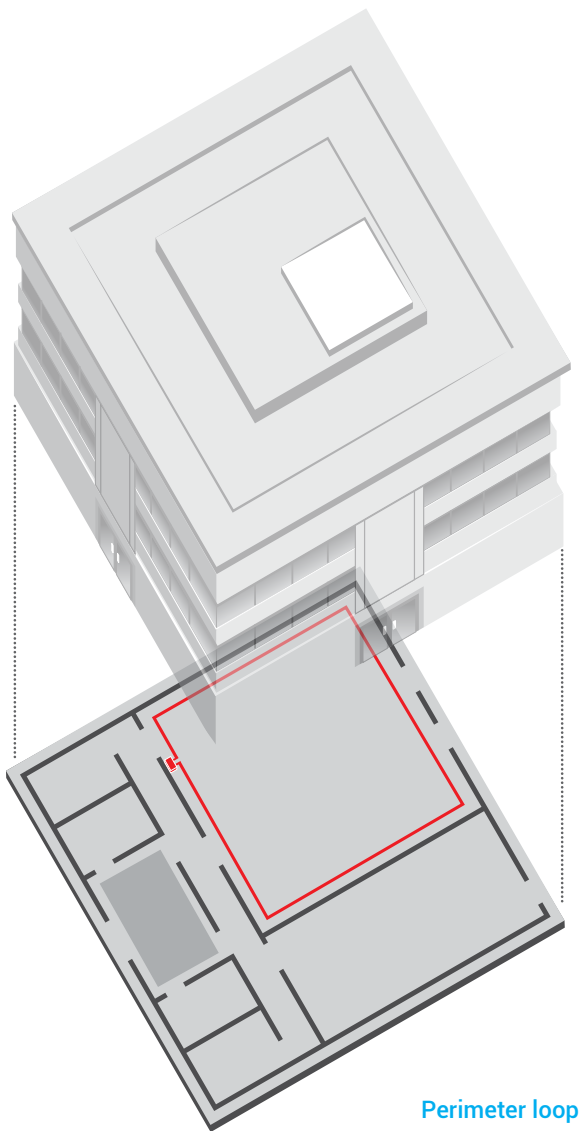
metal in the building structure, no concerns about signal overspill and where there may be restrictions around the removal of flooring for installation, e.g. in a rented, serviced, listed or heritage building.

For smaller areas without metal in the building structure, and where there are no other systems close by a **perimeter loop** layout is recommended however, a **single array** is useful in rooms with metal and fixed seating.

A **low loss MultiLoop™ phased array** provides more consistent coverage than a simple perimeter loop or single array when there is metal in the building structure.

If there are multiple areas to be covered in close proximity to each other **low spill MultiLoop™ phased arrays** are recommended to reduce signal cross over.

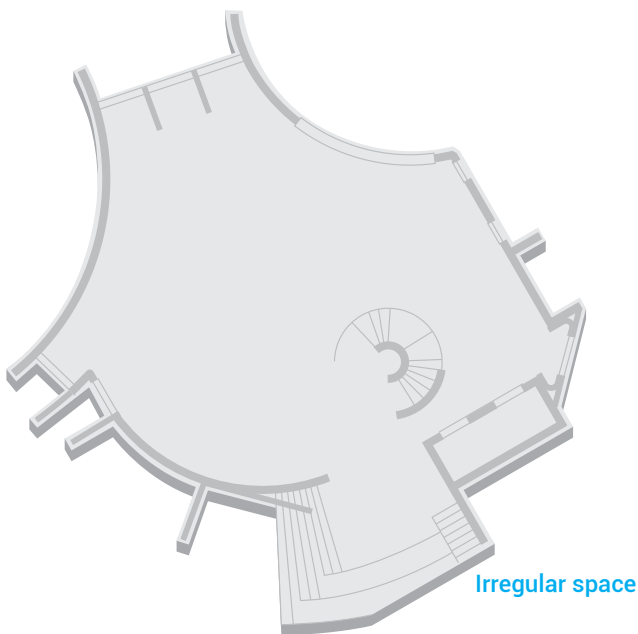




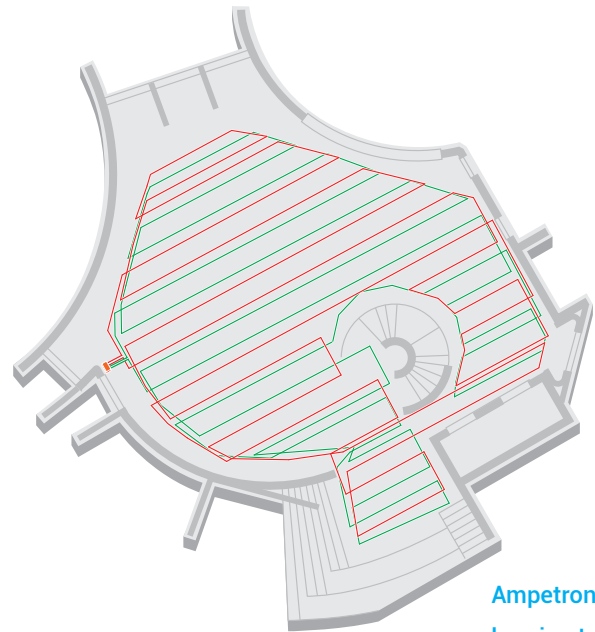
Perimeter Loop and single array drivers	
C Series	C5-1 Networkable C7-1 Networkable
D Series	D10-1 Networkable D10-1 Networkable and Dante™
ILD Perimeter Loop Drivers	ILD1000G ILD500 ILD300 ILD122
CLS Wall Mount Loop Drivers	CLS1 CLS2

Low loss and low spill MultiLoop™ drivers	
C Series	C5-2 Networkable C7-2 Networkable
D Series	D14-2 Networkable D14-2 Networkable and Dante™ D10-2 Networkable D10-2 Networkable and Dante™ D7-2 Networkable D7-2 Networkable and Dante™
MLD MultiLoop™ Drivers	MLD9 MLD7 MLD5

Complex and multipurpose rooms



Irregular space



Ampetronic™ hearing Loop solution

In addition to meeting chambers, courtrooms and offices there are very often a number of areas that do not conform to simple geometry.

In these circumstances a **MultiLoop™ phased array**, with low loss and/or low spill functions where required, would provide the coverage needed.

Areas that can be divided or expanded dynamically as the need dictates may also require more complex solutions for assistive listening.

For more information on creating systems for multi-storey buildings please call our engineers for assistance on **+44 (0) 1636 610062**

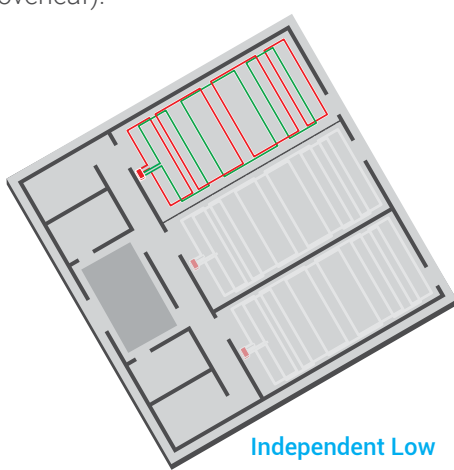
Many diverse meeting area will have the need to be multipurpose. They will often have several unique installed systems all designed to work independently (closed mode) and in synchronisation with each other (open mode) as one large system.

A **low spill, phased array** system can be designed to work independently when a room divider is in situ; dividing the room off from the adjacent rooms. This configuration would suit a space where prevention of overspill is required to minimise any crossed signals e.g. a multipurpose meeting/training room.

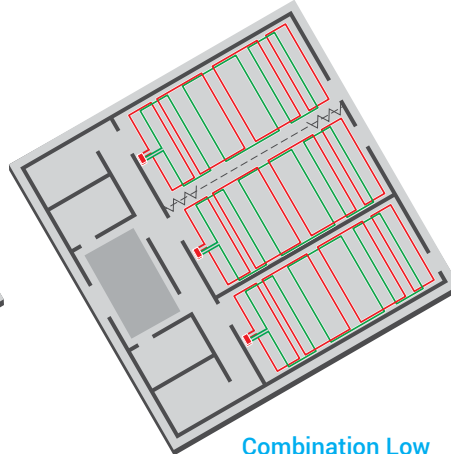
Low spill, phased arrays are also used to prevent overspill between rooms in order to maintain confidentiality (see overleaf).

With the space opened up, minus the room divider the **low spill system** works with the **low spill, phased array** system installed in the adjacent rooms to combine as one, **low spill, phased array** system. This configuration could accommodate a variety of meeting scenarios including interviews, consultations and jury deliberation.

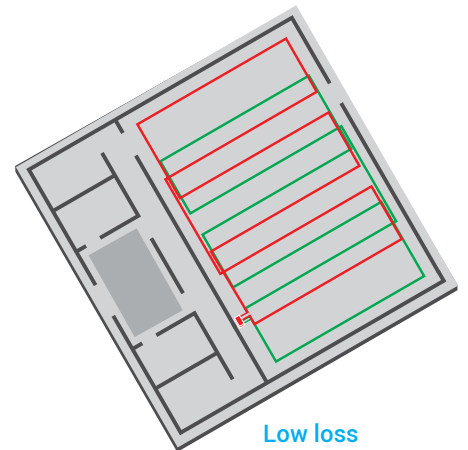
Rooms and large areas in excess of 6m wide with metal in the structure can also be a challenge for loop installations. Ampetronic™ **low loss MultiLoop™ phased array** layouts are ideal for large areas with metal loss, ensuring that an even signal is achieved and that all parts of a larger room can be used at all times.



Independent Low spill array



Combination Low spill arrays



Low loss MultiLoop™ phased array



London Guildhall, London, UK

Low spill MultiLoop™ Drivers

C Series	C5-2 Networkable
	C7-2 Networkable
D Series	D14-2 Networkable
	D14-2 Networkable and Dante™
	D10-2 Networkable
	D10-2 Networkable and Dante™
	D7-2 Networkable
	D7-2 Networkable and Dante™
MLD MultiLoop™ Drivers	MLD9
	MLD7
	MLD5

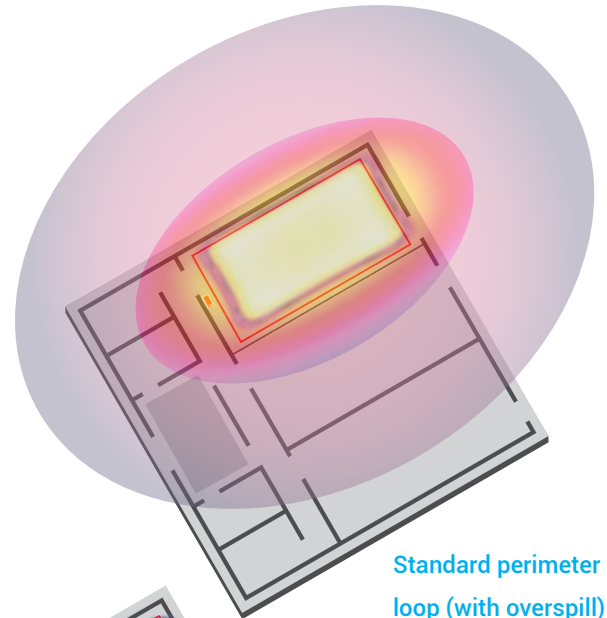
Secure areas

Low spill MultiLoop™ phased arrays are useful when trying to maximise confidentiality by ensuring the signal is restricted to the chosen area and preventing overspill.

To ensure adequate coverage when using a standard Loop, particularly around the edges of a room, the power used to drive the loop can cause a significant amount of the signal to be broadcast beyond the areas physical boundaries.

An Ampetronic™ a **low spill MultiLoop™ phased array** is designed such that the signal is prevented from overspilling into adjacent areas or rooms without losing coverage or quality at the edges of the looped area.

For more information on minimising overspill for areas requiring confidentiality please call our engineers for assistance on **+44 (0) 1636 610062**.



Standard perimeter loop (with overspill)



Low spill MultiLoop™ phased array (minimises overspill)

Low loss MultiLoop™ Drivers	
C Series	C5-2 Networkable
	C7-2 Networkable
D Series	D14-2 Networkable
	D14-2 Networkable and Dante™
	D10-2 Networkable
	D10-2 Networkable and Dante™
	D7-2 Networkable
	D7-2 Networkable and Dante™
MLD MultiLoop™ Drivers	MLD9
	MLD7
	MLD5



Sydney Town Hall, Sydney, Australia

Reception areas and service points

Dealing with background noise when faced with a busy reception desk can be a challenge for a person with hearing loss. Distance from the receptionist can also cause frustration.

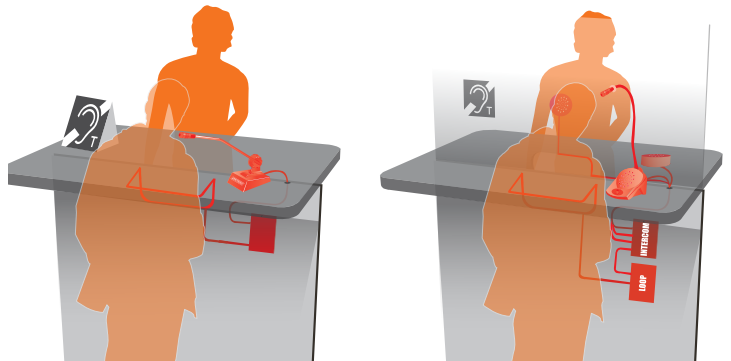
When combined with a preformed loop and microphone **Ampetronic™ CLD1 service point** amplifiers provide the person with hearing loss with clear, intelligible sound direct to their hearing aid.

A security screen may also be present, which itself can interfere with communications. Intercoms, also known as speech transfer systems (microphone/speaker at each side of the screen connected to a duplex amplifier), can resolve issues of background noise and those caused by a security screen.

Care should be taken to assess the construction of the bulkhead or dividing barrier when selecting a suitable Hearing Loop amplifier and loop type. Metal bulkheads

absorb the magnetic field produced by the system, and whilst this can normally be addressed by selecting a more powerful amplifier, in extreme cases a multi-turn loop in an enclosure fitted to the client side of the dividing barrier may be required.

The **Ampetronic™ TalkPerfect** offers effective communication through physical barriers supporting privacy and security in a robust and easy to use system.



University of Aberdeen, Reception desks and service points

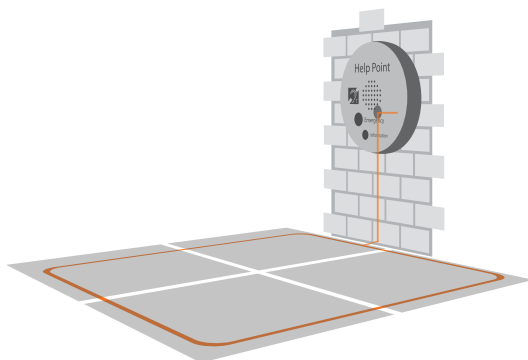
Service point and speech transfer

CLD1 Service Point Hearing Loop Amplifier	CLD1
	CLD1-AC
Speech Transfer System	TalkPerfect
CLS Wall Mount Loop Drivers	CLS1
	CLS2

Intercoms

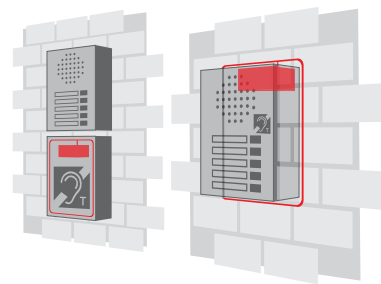
Intercom systems are now commonplace in a wide variety of information and service points, including automated service points and car park barrier systems. Intelligibility of the sound produced by these systems can be problematic for hearing-aid users as sound reproduced through small speakers has limitations and competes with other environmental sounds.

Ampetronic™ OEM intercom solutions are designed to provide full area coverage by driving a single or multi-turn loop around the perimeter of the standing area at the point of location. The amplifier is normally housed within the enclosure, and the loop itself is generally installed by cutting a channel into the floor or within concrete screed.

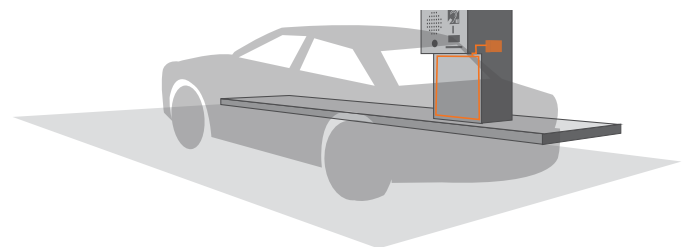


Ampetronic™ amplifiers can also be used to drive **small, vertically mounted, integrated and external panel loops**. These offer limited area coverage, up to approximately 1m distance from the loop. However, they are often a simple solution for installation and can be located around the edge of the enclosure recessed into brickwork.

A common and effective solution is to house the loop and amplifier in a separate enclosure at a convenient location above or below the intercom panel.



All driver units feature an audio system that is designed for excellent intelligibility and include metal loss frequency compensation to correct for the metal structure of the enclosure.



Intercoms

HLS Series

HLS - DM1

Lifts and elevators

Ampetronic™ elevator solutions are designed to provide full area coverage by driving a loop around the perimeter of the car, preferably positioned at ceiling height.

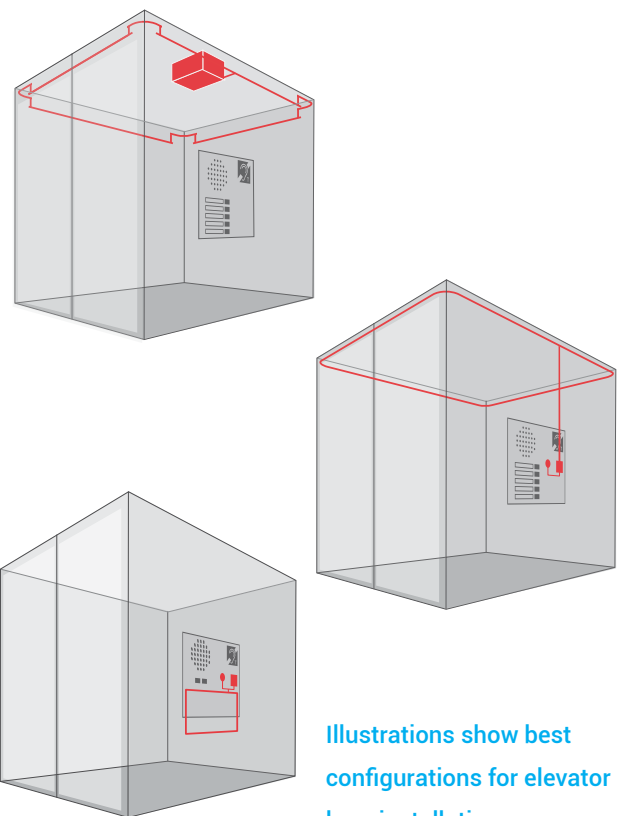
For best performance a loop should be placed inside the elevator and must not be behind metal panels, or inside a metal enclosure in the roof space. Such installations can cause unacceptable reduction and distortion of magnetic field. Driver unit can be housed within elevator car roof, or integrated into control panel.

There are two standard options for the loop itself:

Loop bars - Perhaps the most robust solution is to attach custom built stainless steel loop bars to the ceiling inside. Loop bars can be custom designed and supplied by Ampetronic™ to fit your specific requirements. Such loop bars provide a resilient and aesthetically pleasing solution, with excellent performance.

Loop cable - In some lifts it is possible to fit a coil of loop cable inside an elevator behind non-metallic trim, or in rare cases inside roof space, if non-metallic.

Where an area coverage loop cannot be installed, an amplifier can be used to drive a smaller loop placed on or inside non-metallic wall panels or trim. This style of installation restricts useful magnetic field, to an area no more than 1m from loop coil. Such short distances makes such a small loop ineffective for large elevators, for use with a public address (PA) system, or for safety communications such as a voice evacuation system.



Illustrations show best configurations for elevator loop installation.

It's important to note that the magnetic field will often be disrupted when an installation is behind a metal panel or metal trim. This will be the case with any amplification method. Metal can erode signal strength known as metal loss. It is important to factor metal loss into design, amplification or both.

Elevator intercoms or help points

HLS Series

HLS-DM2

Summary table



Useful quotation information

When requesting a quote our experienced and friendly staff will be able to help and guide you through the process. However, if you do have the following information about your project collated, it can help us to prepare a more accurate quotation or design as quickly as possible.

- Q. What are your site details?
- Q. What type of system is needed?
- Q. Are there any other loop systems nearby?
- Q. Are there any issues of confidentiality between areas?
- Q. Do you have scaled plans of the rooms and area to be covered?
- Q. Is there any metalwork contained within or close to the loop area?
- Q. What type of installation would you prefer for example a flat copper tape suitable for installation under carpets and flooring, or a copper wire for fixing to walls or ceilings?

Area Type	Loop Type(s)	Product Range(s)
Chambers and courtrooms	Simple perimeter loop	D Series (single) ILD Series
	Single array	
	Low loss MultiLoop™ phased array (for 6m wide spaces with metal structure)	D Series (dual) MLD Series
	Low spill MultiLoop™ phased array (when there are other loop systems nearby)	
Stand-alone public offices, side rooms and meeting spaces	Simple perimeter loop	D Series (single) ILD Series
	Single array	CLS
	Low loss MultiLoop™ phased array	D Series (dual) MLD Series
Complex multipurpose rooms	Low loss MultiLoop™ phased array	D Series (dual) MLD Series
	Low spill MultiLoop™ phased array	
Secure Areas	Low spill MultiLoop™ phased array	D Series (dual) MLD Series
Reception areas and service points	Open service point	CLD1 CLS
	Security window service point	CLD1 CLS TalkPerfect
Door entry, access and help points, entry barriers	Intercoms	HLS Series
Lifts and elevators	Lift and elevator intercoms / help points	HLS Series

If you have any questions please contact us directly on **+44 (0) 1636 610062** or email: sales@ampetronic.co

Signage

Hearing loops provide an important service for hearing aid users and others with challenging levels of hearing loss in many environments and applications. However, loops are ineffective if hearing aid users are unaware such a facility is available for them to tune into.

Loop systems are, in effect, invisible and inaudible to potential users. Therefore, it is important that necessary signage is displayed, so users know to switch their hearing aid devices to the correct setting to utilise them, or to ask for a receiver.

There is an internationally recognised Hearing Loop sign consisting of an ear graphic with a 'T' and some brief instructions for those unfamiliar with such technology.

Signage requirements vary dependent on application, but the following is a good guide to what is both suitable and necessary...



Signage recommendations	
Application	Recommended signage requirement
Room area coverage system (courtroom, chambers, meeting rooms)	A sign or window sticker at average eye height to each entry point to the space (on a door is perfect), and at least one large sign at a visible point on a wall within the looped space. N.B. If the loop does not cover the entire area then a map of the coverage area should be at each entry point.
Local area service point system (service point, reception desk)	A sign displayed on the counter or as close as possible at a level that cannot be obscured by anyone standing at the service point.
Intercoms and automated audio assistance message systems (entry points)	A small sign at a level where it is visible to the person pressing the 'intercom', 'information' or 'help' button

System design support and training



System design support

Ampetronic™ can provide installation design drawings by collaboration with our experts, or by utilising our design creation software support. Such designs give you a fully working and regulation compliant solution, for any loop installation you may be involved with.

Complex MultiLoop™ array installation designs, are normally produced within seven working days on average, and are charged at published rates, on a per room or per-independent area basis.

For each project, an installation design charge will apply to every different room design. Identical room drawings within same project, will attract only one charge. Simple perimeter loop installation designs will not be charged for.

Each full installation design gives you:

- scale drawings of room showing precise layout of loop wires
- layout drawings for each loop array
- electrical connection drawings
- a set of written installation design notes detailing assumptions, project specification information, expected performance, and equipment list

Installation designs rely heavily upon quality of information supplied. In particular, accurately scaled building drawings are essential, to give detailed information for creation of accurate quotations.

Alternatively, if you would like to design, test, and commission, your own loop projects, then contact us to access Loopworks Design cloud based software, the world's most powerful collaboration, design, and measurement suite of software tools. **Loopworks™**.

For more information on hearing loop design, meeting regulations for hearing loop installations, or if you would simply like to register for Loopworks™ access, contact our friendly and knowledgeable team on **+44 (0) 1636 610062** or email **sales@ampetronic.co**



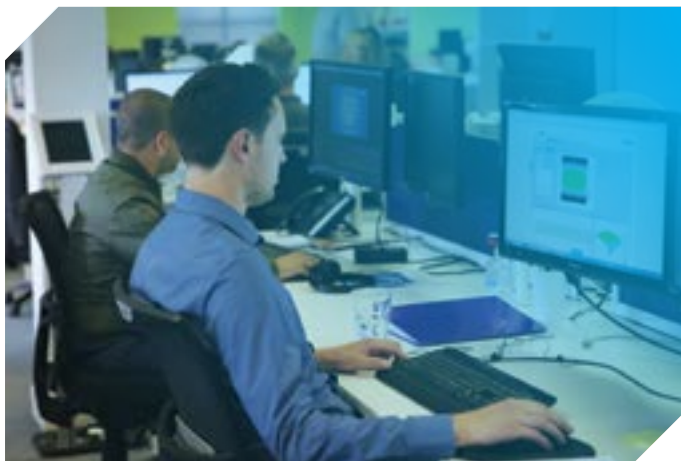
Training

Ampetronic™ continued professional development (CPD) training services, are designed to provide technical and general awareness for end-users, clients, and consultants. CPD is also available for professional installers and system integrators.

We provide full day, in-house, training courses, covering all aspects of hearing loop systems, aimed at audiovisual professionals, specifiers, and contractors. Free educational CPD seminars are also available, for general awareness and sales team training, which can take place at a venue of your choice, or be viewed as a webinar.

For details of our free one hour 'Equality of access to audio for people with hearing loss' seminar and webinars or of our full day classroom based course 'Practical installer training day', please contact our office on **+44 (0) 1636 610062**

Training videos and product demonstrations can be viewed online at the **Ampetronic™ YouTube Channel**
<https://www.youtube.com/user/AmpetronicLoops>



Loopworks™ suite

Ampetronic™ Loopworks™ complete productivity suite enables cost effective, dependable, and compliant system development, testing, and expedited issue resolution.

Loopworks™ offers:

- instant access to your project information
- a library of the most credible loop information
- reliable, expert support, whenever and wherever you need it.

Loopworks™ productivity suite allows you to:

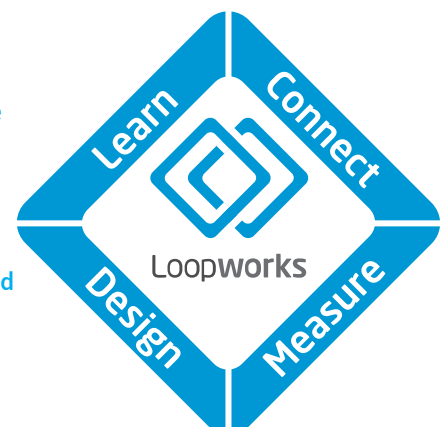
Learn from the latest information, developments and support from the worlds' most credible information sources.

Connect instantly to detailed project information, in the office or the field, minimising planning and administration delays. You can also connect to our dependable, expert support when and where you need it, reducing expensive interruptions in project development and implementation.

Measure the performance of systems against relevant standards with Measure app and desktop support. Measure enables easy on-site information retrieval, system testing, and issue resolution.

Design loops using our powerful design and support online cloud based software tool for expedited, credible and compliant system development.

Loopworks software suite comprises four modules, with desktop, mobile app and cloud support delivery.

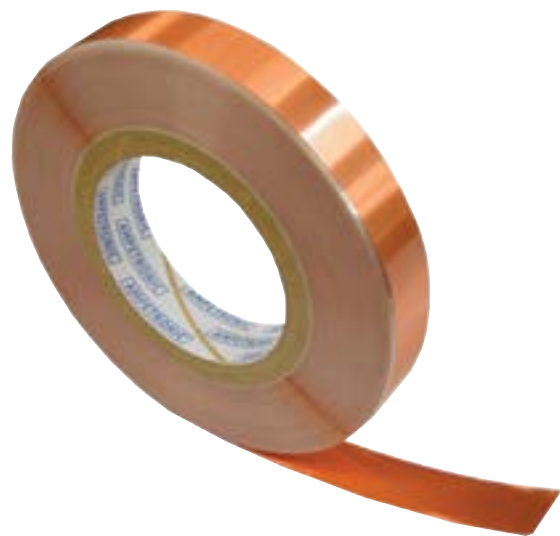


Accessories, receivers and measurement systems

Installation accessories

In addition to hearing loop drivers, Ampetronic™ can provide you with accessories needed to successfully install and commission a hearing loop system. Our range includes:

- direct burial cable
- flat copper tape
- printed warning tape
- hearing loop signs
- PVC extrusion for copper tape
- crimps and crimp tool for copper tape
- wall mounts
- rack mount equipment
- counter loop accessories



Ampetronic manufactures a range of market leading cables and copper tape for creating loop systems.

Loop receivers

ILR3 and ILR3+ Audio hearing loop receiver

Our ILR3 is a high quality audio hearing loop receiver which allows the user to listen to an audio frequency hearing loop system, using a standard pair of stereo headphones. ILR3+ is designed to make it simpler for anyone to regularly check that a loop system is working, and has a field strength at a correct level to benefit users.



ILR3+ Audio hearing loop receiver

Testing and measurement systems

Loopworks™ Measure iOS app

Loopworks™ Measure combines an iOS phone or tablet app which utilises a self-calibrating receiver. When used together, Measure app and the R1 become the most accurate, dedicated field strength meter (FSM) currently available. This combination used to record field strength statistics, can help to ensure requirements of IEC 60118-4 have been met.

Loopworks™ Measure app uploads data collated via sync to Loopworks™ digital suite, allowing all results to be digitally stored in the cloud, online storage simplifies management of rooms across multiple buildings and sites.



Loopworks™ Measure iOS app

Loopworks™ Measure receiver field strength meter (R1)

By simply plugging into the headphone jack of your mobile device, our R1 Receiver is a high quality field strength meter and audio hearing loop receiver. R1s are designed to be used in conjunction with our Loopworks™ Measure iOS app. Contact us on sales@ampetronic.co or buy one directly from our website at www.ampetronic.co/products.



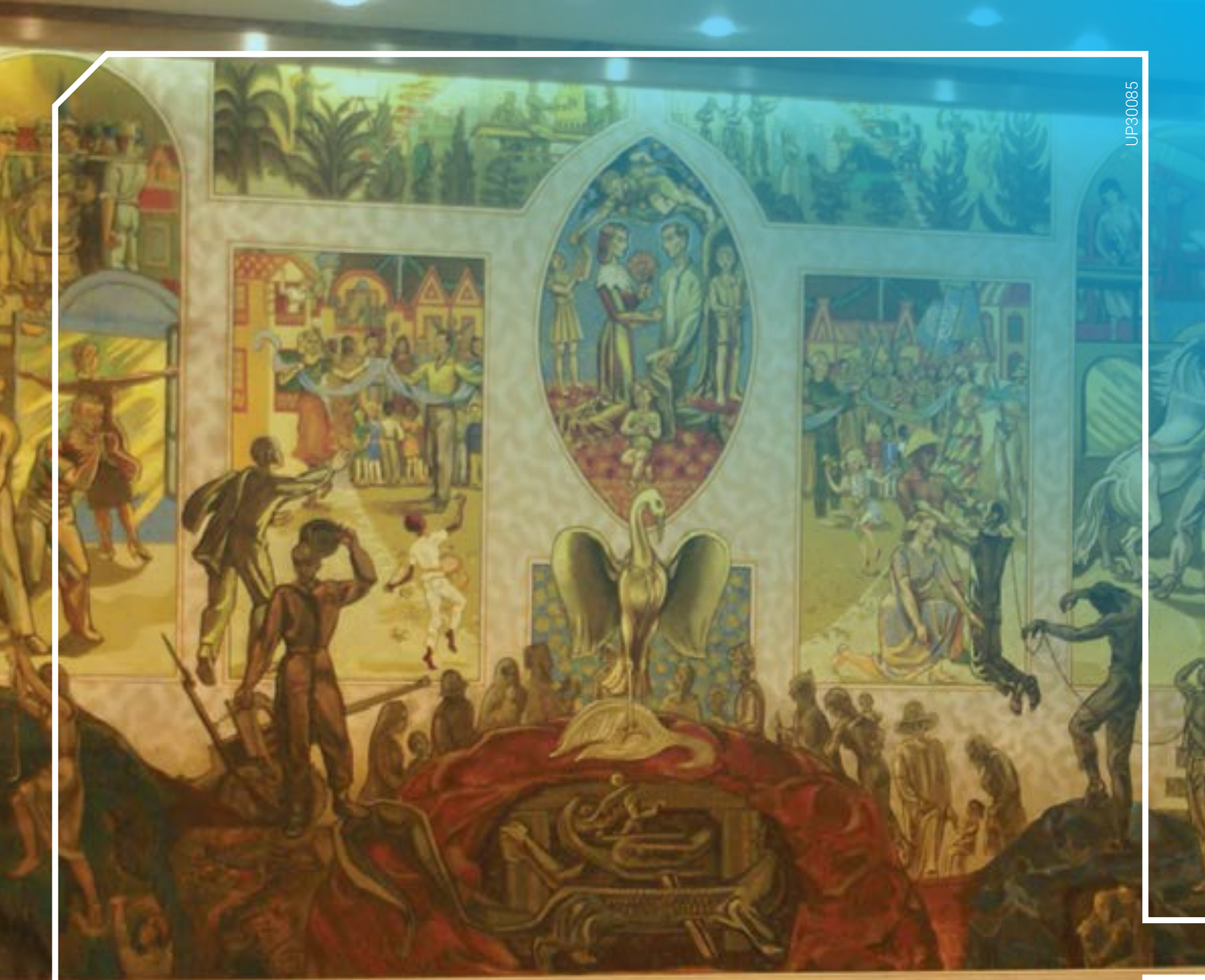
Loopworks™ R1 receiver

Ampetronic's field strength meter (FSM)

Ampetronic's FSM device is a cost effective and simple solution for measuring, setting up, and commissioning hearing loop systems, to meet requirements of IEC60118-4. There are three calibrated operational modes for assessing background noise, field strength, and frequency response. Ampetronic's FSM also doubles as a loop listener.



Field strength meter (FSM)



Providing a genuine benefit.

To find out what we can bring to your project talk it through with our expert team on +44 (0) 1636 610062 or email us at sales@ampetronic.co

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AMPETRONIC®

Listen to the difference
Unit 2, Trentside Business
Village, Farndon Road,
Newark, NG24 4XB
United Kingdom

www.ampetronic.co