Education

Hearing loops
Application guide

AMPETRONIC®
Listen to the difference

Pictures for illustration purposes only.

Contents

04. Ampetronic™ hearing loops

06. Hearing, induction and T-Loops

08. Lecture halls and theatres

10. Stand-alone classrooms, meeting rooms and laboratories

12. Complex and multipurpose rooms

15. Reception areas and service points

16. Door entry, access and help points

17. Lifts and elevators

18. Summary table

19. Signage

20. System design support and Training

22. Accessories, receivers and measurement systems

NB: 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.com

Pictures for illustration purposes only.

Ampetronic™ Hearing Loops

- communicate directly with hearing aid users
- make learning enjoyable again
- give them the freedom to move

Pictures for illustration purposes only.

15 percent of the population experience hearing loss, one in four of those use a hearing aid. In recent years there were over 2.2 million students studying at UK higher education institutions. That's a potential population of more than 85,000 people in higher education alone who have paid to be able to utilise assistive listening technologies.

Most hearing aid users would say that when they use their devices in one-to-one conversations, they work very well. Difficulties arise when the level of ambient noise is too great, or the distance between speaker and listener is increased, as in a classroom or lecture theatre.

Problems are exacerbated if assistive listening system in use has been poorly specified or installed, particularly when:

- there are large and complex room structures
- multipurpose rooms are in use for example in partitioned meeting rooms
- overspill can cause interference or broadcast of signal
- metal is present in building structure or room contents

Ampetronic™ Hearing Loops:

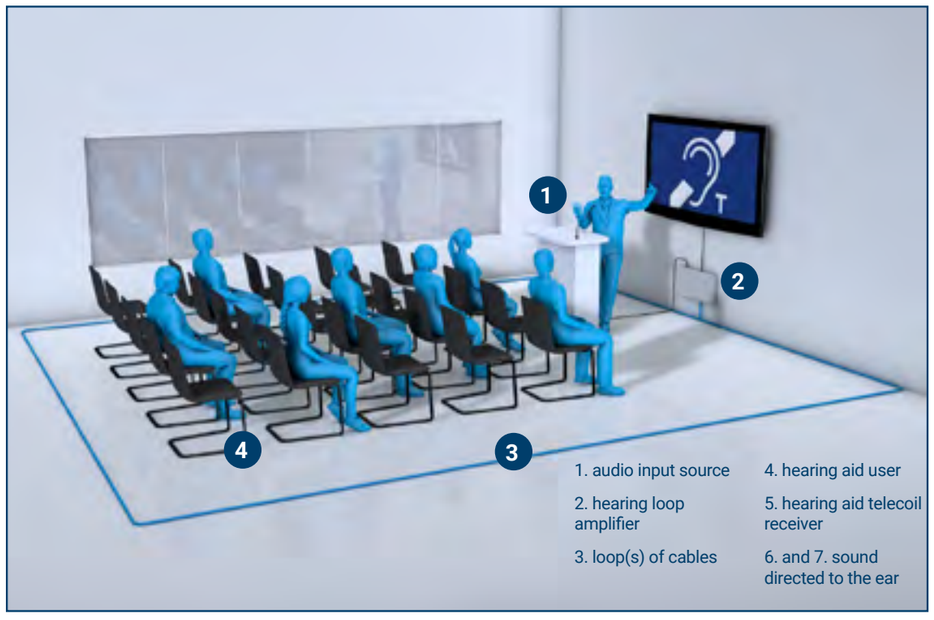
- **offer direct communication to users via their existing hearing aid, without need for additional receivers**
- **make a user's learning experience much more enjoyable**
- **allow freedom of movement by ensuring a consistent signal throughout looped area**
- **reduce overspill reducing interference or the risk of broadcasting sensitive information**
- **minimise effects of signal loss to metal in building structure**
- **can be integrated into new builds, or retro-fit into existing structures**

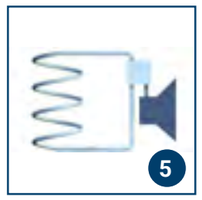
Facility operators can find themselves in an actionable position. For example, loop regulations define if there is a service provision, it must be of a genuine benefit to users, that is, the installation must be fit for purpose. Performance measures of a Hearing Loop system are defined in the international IEC 60118-4 standard.

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

Pictures for illustration purposes only.

Hearing, induction and T-Loops





For more information on developing hearing loop systems please call our experts for assistance on
UK: +44 (0) 1636 610062

Pictures for illustration purposes only.

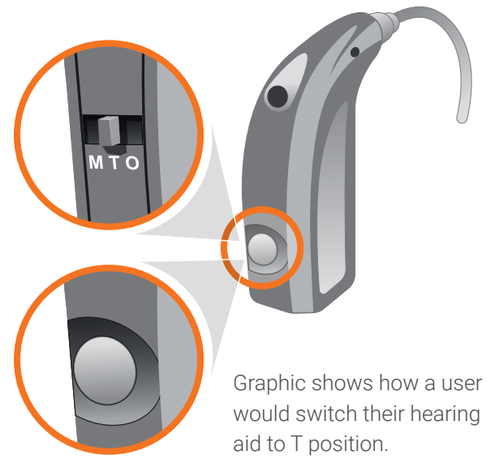
A hearing loop, also known as an induction loop or T-Loop, is an inherently simple assistive listening system, which provides access to facilities for those with a hearing impairment.

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.

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 be potentially 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.



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.

Lecture halls and theatres

Lecture halls almost always have a sloped floor and very often fixed seating as well; both of which can pose challenges for Hearing Loop layout design.

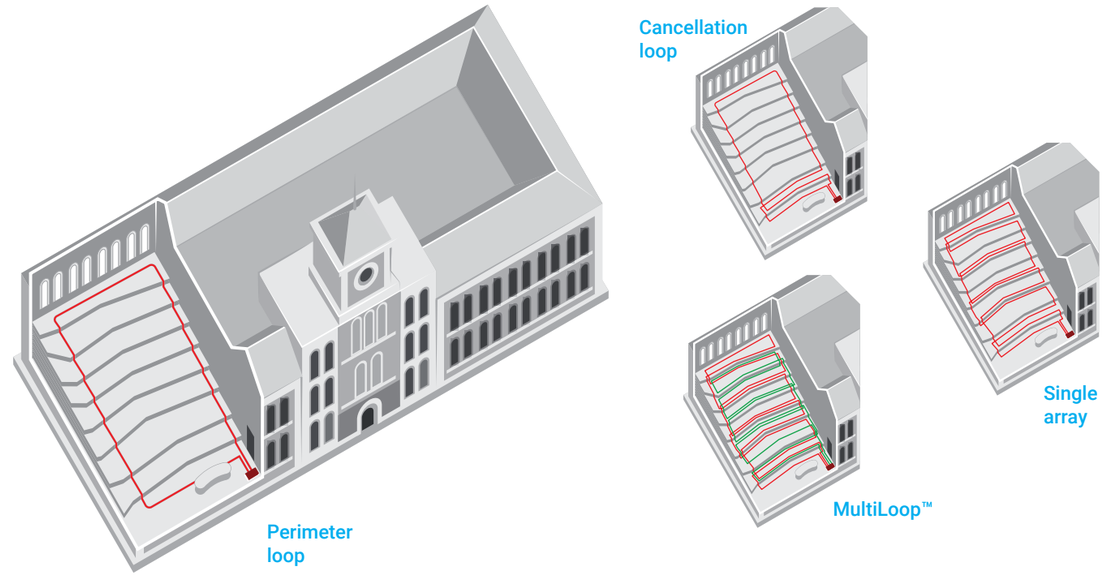
To ensure that all students have the same level of access to the spoken word, it is essential that an appropriate Loop layout is selected. Appropriate loop design can depend on building construction and architectural style.

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, for example in a rented, serviced, listed or heritage building.

Magdalene College, Cambridge, UK utilises an Ampetronic perimeter loop

Queen's University, Belfast, UK have Ampetronic MultiLoop™ systems installed.

Pictures for illustration purposes only.



Where interference / overspill is an issue at the stage / presentation area of the theatre e.g. due to electronic equipment or instruments then a **cancellation loop** maybe a suitable option.

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

Audio networking Dante™

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, or CAT6 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

Low loss and low spill MultiLoop™ Drivers	
C Series	C5-2 Networkable
	C7-2 Networkable
	C10-2 Networkable
	C14-2 Networkable

For more information on developing hearing loop systems please call our experts for assistance on **UK: +44 (0) 1636 610062**

Pictures for illustration purposes only.

Stand-alone classrooms and meeting rooms

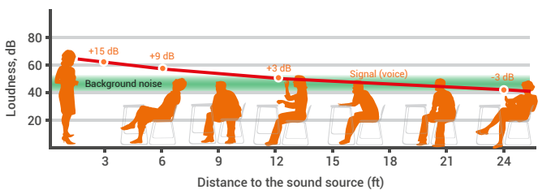
Many teaching spaces are based on a lecture theatre. However, there are some areas in need of a loop that are regular in shape. Whatever the configuration, it is still important to bear in mind issues potentially faced, by those with hearing difficulties.

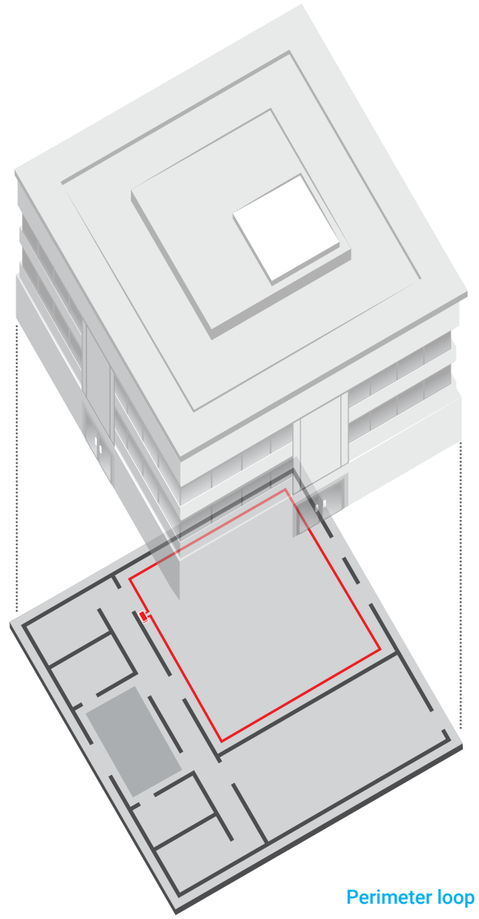
The loudness of a performance decreases by six decibels for every doubling of distance. Therefore, any audience member remotely seated from the performer or source, may find it difficult to differentiate desired sound from ambient background noise. In real world situations intelligibility of a sound can also be complicated by reverberation when bounced off walls and room contents. An Ampetronic™ **hearing loop** can help a hearing aid user overcome these limitations.

A **perimeter loop** layout is a simple, easy to install, option for small, medium, or large spaces where there is limited potential for metal loss to building structure. Such a solution also assists where there are no concerns about signal overspill, and where there may be restrictions around removal of flooring for installation. Restrictions can occur in a rented, serviced, listed, or heritage building. A **single array** is a useful solution in rooms with metal and fixed seating.

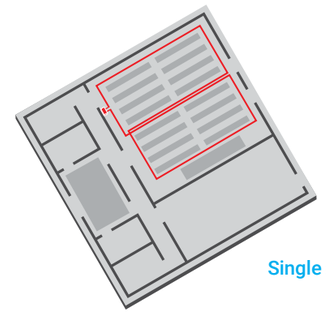
A **low loss MultiLoop™** system, provides a more consistent coverage over larger areas, than a simple perimeter loop. Multiloops provide comprehensive cover for larger areas. A multiloop is also a good choice where metal is present in the building.

Where signal overspills outside of a looped area, there may be an issue. For example, in adjacent studios or meeting rooms a **low spill MultiLoop™** would be a more appropriate option. Such a solution would limit sound from overlapping between neighbouring areas.

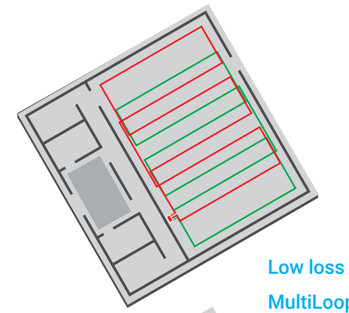




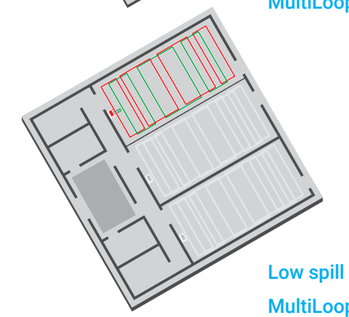
Perimeter loop



Single array



Low loss MultiLoop™



Low spill MultiLoop™

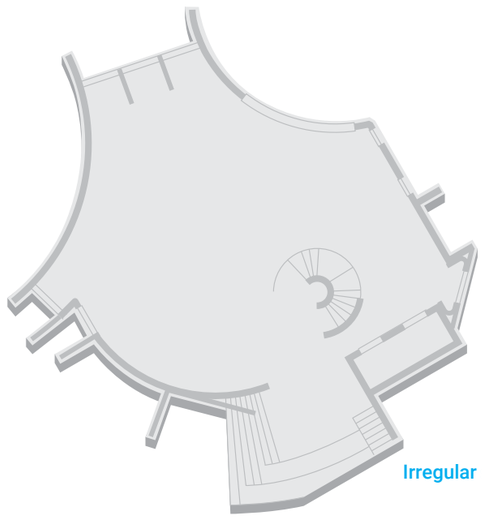
Perimeter Loop and single array drivers	
C Series	C5-1 Networkable C7-1 Networkable
CLS Wall Mount Loop Drivers	CLS1 CLS2

Low loss and low spill MultiLoop™ drivers	
C Series	C5-2 Networkable C7-2 Networkable C10-2 Networkable C14-2 Networkable

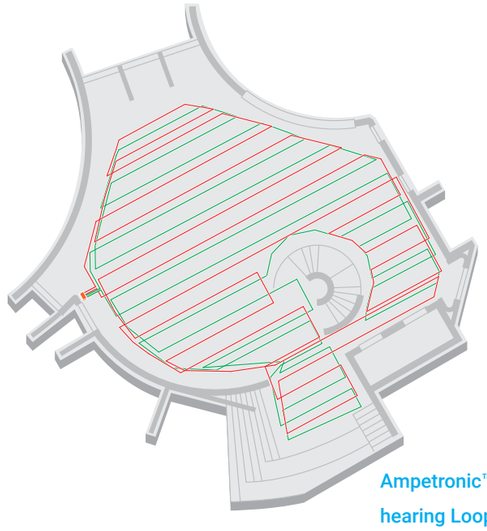
For more information on hearing loops and meeting standards for hearing loop installations, contact our friendly and knowledgeable team on **+44 (0) 1636 610062** or email **sales@ampetronic.com**

Pictures for illustration purposes only.

Complex and multipurpose rooms



Irregular space



Ampetronic™ hearing Loop solution

In addition to lecture halls, classrooms, offices and laboratories, there are very often a number of areas that do not conform to simple geometry.

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

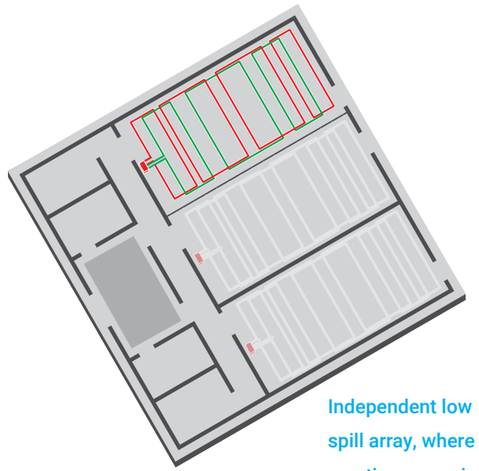
Areas that can be divided or expanded dynamically, as need dictates, may also require more complex solutions for assistive listening.

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

Pictures for illustration purposes only.

Most diverse entertainment, meeting, or learning environments will need to be multipurpose. Such spaces will often have several unique installed systems, all designed to work independently, in closed mode, and in synchronisation with each other, in open mode, as one large system.

A **low spill, MultiLoop™** system can be designed to work independently, when a room divider is in situ; dividing the room off from adjacent rooms. Such a configuration would suit a space where prevention of overspill is required, to minimise any crossed signals for example, a multipurpose meeting or training room.

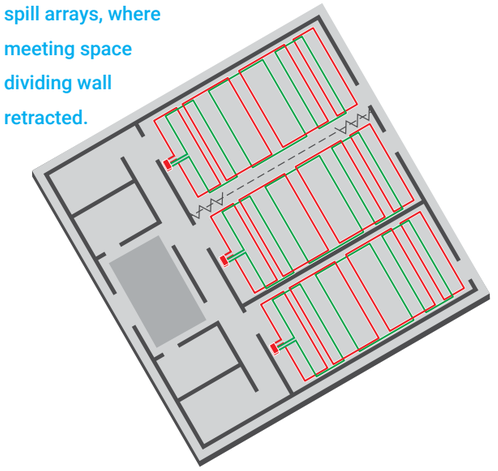


Independent low spill array, where a meeting space is divided.

Low spill, MultiLoop™ are also used to prevent overspill between rooms in order to maintain confidentiality.

With space opened up, minus room divider, the **low spill system** works with **low spill, MultiLoop™** systems installed in adjacent rooms, to combine as one, **low spill, MultiLoop™** system. Illustrations below seek to show how such a loop system supports multiple room configuration options. This configuration could accommodate a variety of meeting scenarios including training, conferences and break out activities.

Combination low spill arrays, where meeting space dividing wall retracted.



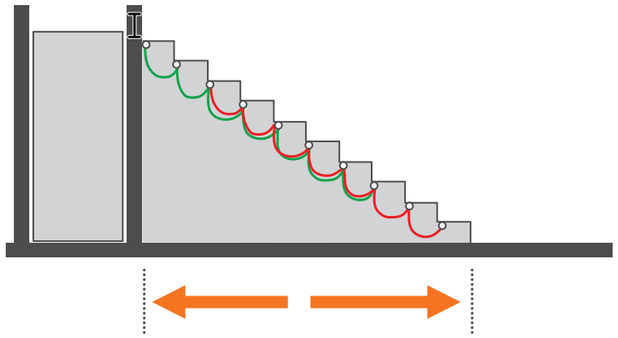
Kings Place, Kings Place Music Foundation, London, UK is fitted with Ampetronic hearing loop systems

Low spill MultiLoop™ Drivers	
C Series	C5-2 Networkable
	C7-2 Networkable
	C10-2 Networkable
	C14-2 Networkable

Pictures for illustration purposes only.

In many educational multipurpose spaces e.g. gymnasiums retractable seating has been installed to allow for maximum seating capacity in a space not exclusively used for seated activities. Ensuring a consistent Loop signal is maintained when installing a Hearing Loop system in retractable seating is best achieved by installing the loop system into the actual seating structure.

Low loss MultiLoop™ layouts are ideal for large areas in excess of 6m wide with metal loss due to the metal structure of the retractable seating.



The **low loss MultiLoop™** design also ensures that an even signal is achieved when retractable seating is in situ and that all parts of a multipurpose room can be used at all times, regardless of configuration.

Retractable seating

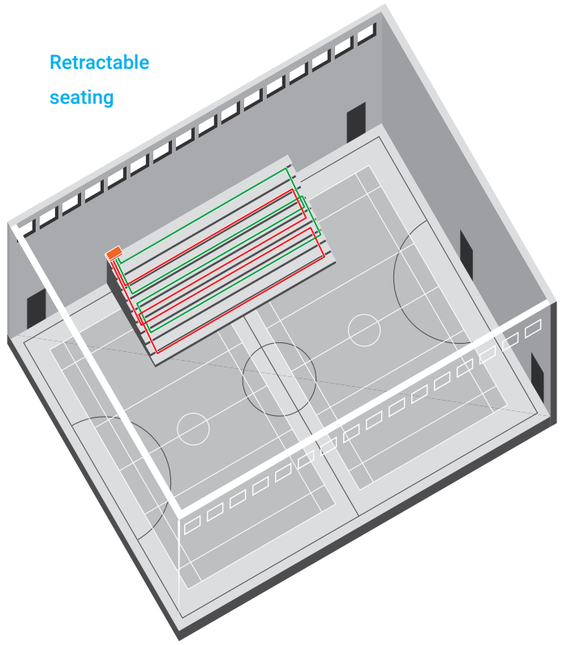


Illustration shows a low loss multiloop installed in retractable seating.

Low loss MultiLoop™ Drivers	
C Series	C5-2 Networkable
	C7-2 Networkable
	C10-2 Networkable
	C14-2 Networkable

University of Dundee, UK use an Ampetronic, Low Loss MultiLoop™ with retractable seating

Pictures for illustration purposes only.

Reception areas and service points

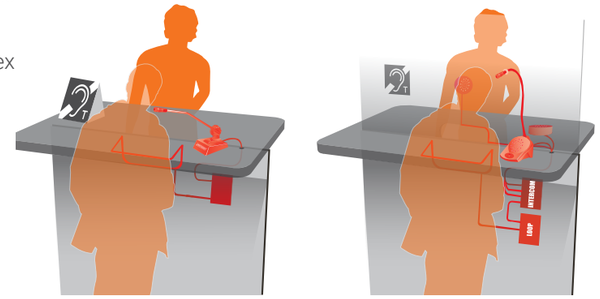
Dealing with background noise when faced with a busy reception desk, can be a challenge for a person with hearing loss. Distance from receptionist can also cause frustration.

When combined with a preformed loop and microphone, **Ampetronic™ CLD1 service point** amplifiers, provide a 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 incorporate a microphone and speaker at each side of the screen, connected to a duplex amplifier which can resolve issues of background noise and problems 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 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.

Ampetronic's TalkPerfect solution offers effective communication through physical barriers, supporting privacy and security in a robust and easy to use system.



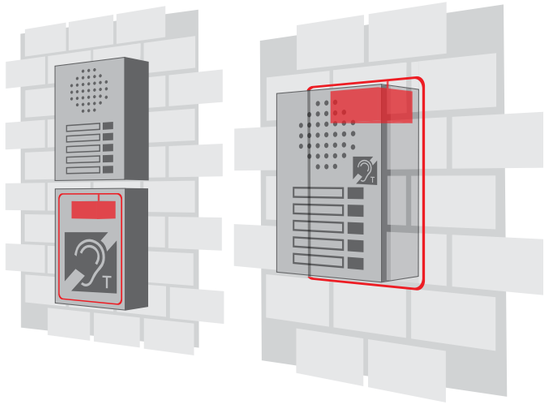
University of Aberdeen, reception desks and service points are fitted with Ampetronic speech transfer counter solutions.

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

Pictures for illustration purposes only.

Door entry, access and help points

Hearing loops can be used at any automated service point where visitors communicate indirectly with staff, often in a noisy environment. The nature of a system can depend on exact application.



Ampetronic™ original equipment manufacturer (OEM) intercom solutions, are designed to provide full area coverage by driving a single or multi-turn loop around the perimeter of standing area. An amplifier is normally housed within the device enclosure, and the loop itself is generally installed by cutting a channel into nearby 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 standing distance from the loop. However, they are often a simple solution for installation and can be located around the edge of device enclosure recessed into brickwork.

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

Door entry intercoms	
HLS Series	HLS-DM2

London Underground Help Points are speech transfer systems which include Ampetronic's hearing loops.

Pictures for illustration purposes only.

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.

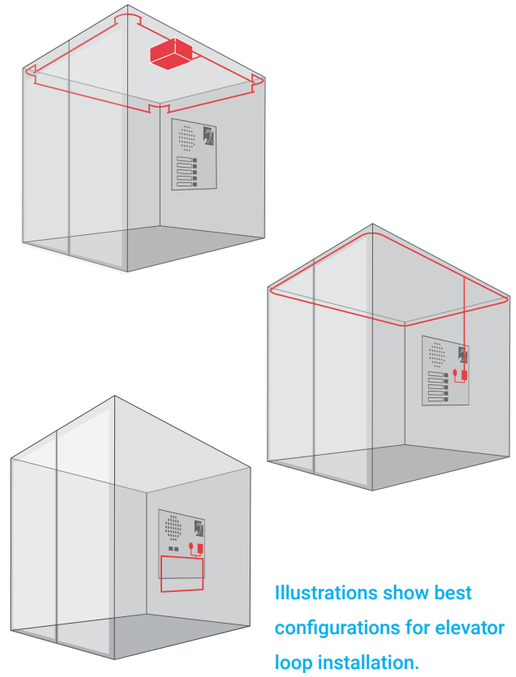
There are two standard options for the loop itself:

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.

Elevator intercoms or help points	
HLS Series	HLS-DM2



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.

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 types	Product ranges
Lecture halls and theatres	Simple perimeter loop	C Series (single)
	Cancellation loop	
	Single array	
	Low loss MultiLoop™ (for 6m wide spaces with metal structure)	C Series (dual)
	Low spill MultiLoop™ (when there are other loop systems nearby)	
Stand-alone classrooms, meeting rooms and laboratories	Simple perimeter loop	C Series (single) CLS
	Single array	
	Low loss MultiLoop™	C Series (dual)
Adjacent, divisible and complex multipurpose rooms	Low loss MultiLoop™	C Series (dual)
	Low spill MultiLoop™	
Reception areas and service points	Open service point	CLD1 CLS
	Security window service point	CLD1 CLS TalkPerfect
Door entry, access and help points	Door entry 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.com**

Pictures for illustration purposes only.

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 there is a good guide to what is both suitable and necessary:

Signage recommendations	
Application	**Recommended signage requirement**
Room area coverage system (theatre, waiting area, classroom)	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

Pictures for illustration purposes only.

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.com**

Loopworks®
LEARN • COLLABORATE • MEASURE • DESIGN

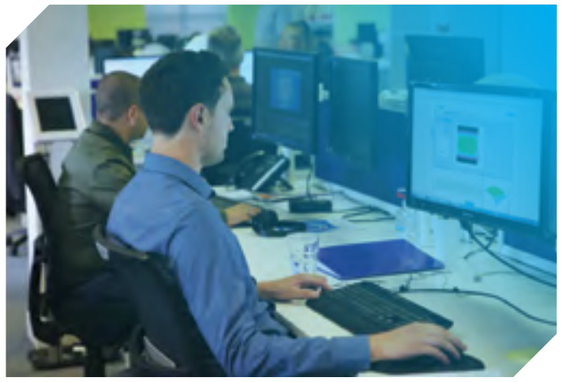
Training

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:

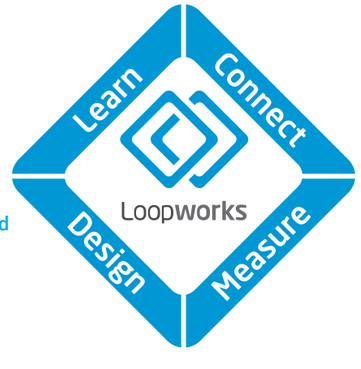
Learn from the latest information, developments and support from the worlds' most credible information sources.

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.



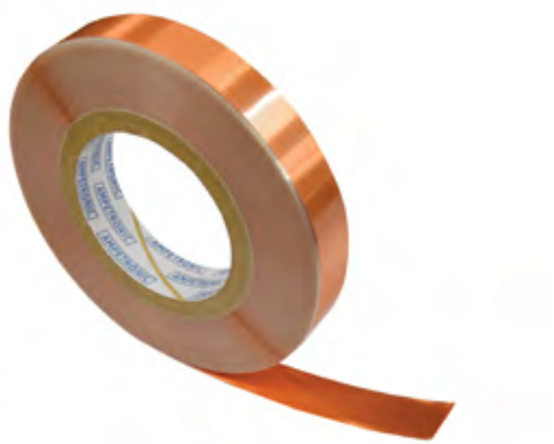
Accessories, receivers and measurement systems

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

Pictures for illustration purposes only.



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.com or buy one directly from our website at www.ampetronic.com/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)

UP30083-4

Providing a genuine benefit.

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

AMPETRONIC®

Listen to the difference

Unit 2, Trentside Business Village, Farndon Road,
Newark, NG24 4XB
United Kingdom

www.ampetronic.com