Corporate

Hearing loops
Application guide

AMPETRONIC®

Listen to the difference

Contents

Please note 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

Ampetronic™ Hearing Loops

- communicate directly with hearing aid users

- ensure effective interaction and increase productivity

- minimise uncontrolled information sharing

15 percent of the population suffer hearing loss. One in four of those use a hearing aid. Businesses and facility operators, can find themselves in an actionable position, if there is no service provision which is of a genuine benefit to hearing aid users. That is, there must be an accessible assistive listening system, and it must be fit for purpose.

Most hearing aid users would say that when they use their aids in one-to-one conversations, they work very well. Difficulties arise when a level of ambient noise is too great, as in an open office, or when distance between a speaker and a listener is increased for example, in a meeting room or conference hall.

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
- multipurpose rooms are in use e.g. partitioned conference halls
- overspill can cause interference or broadcast of the signal
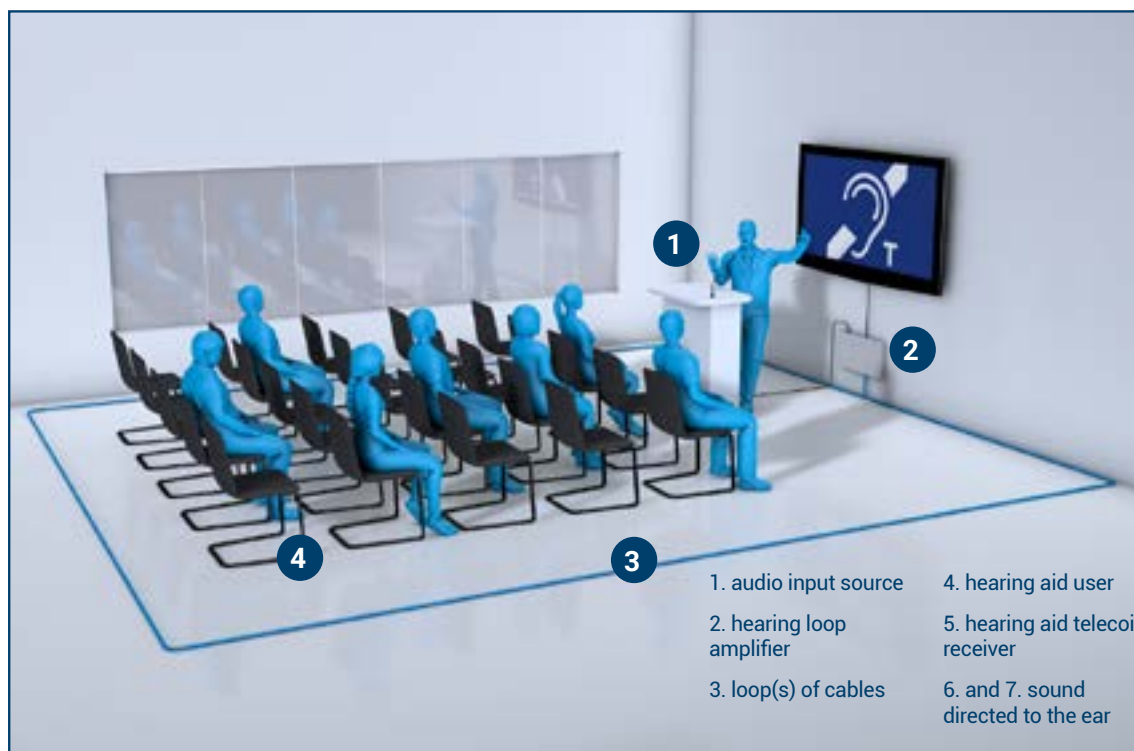- metal is present in the building structure or room contents

Ampetronic™ Hearing Loops:

- **offer direct communication to users via existing hearing aid, without need for additional receivers**
- **enable businesses to provide genuine benefit to hearing aid users, ensuring compliance to standards, and empowering users to become more interactive and productive**
- **reduce overspill and so reduce interference or possibility of broadcasting of sensitive information**
- **minimise the effects of metal in the structure**
- **allow freedom of movement by ensuring a consistent signal throughout the looped area**
- **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 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

1. audio input source

2. hearing loop amplifier

3. loop(s) of cables

4. hearing aid user

5. hearing aid telecoil receiver

6. and 7. sound directed to the ear

For more information on developing hearing loop systems please call our experts for assistance on **+44 (0) 1636 610062**
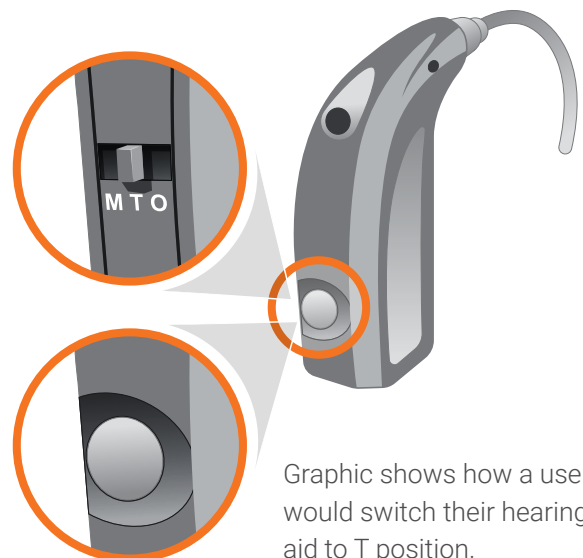
A hearing loop, also known as an induction loop or T-Loop, is an inherently simple assistive listening system, which provides access to facilities for those with a hearing impairment.

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 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.

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.

Stand-alone office space and boardrooms

Ampetronic™ Hearing Loop solutions are perfect for working environments, and provide equality of access to essential audio services and sound reinforcement for colleagues with hearing loss. Such solutions enable all users to be as productive as possible, with minimum effort or intervention.

The loudness of a sound decreases by six decibels for every doubling of distance. Therefore, any audience member typically sat past the third row, 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 structures. An Ampetronic™ **hearing loop** can help a hearing aid user overcome these limitations.

For smaller areas without metal in 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™** provides more consistent coverage than a simple perimeter loop or single array, when there is metal in building structure. If there are multiple areas to be covered in close proximity to each other, or there is a requirement to limit signal overspill from sensitive meetings, **low spill MultiLoop™** systems are recommended to reduce signal cross over.

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.


Macquarie Bank, London, UK is fitted with Ampetronic hearing loops

Single array

Low loss
MultiLoop™

Low spill
MultiLoop™
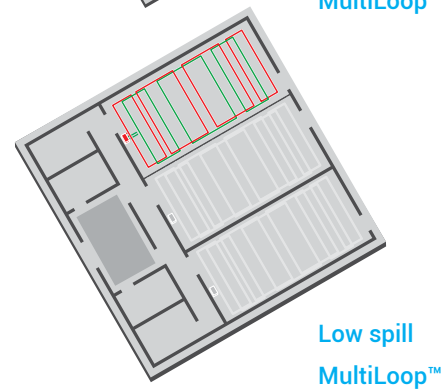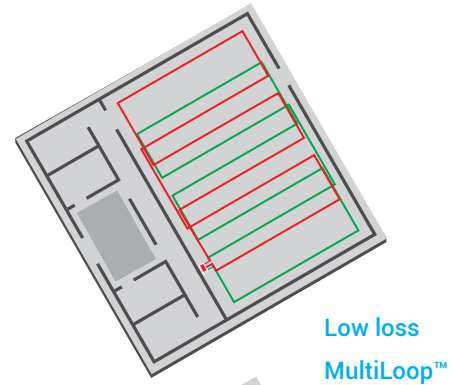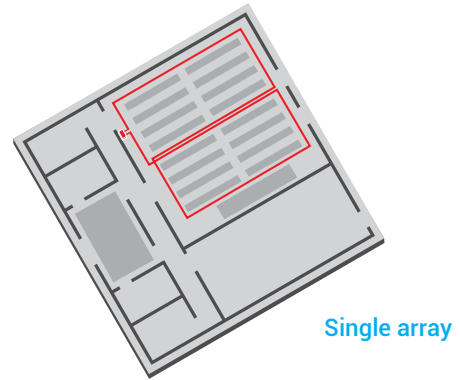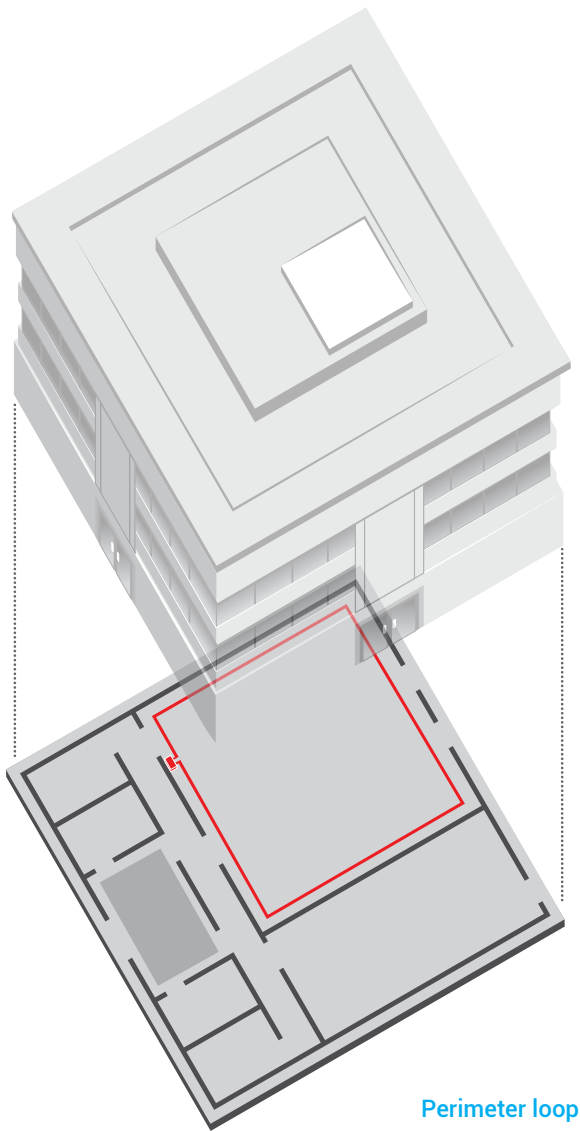
Perimeter loop

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
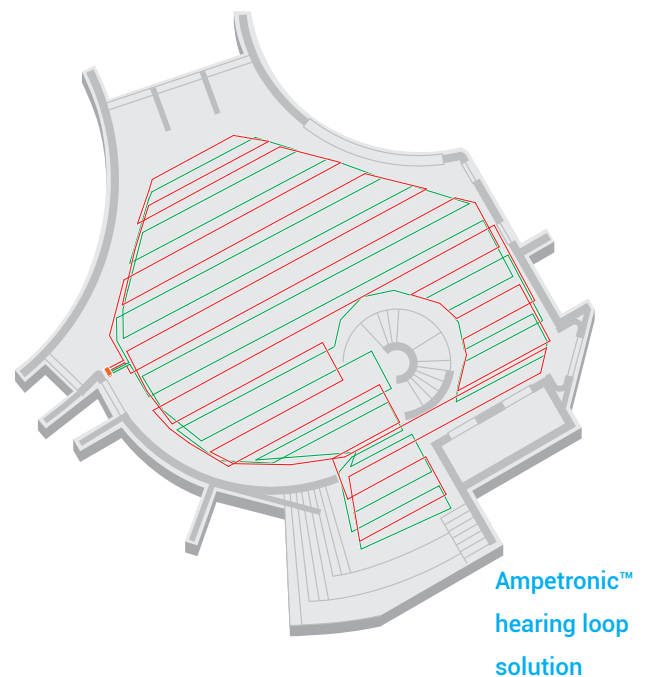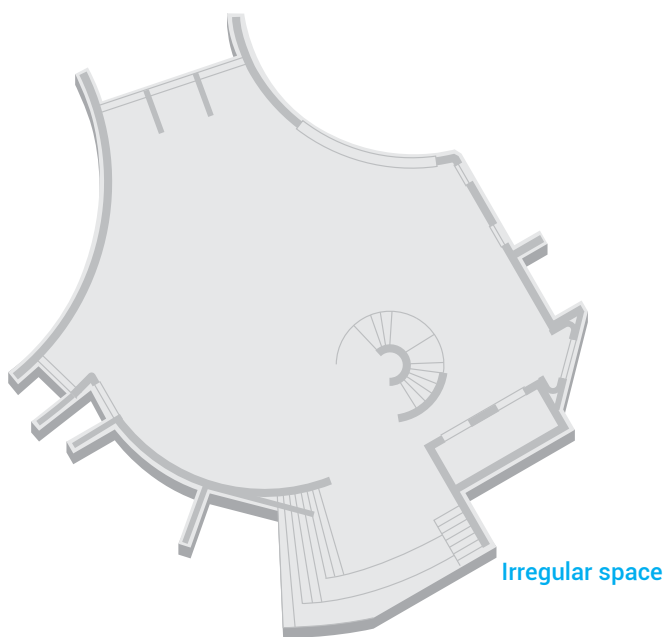
In addition to stand-alone rooms and offices there are very often a number of areas that do not conform to simple geometry.

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 hearing loop systems please call our experts for assistance on **+44 (0) 1636 610062**

Most diverse meeting and learning environments will have a need to be multipurpose. Such rooms will often have several unique installed systems, all designed to work independently, known as closed mode, and in synchronisation with each other, known as 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. This configuration would suit a space where prevention of overspill is required to minimise any crossed signals for example, a multipurpose meeting or training room.

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

With the space opened up, minus the room divider the **low spill system** works with the **low spill, MultiLoop™** systems installed in the adjacent rooms to combine as one, **low spill, MultiLoop™** system. This configuration could accommodate a variety of meeting scenarios including training, conferences and break out activities.
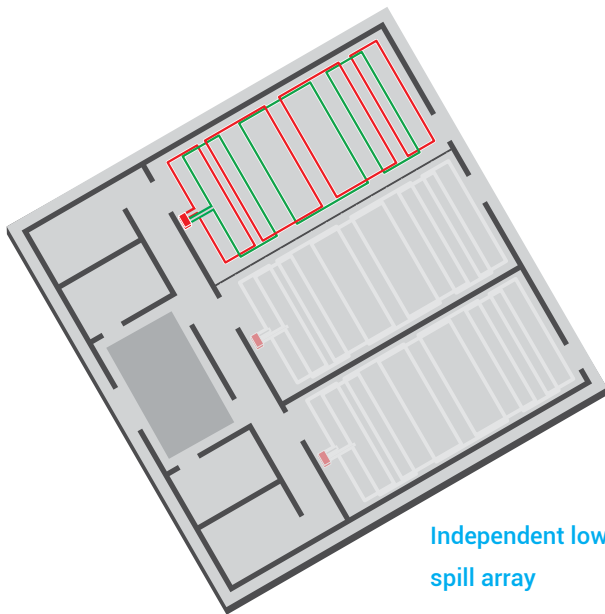
Independent low spill array
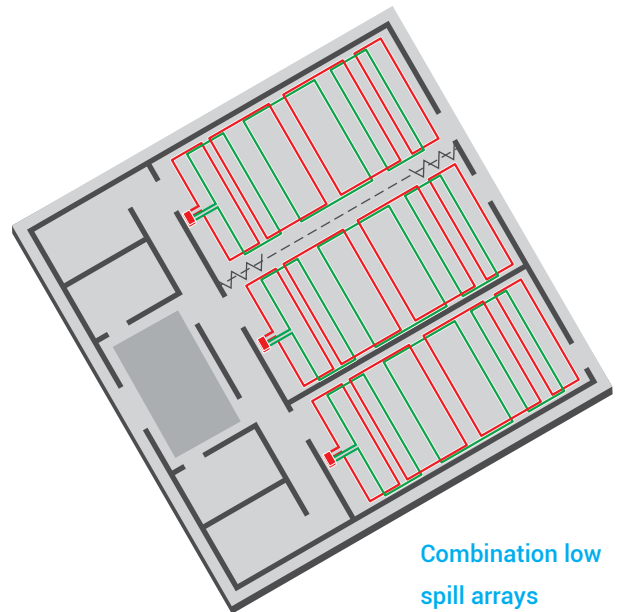
Combination low spill arrays

Deloitte Offices, UK are fitted with Ampetronic hearing loop systems.

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

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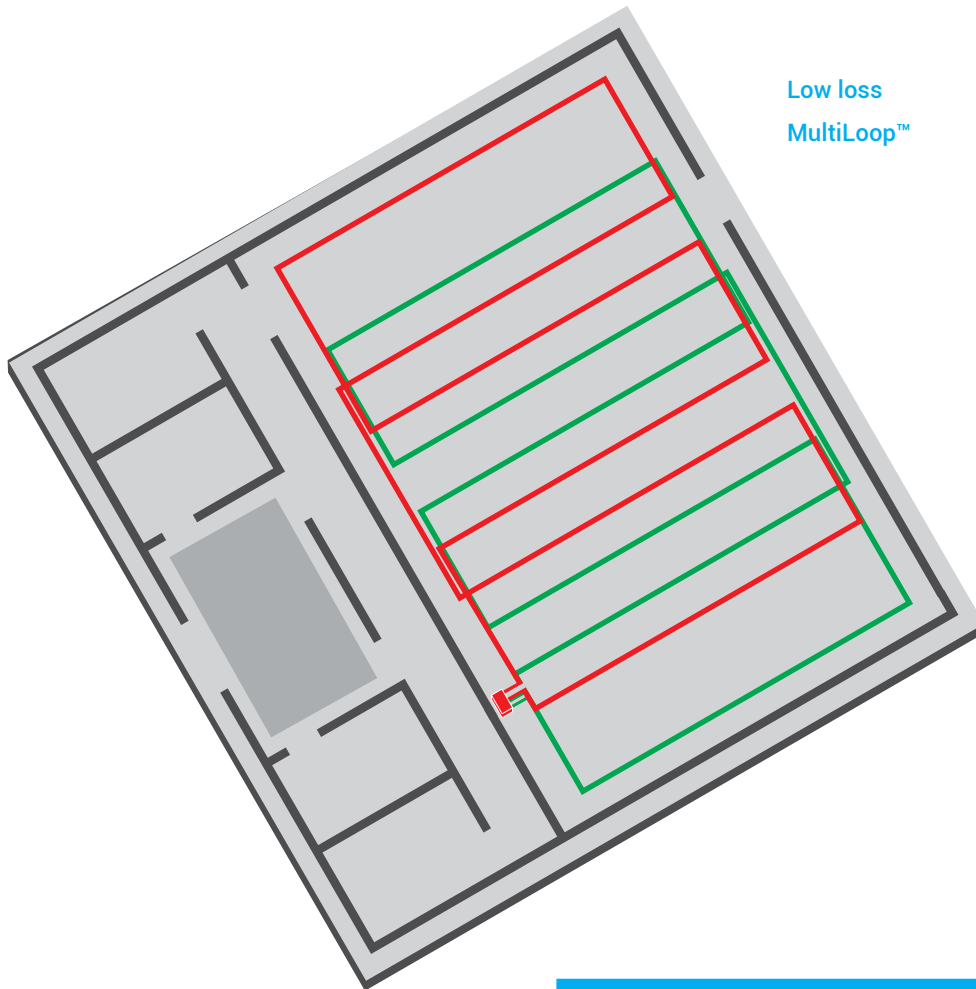
Low loss
MultiLoop™

The Hoftoren, The Hague, The Netherlands
is fitted with Ampetronic hearing loops.

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

Product range guide

| Series	Description	Product	Configuration(s)	Recommended usage
C series	The C Series hearing loop drivers from Ampetronic mark a substantial development in assistive listening technology; offering performance, consistency and certainty of results, for the price of a mid-range driver.	C7-1 Networkable C5-1 Networkable	• Perimeter loop • Single array • Cancellation loop	• Environments containing little or no metal in the building structure • Where networking and remote access are needed • Where there are no concerns about the signal boundary • Simple installation
	Simple digital interface for accurate setup and adjustment. Low running and maintenance costs.	C7-2 Networkable C5-2 Networkable	• Low loss MultiLoop™ • Low spill MultiLoop™	• Environments containing high levels of metal • Where signal overspill is an issue • Where networking and remote access are needed
D series	The D series represents the global benchmark for digital audio hearing loop systems. With digital signal processing and networking functionality they are the most versatile and powerful solution available.	D10-1 Networkable D10-1 Networkable and Dante	• Perimeter loop • Single array • Cancellation loop	• Small, medium and large areas • Environments containing little or no metal in the building structure • Where networking and remote access are needed • Where there are no concerns about the signal boundary • Simple installation
	The drivers in this series feature capacitive touch front panels with intuitive menus, built in test signals, and are fully networkable with a Wi-Fi accessible standard browser based control panel for remote set-up, monitoring and email alerts.	D14-2 Networkable D14-2 Networkable and Dante D10-2 Networkable D10-2 Networkable and Dante D7-2 Networkable D7-2 Networkable and Dante	• Low loss MultiLoop™ • Low spill MultiLoop™	• Large and complex areas • Environments containing high levels of metal • Where signal overspill is an issue • Where networking and remote access are needed
MLD series	The MLD9 provides the highest output available in any dual channel loop driver and is capable of driving a wide variety of multiple loop configurations from multiple simple loops to phase shifted array systems for the most challenging requirements.	MLD9 MLD7 MLD5	• Low loss MultiLoop™ • Low MultiLoop™ spill	• Large and complex areas • To compensate for high losses due to metal structures • Where the signal needs to be confined to within 1.5m of looped area to prevent overspill
ILD series	The ILD series is a professional audio hearing loop driver with an unsurpassed clarity of sound for both music and speech for superior intelligibility. Improved power output provides outstanding value without compromise.	ILD1000G ILD500 ILD300 ILD122	• Perimeter loop • Single array • Cancellation loop	• Small, medium and large areas • Environments containing little or no metal in the building structure • Where there are no concerns about the signal boundary • Simple installation
CLD series	The CLD1 is the smallest and highest performance amplifier in it's class.	CLD1 CLD1-AC	• Multi-turn loop coil	• Counter systems
CLS series	Designed for simple discrete installation, the CLS range offers the most capable solution in its class.	CLS1 CLS2	• Counter loop system	• Small and medium areas • Environments containing little or no metal in the building structure • Where there are no concerns about the signal boundary • Simple installation of a wall mounted perimeter loop
HLS series	The Hearing Loop System Driver Module is an advanced hearing loop driver designed to be integrated into communication systems such as elevators, intercoms, help points and kiosk systems.	HLS - DM2	• Integration	• Elevators • Intercoms • Help points • Kiosk systems
Speech transfer	Ampetronic™ speech transfer systems offer communication through physical barriers supporting privacy and security in a discreet, robust and cost effective package.	Talk Perfect DSP	• Duplex intercom	• Secure or partitioned desks, kiosks and reception areas

Presentation AV equipment integration

It is important to connect all audio services within a room to the hearing loop system so hearing aid users are not excluded from any part of a meeting or presentation. This often means connecting an AV system as well as dedicated microphones.

A functional hearing loop system that provides a genuine benefit to its users and fulfils all the requirements of the international performance standard consists of 5 main components.

1. An audio source, such as a microphone or AV system
2. A hearing Loop Amplifier or driver
3. Copper 'loop' cable, and fitting accessories
4. Signage and notification
5. Receiver and testing equipment

To configure a loop system to work with your presentation or A/V system connect the line out of the A/V system to the Line Level Input on the hearing loop driver (using an XLR, a ¼ inch jack, screw terminal, or CAT-5 for Dante™ connections depending on the driver in use).

Hearing loop solutions are often designed to deliver sound on a one-to-one or one-to-many basis. If you are considering using hearing loops in a conference room (a many-to-many application) it is recommended that the hearing loop is fitted as part of a conferencing sound reinforcement solution so that only one voice is transmitted by the loop at any one time.
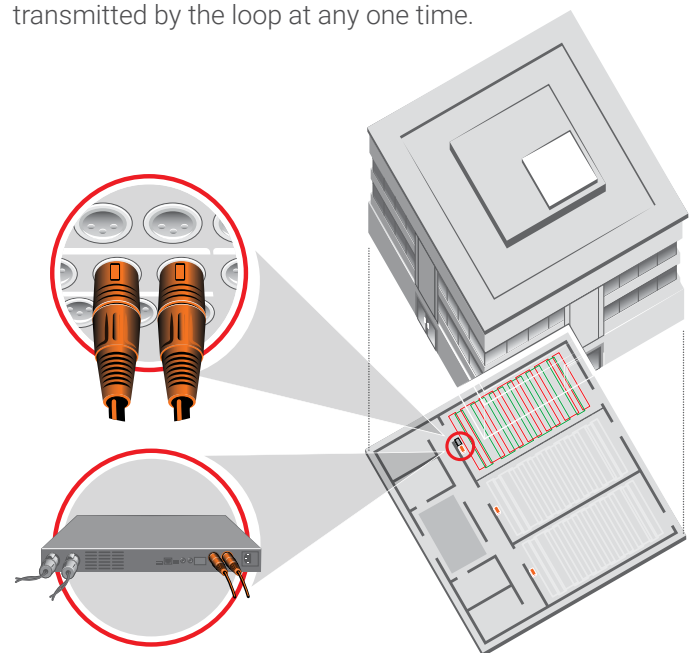
Illustrations show AV connections to a loop driver, and the relative position of a driver to a loop.
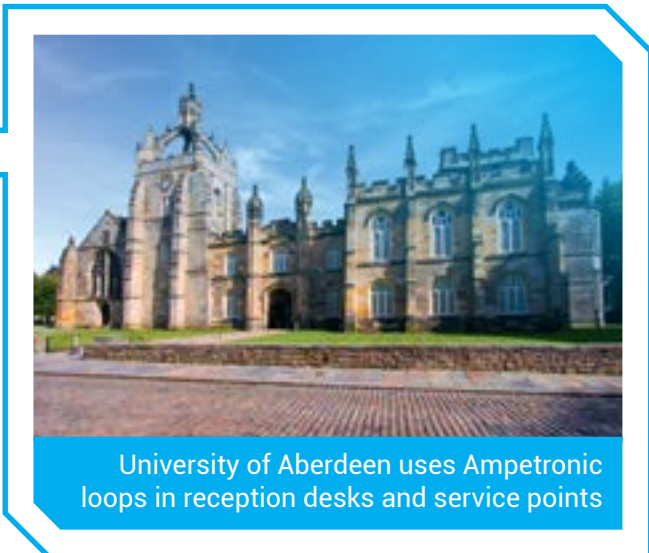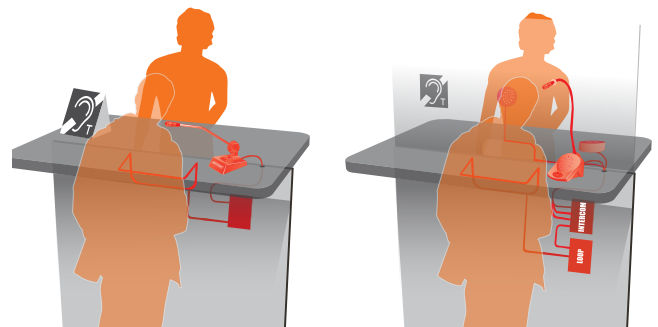
Reception areas and service points

Dealing with background noise when faced with a busy reception desk can be a challenge for a person with hearing loss. Distance from a 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 uses Ampetronic loops in 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

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 the intercom panel.
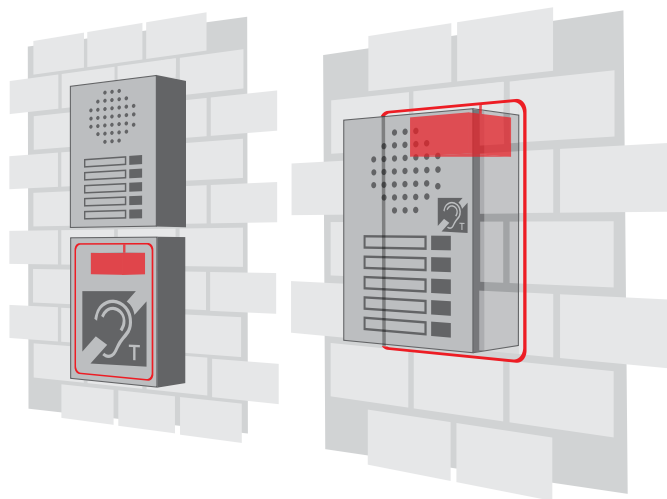
Door entry intercoms	
HLS Series	HLS-DM2

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

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 these small loops ineffective for large elevators, for use with a public address (PA) system, or for safety communications such as a voice evacuation system.
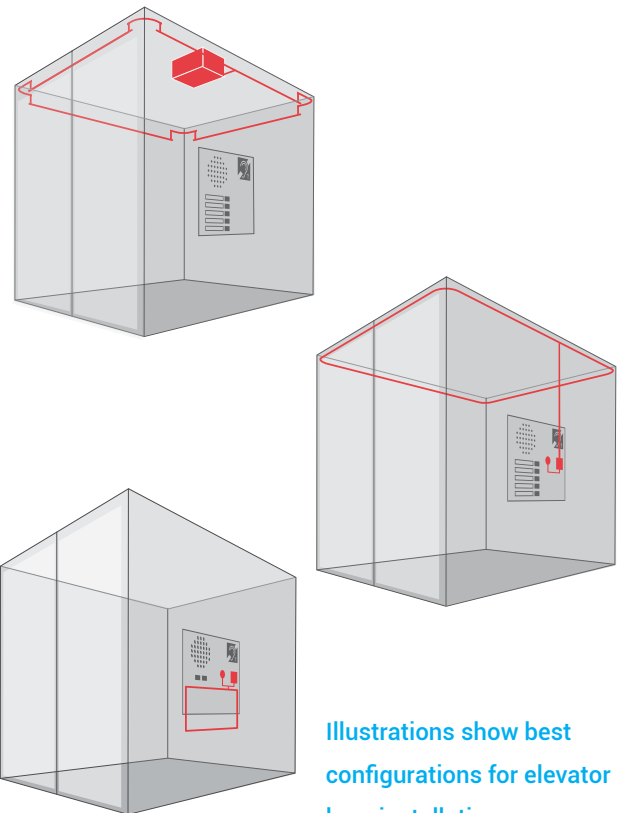
Illustrations show best configurations for elevator loop installation.

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 and amplification.

Elevator intercoms or help points	
HLS Series	HLS-DM2

Loop summary table

Useful quotation information

When requesting a quote our experienced and friendly staff will be able to guide you through the process, however if you do have the following information about your project it can help us to prepare an 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	Product range
Stand-alone office space	Simple perimeter loop	C Series (single) D Series (single)
	Single array	ILD Series CLS Series
	Low loss MultiLoop™ for spaces greater than 6m wide, with metal structure)	C Series (dual) D Series (dual) MLD Series
	Low spill MultiLoop™ when there are other loop systems nearby	
Complex multipurpose offices and board rooms	Low loss MultiLoop™	C Series (dual) D Series (dual) MLD Series
	Low spill MultiLoop™	
Reception areas and service points	Open service point	CLD1 CLS Series
	Security window service point	CLD1 CLS Series TalkPerfect
Door entry, access and help points	Door entry intercoms	HLS Series
Elevators	Elevator intercoms and 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 there is a good guide to what is both suitable and necessary:

Signage recommendations	
Application	**Recommended signage requirement**
Room area coverage system, for offices, waiting areas, training rooms	A sign 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 within the looped space. 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 for service points, reception desks	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, for entry points	A small sign at a level where it is visible to a person pressing an 'intercom', 'information' or 'help' button

System design support and training

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

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 the same project, will attract only one charge. Simple perimeter loop installation designs will not be charged for.

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**

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:

UK: +44 (0) 1636 610062, or
outside UK: +44 (0) 1636 602161.

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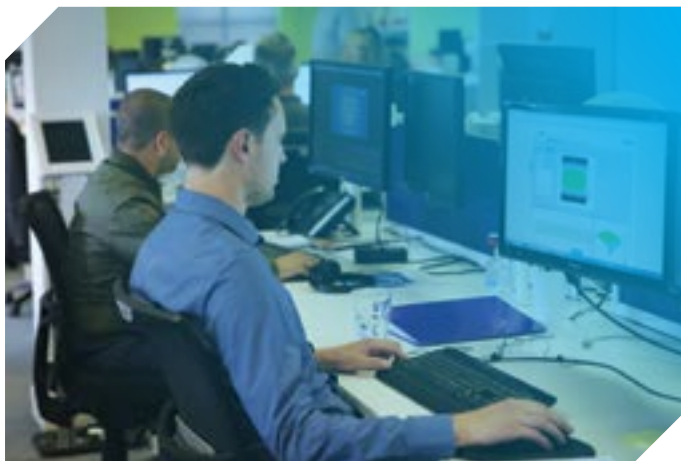
Loopworks™ suite

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.
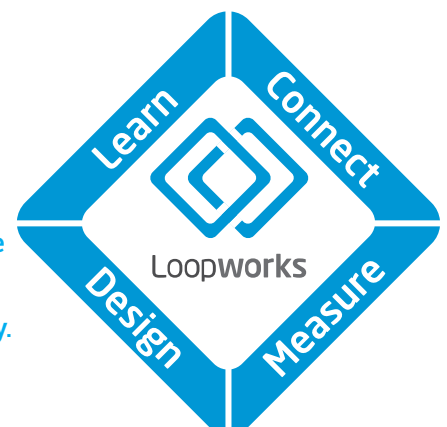
Accessories, receivers and measurement systems

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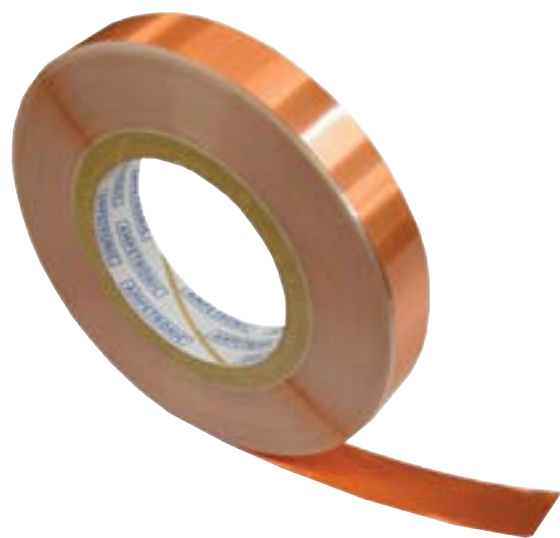
Ampetronic manufactures a range of market leading cables and copper tape for creating loop systems.

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 with 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)

UP30082-2

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.co

AMPETRONIC ®

Listen to the difference
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