

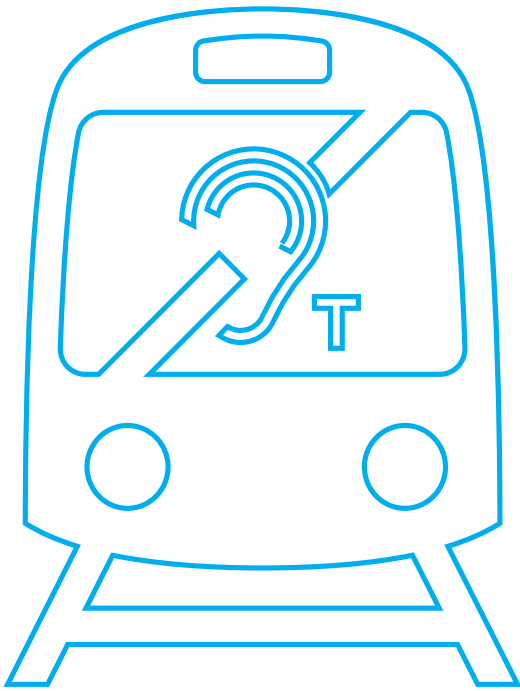


On-board Transport Systems

Hearing Loop solutions

AMPETRONIC®

Listen to the difference



With decades of experience delivering first-class results in some of the world's most famous rail, subway, tram and taxi networks, Ampetronic is the recognised world leader in Hearing Loop technology designed to allow people with hearing loss to make use of on-board audio services.

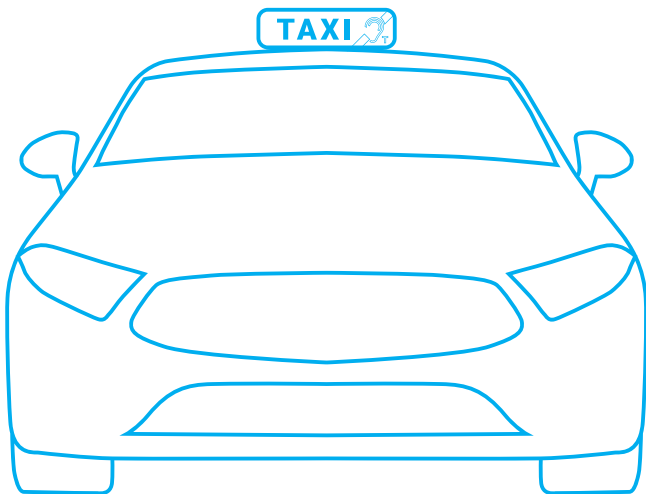
Ampetronic has a long-standing history of partnering with the world's leading rolling stock, taxi and bus manufacturers.

We provide our partners with the assurance that not only will their Hearing Loop solution function as intended, but also that all procedures, detailed documentation processes and stringent safety and compatibility standards as required by major development projects, are completed diligently and punctually.

Ampetronic on-board transport Hearing Loop systems will not only perform to the internationally recognised IEC 60118-4 Standard, but also be durable enough to continue operating for years to come, providing a genuine benefit to the hearing aid user.

With dedicated design and product solutions for almost any application, we also regularly undertake projects to design and develop custom systems for novel applications.

If you have an interest in an application beyond our standard range of products and services, please contact us – we will be pleased to discuss your requirements!



For more information on hearing loops and assistive listening call **+44 (0)1636 610062** or visit **www.ampetronic.com**

Why hearing loops?

Every day, millions of people with hearing loss utilise public transport and they require assistance to make use of on-board public announcements and emergency broadcasts.

Whether they are travelling for work or leisure purposes, if they are a hearing aid user, they will need support to make use of on-board audio services and can legally expect to have equality of access to them.

Despite digital advancements, modern hearing aids are still primarily designed for 1 to 1 communications over short distances. This makes separation of environmental background noise and the sound the user wishes to hear difficult or impossible, when relying on the hearing aid microphones alone. With the addition of distance to the sound source the problem can be further exacerbated.

To enable people with hearing loss to make use of voice communication systems when they are out and about, it is essential that they are provided with equal access to the same public address services, intercoms and emergency announcements, that any other service user would expect. Without this many choose not to travel at all as the experience can be too difficult.

Statistics from around the world reveal that currently more than 1.5 billion people (nearly 20% of the global

population) experiences some form of hearing loss, this number could rise to over 2.5 billion by 2030. Around 1 in 4 of those people will be using hearing aids. This significant section of our society is protected by antidiscrimination legislation (varies dependent on each country) which requires service operators to make reasonable adjustments to their services to cater for them using “Assistive Listening” technology.

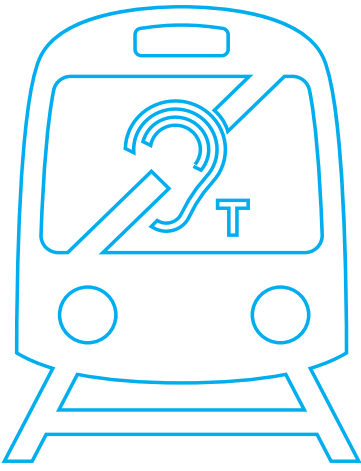
In transport environments, where the users are transient and there is no practical capacity to hand out receivers, Hearing loops which work directly with a hearing aid user’s telecoil become the only practical assistive listening technology for this application.

Having considered the moral and antidiscriminatory rationale for installing a high-quality Hearing Loop, it’s also important to consider Standards compliance. Facility operators can find themselves in an actionable position if there is no service provision that is of a genuine benefit to users. In other words, the installation must be fit for purpose. The measurable performance of a Hearing Loop system is defined in the international IEC 60118-4 Standard, so it is imperative that a well-designed and fully functional system is installed.

UK Population of travellers with hearing loss

UK rail travel demographics			2021			2031		
Age group	Rail Passenger Demographics ¹	% with hearing loss ²	Population ³ (UK)	Travellers	Travellers with hearing loss	Population ³ (UK)	Travellers	Travellers with hearing loss
15-24	30%	3.6%	7,802,791	2,340,837	84,270	8,754,753	2,626,426	94,551
25-39	14%	3.6%	13,451,723	1,883,241	67,797	12,851,055	1,799,148	64,769
40-54	12%	6.5%	12,975,941	1,557,113	101,212	13,188,271	1,582,593	102,869
55+	8%	40%	21,299,967	1,703,997	681,599	23,999,626	1,919,970	767,988
Total				7,485,189	934,878		7,928,136	1,030,177
% Pop. of travellers with hearing loss					12%			13%

1. <https://start.askwonder.com/insights/train-traveler-research-rwczeubmx#--text=Individuals%20over%2070%20make%20an,%25%20of%20those%20aged%2055%2B>
 2. http://www.thebsa.org.uk/wp-content/uploads/2015/09/Hearing_screening_in_adults_review-NSC.pdf
 3. 2018-based National Population Projections (ONS)



Rail & Tram, On-board Systems

There is an ever-growing requirement for assistive listening solutions on-board public transport. Service broadcasts and emergency announcements over rail and tram Public Address (PA) systems are now part of everyday life, and because of their direct connection to the user's hearing aid, Hearing Loops are the only assistive listening technology suitable for use on public passenger vehicles.

Hearing aid users who are on public transport benefit from on-board Hearing Loop systems as background noise levels are particularly high, and the listener may be a significant distance from any PA speakers. For example, a direct connection between a user's hearing aid and a train or tram PA system is invaluable when assessing what the next stop is on an unfamiliar route.

Build quality of the loop equipment is particularly important in vehicle applications because of the inherent vibration and temperature changes that any integrated system will be subjected to. Ampetronic has established products designed specifically to overcome these issues and has a proven track record with established manufacturers such as Nissan, Hyundai Rotem, ALSTOM and others.

Products

T14-1 Transport hearing loop driver



Applications

In a rail or tram carriage, the floor, walls, and roof are usually constructed from metal. To minimise the attenuation of the magnetic field caused by metal loss, it is most common to place the loop around the upper part of the wall. This is usually some 300mm below the roof height to reduce signal loss due to metal construction. The best location will depend on the exact vehicle design. It is preferable to loop the entire carriage/car (see figure 1.) where possible, so as not to discriminate by separating hearing-aid users from their travelling companions.

If it is not possible to loop the entire carriage then sections of each carriage can be covered, usually the same areas reserved for wheelchair access (see figure 2).

However, this is also regarded as discriminatory as it often segregates people with hearing loss and also saves very little cost or time.

- Train and Metro/Underground carriages
- Trams
- Funicular or cable car carriages.

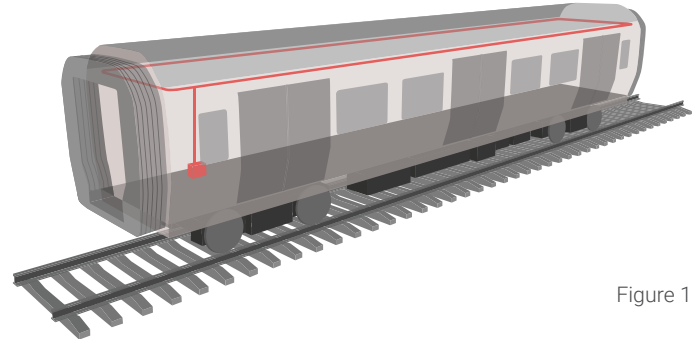


Figure 1

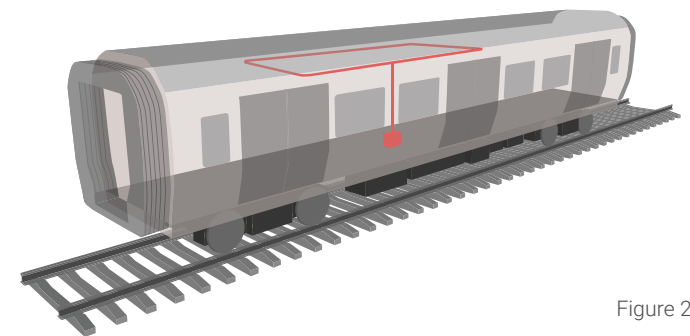


Figure 2

Intercoms on-board

Being able to communicate clearly and efficiently with train personnel can be of utmost importance when using public transportation. This becomes particularly useful when the communication is remote, using an intercom. Ampetronic intercom solutions are designed to be integrated into communication systems to allow simple connections to onboard intercom systems. This integration will allow passengers with hearing impairment to communicate clearly and efficiently with staff.

Application notes:

Metal Loss

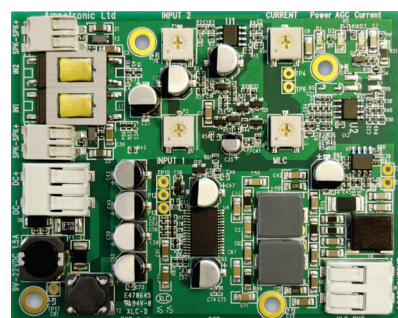
Most trains and trams are constructed from metal - the body shell is usually metal panels with frames and structural supports. Although the interior may use non-metal panels, an induction loop installed inside such a vehicle will experience significant loss of energy and changed frequency response.

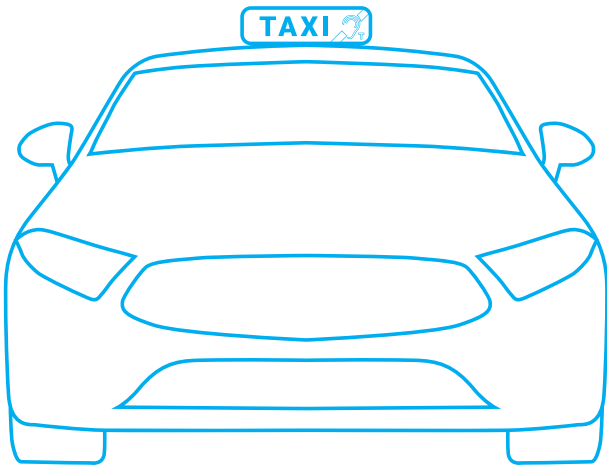
System Testing

Metal loss will always vary as each vehicle design has a different metal construction. The only reliable way to accurately determine the metal loss, which determines the loop configuration and current requirement, is to measure the performance of a trial loop installation in a vehicle of the same, or very similar design.

As most vehicle applications require high standards of safety and EMC compliance, Ampetronic gives bespoke advice to its transport customers.

HLS-DM2 Compact Class D Hearing Loop Driver





Taxis & Minibuses

There is an ever-growing requirement for assistive listening solutions on-board public transport. Passenger/driver communication via an intercom is now commonplace in taxis as security screens become popular, and because of their direct connection to the user's hearing aid, Hearing Loops are the only assistive listening technology suitable for use on public passenger vehicles.

Hearing aid users who are on public transport benefit from on-board hearing loop systems as background noise levels are particularly high, and the listener may be a significant distance from any PA speakers. For example, a direct connection between a user's hearing aid and a minibus' PA system is invaluable when assessing what the next stop is on an unfamiliar route.

Build quality is particularly important in vehicle applications because of the inherent vibration and

temperature changes that any integrated system will be subjected to. Ampetronic has established products designed especially to overcome these issues and has a proven track record with established manufacturers such as Nissan, Hyundai Rotem, and ALSTOM.

Products

TP-DX-N TalkPerfect speech transfer system



HLS-1A hearing loop system



Applications

In taxis and minibuses, the floor, walls, and roof are usually constructed from metal. To keep away from metal near the plane of the loop (and thereby minimise loss of energy), it is most common to place the loop around the roof lining of the passenger area to reduce signal absorption due to metal loss. In taxis and minibuses, it is preferable to install the loop around the roof lining of the passenger area, providing coverage in any seating position (see figure 3).

- Public hire (hailed taxis) and private hire (minicabs) taxis
- Minibuses (school, hospital clipper, leisure vehicles)

Ampetronic duplex intercoms can also be used if a security screen is present in the driver cab. The Ampetronic TalkPerfect amplifier (equipped with a loop as part of the system) can be installed on the bulkhead below the security screen.

TalkPerfect provides a fully integrated intercom and control module, with a host of features for integration and versatility (See figure 4).

Application notes:

Metal Loss

Most minibuses and taxi vehicles are constructed from metal - the body shell is usually metal panels with frames and structural supports. Although the interior may use non-metal panels, an induction loop installed inside such a vehicle will experience significant loss of energy and changed frequency response, which can be overcome with careful system design and installation.

System Testing

Metal loss will always vary as each vehicle design has a different metal construction. The only reliable way to accurately determine the metal loss, which determines the loop configuration and current requirement, is to measure the performance of a trial loop installation in a vehicle of the same, or very similar design.

As most vehicle applications require high standards of safety and EMC compliance, Ampetronic gives bespoke advice to its transport customers.

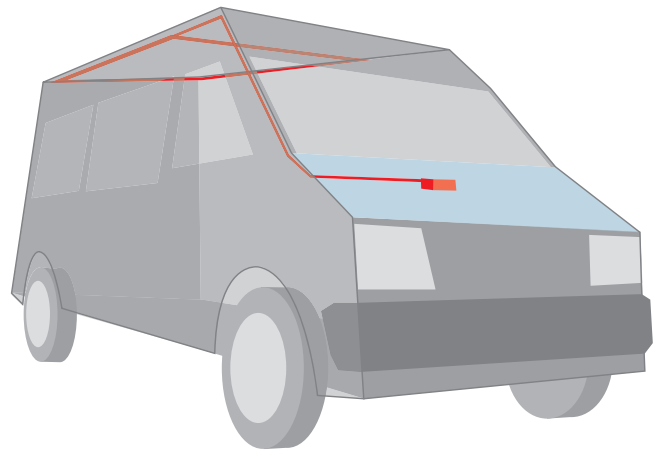


Figure 3

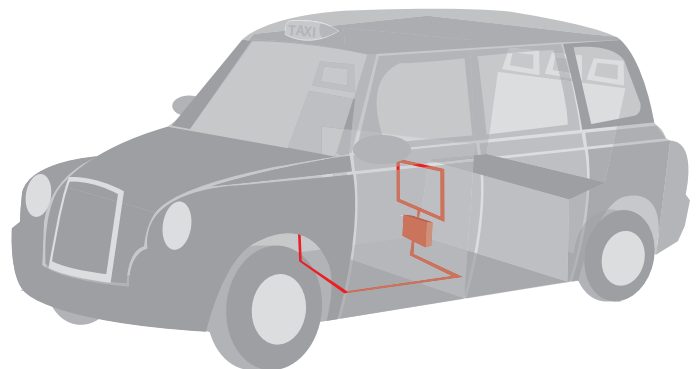


Figure 4

UNECE R10

The UNECE R10 regulation is about electromagnetic compatibility for the automotive industry. It states that every vehicle and every electronic sub-assembly (ESA) that is sold in any of the UNECE member countries should be compliant with the UNECE R10 requirements. The Ampetronic range of solutions for the automotive industry includes UNECE R10 compliant products.

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Buses & Coaches

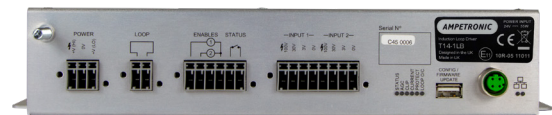
There is an ever-growing requirement for assistive listening solutions on-board public transport. Service broadcasts and emergency announcements over bus and coach Public Address (PA) systems are now part of everyday life, and because of their direct connection to the user's hearing aid, Hearing Loops are the only assistive listening technology suitable for use on public passenger vehicles.

Hearing aid users who are on public transport benefit from on-board hearing loop systems as background noise levels are particularly high, and the listener may be a significant distance from any PA speakers. For example, a direct connection between a user's hearing aid and a bus/coach's PA system is invaluable when assessing what the next stop is on an unfamiliar route.

Build quality is particularly important in vehicle applications because of the inherent vibration and temperature changes that any integrated system will be subjected to. Ampetronic has established products designed especially to overcome these issues and has a proven track record with established manufacturers such as Nissan, Hyundai Rotem, and ALSTOM.

Products

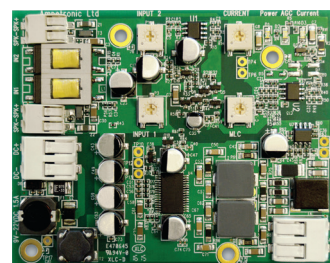
T14-1 Transport hearing loop driver



TP-DX-N TalkPerfect speech transfer system



HLS Series



Applications

In a bus or coach, the floor, walls, and roof are usually constructed from metal. To keep away from metal sheets near the plane of the loop (and thereby minimise loss of energy), it is most common to place the loop around the upper part of the wall. This is usually some 300mm below the roof height to minimise the impact of metal loss. The best location will depend on the exact vehicle design. It is preferable to loop the entire vehicle where possible, so as not to discriminate by separating hearing-aid users from their travelling companions.

In buses and coaches, it is preferable to install the loop around the passenger area, providing full signal coverage in any seating position (see figure 5).

- Single and double decker buses and coaches
- Articulated (bendy) buses, single and multiple cars

Driver/Passenger Communication

In busy environments where physical barriers or high background noise is present. A hearing aid alone may not provide adequate assistance to the user. In cases such as these, a small volume induction loop system should be used. This will enhance communication between the driver and passenger. In some cases, in particular on board public transportation there may be an additional requirement for acoustic uplift using a speech transfer system in addition to the loop (see figure 8).

Application notes:

Recommended installation - full area coverage

Double Decker Buses

With double decker buses, there is the additional challenge of two levels and two sets of passenger head height. Where the dividing floor is not constructed of metal, a single loop installation should cover the entire area (see figure 6). But if the dividing floor is of metal construction, two loops may be required to overcome any loss of energy or changed frequency response caused by the metal re-enforcement (see figure 7).

Emergency Override

There will sometimes be a need for the vehicle driver to override any customer service announcements, for example in the case of an emergency. Ampetronic VOX switching sets priorities for amplifier input, and twin phono (RCA) inputs provide a simple interface to on-board PA equipment.

Metal Loss

Most buses and coaches are constructed from metal - the body shell is usually metal panels with frames and structural supports. Although the interior may use non-metal panels, an induction loop installed inside such a vehicle will experience significant loss of energy and changed frequency response. In most cases, this metal loss is manageable, with appropriate equipment, design and implementation.

System Testing

Metal loss will always vary as each vehicle design has a different metal construction. The only reliable way to accurately determine the metal loss, which determines the loop configuration and current requirement, is to measure the performance of a trial loop installation in a vehicle of the same, or very similar design.

As most vehicle applications require high standards of safety and EMC compliance, Ampetronic gives bespoke advice to its transport customers.

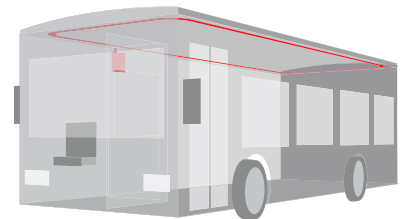


Figure 5

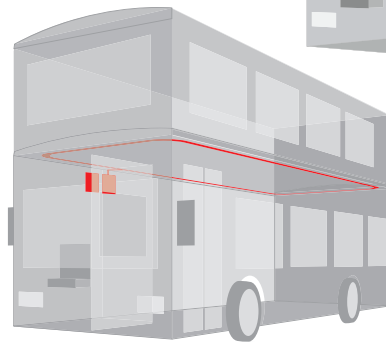


Figure 6

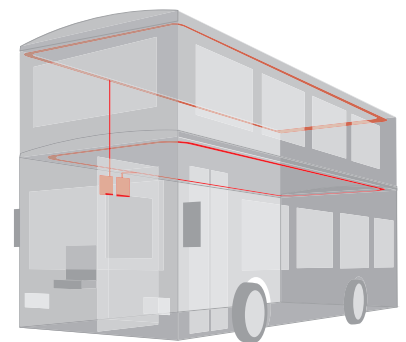


Figure 7

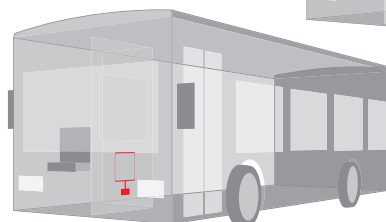


Figure 8



For more information on hearing loops
and assistive listening call
+44 (0)1636 610062 or visit
www.ampetronic.com



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

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