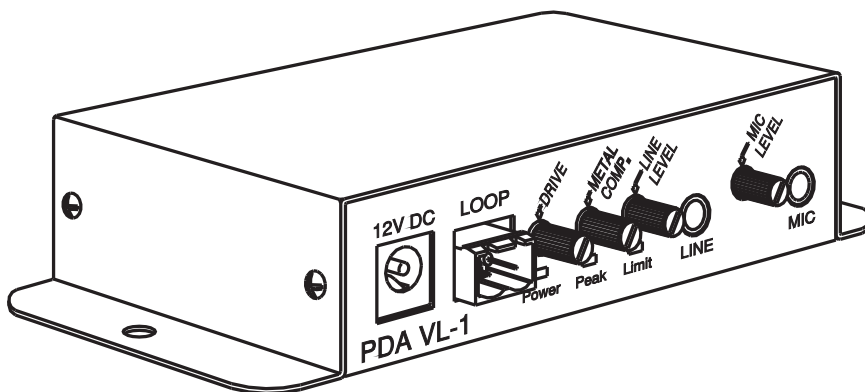


VL1

12V MINI AUDIO-FREQUENCY INDUCTION LOOP AMPLIFIER



The VL1 is a true current mode audio-frequency induction loop amplifier. Its compact design, 12V d.c. operation and availability in a variety of kit formats make it ideally suited for use in:-

- Cars, taxis, buses and other private/commercial vehicles (VL1/B1 or VL1/B2 kits)
- Ticket counters and other desktop applications (VL1/C kit)
- Access control applications (VL1/A kit)

In addition to this instruction manual, all of the above kits include Quick Start installation guides specific to the application(s) for which they are intended. These guides should always be referenced in conjunction with this manual prior to installation.

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IMPORTANT NOTES

This equipment must be installed by a suitably skilled and technically competent person.

These instructions are general and cannot be considered to cover every aspect of audio-frequency induction loop system design and installation.

We recommend you also read BS7594 - The Code of Practice for Audio-Frequency Induction Loop Systems and EN60118-4 - Magnetic field strength in audio frequency induction loop systems for hearing aid purposes (or any subsequent revisions), both of which are available from the British Standards Institute, 389 Chiswick High Road, London W4 4AL. Tel: +44 (0)20 8996 9000. Web: www.bsi-global.com.

Other National standards of design/installation/commissioning should be referenced where pertinent.

SAFETY PRECAUTIONS

Avoid placing the VL1 amplifier in areas:-

- with poor ventilation
- with high ambient temperatures
- with high humidity or dust levels
- exposed to direct sunlight
- adjacent to heat generating equipment
- susceptible to severe vibration

DO NOT dismantle or attempt to modify the amplifier in any way. No user-serviceable fuses or parts are included inside the amplifier. For repair, consult your supplier.

Ensure the loop cable and all relevant audio/microphone and power lead(s) are fixed securely into position before operation. Do not leave any trailing leads or obstructions.

The VL1 amplifier is capable of producing short-term peaks of twice its rated current.

WHAT IS AN AUDIO-FREQUENCY INDUCTION LOOP SYSTEM?



An audio-frequency induction loop system allows hearing impaired people to hear more clearly. Most hearing aids have a 'T' or 'MT' switch which allows them to pick up the electromagnetic field generated by an induction loop system. The hearing aid converts this signal into a sound suited to its user's specific hearing requirements. Any hearing impaired person positioned within or near the loop can hear the loop signal by

switching their hearing aid to the correct position, allowing them to participate more effectively in general conversation, ordering goods or services, etc.

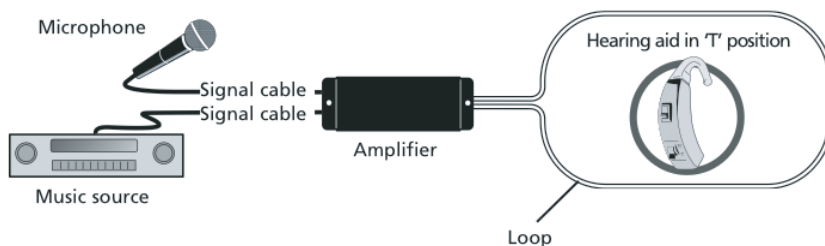
An induction loop system therefore comprises four main elements:-

The audio source – typically a microphone or a music source (or both).

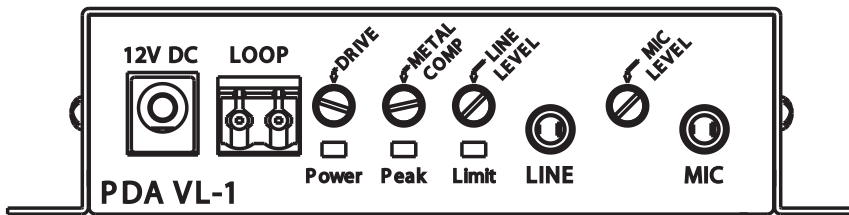
The induction loop amplifier

The loop – typically a single turn of wire run around the perimeter of the area requiring coverage or, on smaller systems, a special pre-formed loop fixed to a flat surface.

The receiver(s) – any behind-the-ear type hearing aid with a 'T' or 'MT' switch.



ABOUT THE VL1 INDUCTION LOOP AMPLIFIER



Below is a brief overview of the VL1's connectors, controls, indicators and operation.

Two inputs are provided on the amplifier:-

MIC (microphone): a 3.5mm jack input supplied with 9V phantom power for use with electret microphones. Dynamic microphones are NOT compatible with this input.

LINE: a 3.5mm jack input for the connection of an audio source such as a CD player.

The sensitivity of each input can be adjusted using the amplifier's LINE LEVEL and MIC LEVEL controls.

General operation:-

The amplifier mixes and amplifies the input signal(s) and feeds them through its sophisticated automatic gain control (AGC) circuitry before outputting them to the induction loop.

The induction loop connects to the amplifier via the two screw terminal connectors at the terminal marked LOOP.

The strength of the magnetic field generated by the induction loop can be adjusted using the amplifier's DRIVE control.

In applications with high metal content (i.e. loops fitted in vehicles), the amplifier's metal compensation control (METAL COMP) can be used to help combat the frequency response problems caused by metal 'absorbing' the magnetic field.

Three indicators are provided on the amplifier:-

The Peak indicator illuminates red in line with peaks in the input signal.

The Limit indicator confirms the AGC circuit is functioning. The rate at which it illuminates will depend on the signal being fed into the amplifier. If the signal is speech based, it will only light when someone is talking into the microphone. If the system is used to amplify music, it will normally be lit more constantly.

The Power indicator illuminates green when the amplifier is powered up.

The amplifier operates at 12V dc. Dependent on the application and VL1 kit purchased, this can be derived from a plugtop mains adaptor, a fused cigarette lighter adaptor or a local 12V power source and connection lead, all of which connect to the amplifier's 2.5mm 12V DC socket.

PLANNING AN INDUCTION LOOP SYSTEM - HINTS & TIPS

Induction loop system design and installation can be simple provided that a few basic facts are understood. To help avoid poor performance and the need to re-position the amplifier or loop cable at a later stage, we strongly recommend you refer to the information below and the example layout diagram(s) provided in our separate kit specific Quick Start installation guides.

Maximum area coverage

The approximate coverage provided by the VL1 amplifier using the TX2 pre-formed loop (as supplied in all VL1 range kits) is 1.2m² to 1.5m².

Loop cable position

The TX2 loop can be positioned either horizontally or vertically. In all instances, the exact position of the loop will depend on the application and the area requiring coverage - refer to the Quick Start installation guide supplied with your VL1 kit for further information.

Always run a trial loop and test to evaluate performance and coverage by listening to the signal with either a hearing aid or a dedicated loop test receiver. When you are happy with the quality and coverage of the loop field, the loop should be secured into position using a fixing method appropriate to the application.

Overspill and 'cross-talk'

The signal generated by the loop will radiate outside as well as inside the loop. If there are any other loop systems in close proximity, overspill such as this may lead to 'cross-talk' (signals from different loops merging into one). If this is likely to be an issue, special designs of loop can be implemented to help reduce the overspill field - contact your supplier for details.

Applications with high metal content

Large amounts of metal can affect the strength of the loop field and result in a "muffled" sound being generated. The VL1 includes a metal compensation control that can help combat such problems - see page 7 for further details.

Mounting the amplifier

The amplifier is designed to be permanently mounted using the mounting holes provided and 2 x No. 8 japanned woodscrews. Fix the amplifier securely to the chosen surface taking note of the Safety Precautions on page 2 of this manual. The stated screws will be suitable for most applications. However, always assess the condition and construction of the mounting surface prior to installation and use an alternative screw fixing if necessary.

Microphone position

Position the AMT microphone (as supplied in VL1/C, VL1/B1 and VL1/B2 kits) as close as possible to mouth height using the self-adhesive pad supplied. For optimum performance it should be located no nearer than 300mm and no further than 1.2m away from the operator's mouth. If an alternative microphone is used, it must be an 'electret' and not a 'dynamic' microphone.

INSTALLATION, SYSTEM SET-UP AND TESTING

IMPORTANT : Do not power the system up until Step 6 below. The amplifier should not be operated without a loop connected.

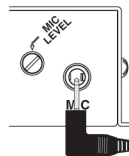
1. Install the loop (refer to the Quick Start installation datasheet supplied with your VL1 kit and the Hints & Tips on page 5). Use a multimeter to check the loop is not shorted to ground at any point. It WILL almost certainly damage the amplifier if it is.

2. Remove 6mm of the outer insulation from each end of the loop cable. Connect one end into the amplifier's left LOOP screw terminal and the other into its right terminal.

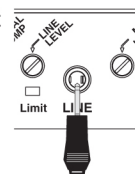
LOOP



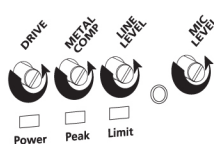
3. Plug the AMT microphone (supplied in most VL1 kits) or an alternative electret microphone into the amplifier's MIC input as shown.



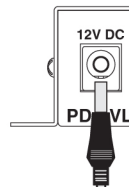
4. Plug the CD/radio line level feed (if used) into the amplifier's LINE input as shown - refer the Quick Start installation datasheet supplied with your VL1 kit for further details.



5. Ensure the amplifier's DRIVE, LINE LEVEL, MIC LEVEL and METAL COMP controls are set to minimum by turning them fully anti-clockwise.

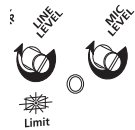


6. Connect an appropriate 12V d.c. power source (12V plugtop mains adaptor, fused cigarette lighter adaptor or a feed from a local 12V source) to the amplifier's 2.5mm 12V DC connector as shown. Ensure the amplifier's green Power indicator lights.



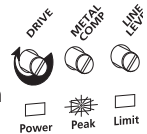
7. With the audio input source(s) active, increase the appropriate Level control(s) until the red Limit indicator is just flashing occasionally.

TIP: If you are using the microphone and line input at the same time, adjust both level controls to achieve an acceptable balance.



8. Adjust the Drive control until the red Peak indicator just lights during periods of high signal level (i.e. when the red limit indicator just lights).

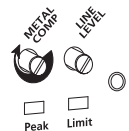
Warning: If the system is set up so the Peak indicator is permanently lit, the audio sound quality will be distorted and the amplifier may shutdown to protect it against overheating.



9. Using an induction loop test receiver, listen to the loop signal in all areas where coverage is required. If the signal level is not acceptable, adjust the Drive control in small increments until it is. Note that when testing the installation, you may hear a slight 'humming' noise in the background. This IS NOT a fault with the induction loop system but a common occurrence caused by mains wiring. This hum will normally NOT be heard by hearing aid users as most modern hearing aids have filters which cancel this noise out.



10. If a large amount of metal is present in or near the induction loop, you may find the sound you hear through the loop listening device is 'woolly' or 'dull'. This is caused by the metal in the room absorbing the magnetic field at a rate that increases with frequency, i.e. high notes are absorbed more than low notes resulting in a 'muffled' sound. If this is a problem, try turning the amplifier's METAL COMP control clockwise in small increments until a natural balance is achieved. Please note however that due to the metal absorbing power from the amplifier, its area of coverage will be reduced and further reduced as the METAL COMPENSATION control is turned clockwise.



11. For compliance with BS7594 (the code of practice for audio-frequency induction loop systems), we recommend you test the system using our PDA RANGE FPROK1 induction loop test kit. Please contact your distributor for details.

TROUBLESHOOTING

If no sound is being picked up by the hearing aid or induction loop test receiver, first check that the amplifier's green Power indicator is lit.

If the Power indicator IS NOT lit:-

Check that the power lead is correctly plugged into the mains supply and the amplifier. If the power indicator is still not lit, the power lead or the amplifier could be faulty. Check the amplifier with another power lead. If the problem persists, return the amplifier to your distributor/supplier for repair.

If the Power indicator IS lit:-

Check that the amplifier's Limit indicator is lit and that an audio signal is active. If the Limit indicator IS NOT lit, make sure all microphone and audio connection leads are correctly plugged in and at least one audio source is active.

Adjust the amplifier's Limit control until the Limit indicator just flickers.

If there is still no sound being picked up by the hearing aid or induction loop test receiver, check that the loop cable is not broken or misconnected.

Tip: The loop strength meter WILL NOT illuminate if there is a break in the loop cable or if it is misconnected.

TECHNICAL SPECIFICATION

Rated supply voltage and current: 12V DC

Rated power consumption: 500mA

Maximum RMS output current: 1A

Maximum peak output current: 2A

Maximum RMS load voltage: 4V

Total harmonic distortion: <0.5%

Max. area of a square loop, or of a rectangular loop of stated aspect ratio in m²: 25m²

Recommended loop conductor size:

0.5mm² @ <15m loop length or 1.0mm² @ >15m to <30m loop length (inc.tails)

Recommended number of turns: 1

Frequency response -1dB: 120Hz – 16kHz

Frequency response -3dB: 120Hz to 5kHz as per IEC 60118-4

Rated Input voltage: Mic: -60dB, Line: -27dB stereo unbalanced

Rated Input Impedance: Mic: 1k Ohm , Line: 100k Ohm

Signal to noise ratio, A weighted (reference maximum RMS current, maximum gain): -60dB

AGC range (3dB change in output current), reference rated input voltage: 10dB

Control and indicator labels and functions: Power LED, Limit LED, Peak LED, Mic Level

control, Line Level Control, Metal Compensation Control, Drive current control.

Special features: Compact, 12V DC Powered.

Connections: Power - 12VDC 1A, Loop Output - 2 Way Screw Terminal, Line - 3.5mm stereo jack socket, Microphone - 3.5mm mono jack socket.

Fixings: 2x No.8 Japped Woodscrew (supplied)

Dimensions (H x W x D): 31mm x 120mm x 60mm (Including controls)

Mass: 220 grams

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