



High Precision Series

LAS180

Induction Loop Amplifier

User's Manual

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1. Important safety instructions



This symbol indicates the presence of important directions for use and information that should be given particular attention so as to use the product properly.



This symbol indicates the presence of "dangerous voltage" that may cause the risk of electrical shock. Pay the utmost attention and proceed cautiously.

1. Follow carefully the attached documentation and keep it for future reference
2. Comply with the warnings
3. Store the packaging and check that all material is in excellent conditions.
4. Do not use water near the product, do not pour water or any other liquid on the amplifier. Do not to use it with wet hands or feet into the water.
5. Do not use next to heat sources such as radiators, stoves or the like.
6. Check the integrity of the mains cable. Do not tread on the cable and do not squeeze the plug.
7. Connect the plug to a socket equipped with grounding. Do not camper the plug. If the plug supplied is not consistent with your socket, please apply to an electrician for its replacement.
8. Connect to supply mains with the same voltage as indicated on the back of the amplifier.
9. Install the amplifier in compliance with the instructions.
10. Do not obstruct the air ducts.
11. Disconnect the appliance in case of storm and if unused.
12. Connect according to the instructions only.
13. Do not connect input signal higher than that indicated in the manual.
14. Do not connect the amplifier output to the input of another channel.
15. Do not connect any output of the amplifier to power sources such as battery, voltage supply or outlet, regardless of the amplifier is on or off.
16. Keep the volume controls to a minimum during the amplifier switching on/off .
17. Do not remove the upper or lower cover: there is a risk of electrical shock.
18. Do not try to self-repair the appliance, but apply to qualified personnel.
19. Clean with a dry cloth only.
20. The product shall be handled by skilled personnel in the following cases:
 - mains cable or plug damaged
 - Exposure of the product to rain or humidity
 - Some liquid entered inside the unit.
 - An object fell on the unit
 - The unit fell down and is damaged
 - The product does not work correctly or shows a remarkable change of performance.
21. A careful supervision is necessary if the product is used in the presence of children or inexperienced adults.

2. Declaration of conformity

This device conforms to the requirements of the EMC directive 89/336/EEC, amended by 92/31/EEC, and the requirements of the Low Voltage Directive 73/23/EEC, amended by 93/68/EEC.

Standards Applied:
EN55103-1 (Emissions)
EN55103-2 (Immunity)
EN60065, Class I (Safety)



3. User's liability



3.1. Dangerous output voltage

The amplifier can generate hazardous output voltage. Do not touch exposed cables of loudspeakers with the amplifier in operation.



3.2. Radio interferences

A sample of this product has been tested and approved to meet the requirements of the Electromagnetic Compatibility Directive (EMC). These requirements have been defined so as to provide reasonable protection against dangerous interference of electrical equipment. Whenever this product has not been installed or handled according to these guidelines, it might interfere with other equipment such as radio receivers. However, there is no guarantee that they should not occur in a specific installation. Should this equipment interfere with transceiver equipment (such possibility can be checked by switching on and off the device), the user should try to cancel the interference by observing one or more of the following measures:

- Increase the distance between the device and the receiver.
- Connect the device to a plug linked to a different circuit with respect to the one to which the receiver is connected.
- Redirect or move the receiver's antenna.
- Make sure that the unit concerned conforms to the EMC immunity limits (CE-labelled). All electrical equipment sold in the EC should be approved as for what concerns protection against electromagnetic fields, high tension and radio interference.
- Contact qualified personnel.

4. Introduction

Congratulations on choosing XTE device and thanks for trusting us and our products. Your device has been carefully planned in the smallest details, starting with every part of its equipment till final assemblage. All products XTE are made with the main purpose of guaranteeing our clients' full satisfaction, thus we underline that the product you have chosen uses the most advanced technology.

An improper use of the device can compromise its correct operation. Therefore we recommend you to carefully and correctly use it.

Read this manual carefully as it contains essential information for a safe use of your device.

4.1. Unpacking

Immediately inspect the package and its content so as to check whether there are any signs of damage. After unpacking check the product and all parts, if you notice any damage inform your dealer immediately.

It is advisable to save the packaging materials even if the amplifier shows no sign of shipping damage; you might have to return it to XTE or to one of its dealers. Use the original package only, which is the best way to protect the equipment from shipping mishandling.

4.2. Assembly

Metal framing of all the XTE products is suitable to be supported on a surface (table, etc.) and is equipped with separated stirrups for assembly in 19" rack standard.

Pay particular attention during the installation; we remind you that the devices should not be installed in places with:

- High temperatures
- Dust and excessive humidity
- Presence of intense magnetic fields
- Water next to the component
- Vibrations
- Closed spaces inhibiting a proper ventilation

5. Description

The newly developed LAS180 is an Induction Loop Amplifier with professional solution for mounting at Induction Loops.

The model can cover a square room with 21 x 21 meters or a rectangular room with 40 x 20 meters. It has three inputs which can all be used for microphones, or input 3 can be switched in line-level for mixing desks.

Switchable phantom power for the microphone inputs is existing.

The LAS150 has been developed to cover areas up to 800 m² and it can be connected to professional microphones and line level.

6. Features

LAS180 is equipped with a whole of features, which help, in adapting mixer to particular applications.

- MIC1 – MIC2 Microphonic input electronically balanced, connected to input sockets for a simple use.
- MIC3 Mic/Line input electronically balanced, connected to input sockets for a simple use.
- A 24 VCC potential is available at the MIC. 3 sockets, for the eventual direct “phantom” power supply
- Power on, Loop Ok and Protect Led indicators and Level meters
- Volume separated to each input and main tone (High, Low) and volume control (MASTER)
- Compression Limiter
- 12 V Loop Ok output for Info Indicator
- The unit is expected to work with 230 VCA – 50/60 Hz.
- 1 Unit design

Optional Features

- LAS180E Headphones Receiver with system info leds and arranged for the 3,5 mm jack headphones-connection.

7. Applications



What is an induction Loop

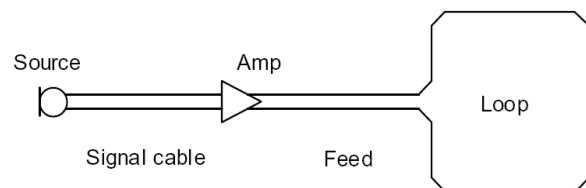
The induction loop technology is based on electromagnetic transmission and has the unique advantage that the signal is received directly by the user's hearing aid when equipped with a T-coil (tele-magnetic pickup coil).

A basic induction loop system consists of an amplifier and a loop (a single stranded hookup wire) that runs along the perimeter of the room. When the loop amplifier is fed a signal from a microphone or the house PA system, the sound is received wireless by the user's hearing aid without the need for an additional receiver as is required by all other technologies.

Therefore, the induction loop technology is the most popular method for T-coil users of providing assisted listening accommodations in stand alone public facilities.

It is for this reason that more attention is now being given to assisting hearing-aid users by installing induction loops in churches, public buildings and in some cases, the workplace.

Below is a simple diagram of a loop system, loop layout may often be more complicated depending on the environment.



8. Front Panel: Controls and Indicators



All regulating controls of the LAS180 are adjustable by screw driver to avoid unauthorized misplace. Each input has an own Mixing control in front of the compressor limiter. The compression level (reduced gain) is indicated on a bar graph with 4 LED´s (0 to 18 dB), to allow the user to choose the best volume range for the application. The master control sets up the output maximum current that is indicated on the current bar graph with 5 LED´s (2 – 10 A). The model indicates power, loop OK and the protection status (PROTECT/LOOP OK/POWER) of the output level on the front panel. The „Loop OK“-lamp only luminescents, when the sound runs through the loop and truly indicates, that the loop is working. The model is suitable as table version and also for 19“-installations.

9. Back Panel: Controls and Connectors



The three audio inputs of the LAS180 are equipped with standard XLR jacks. The inputs 1 and 2 are microphone level controlled, input 3 is selectable by using the blue push button on the rear side between mic.- and line-level. Phantom can be activated at all microphone inputs by using the second blue push button on the rear side. An 0 dB-output for cascade connection of the amplifier and INSERT-jack for additional looping-devices are available. The Loop Ok output is a 12 V-output to drive the INFO-indicator, when the loop is working. The loop connections make it possible to connect the amplifier with an up to 2,5 mm -cable (we recommend to use a clamp at the cables´ ends), to close the loop

10. Power Supply

The unit is expected to work with 230 VCA – 50/60 Hz distribution system.

In case of power dysfunction, check the outside protection fuses and eventually replace them with others of same calibration; if one of them burns out immediately, do not go on and have check the unit by qualified personnel.

Take away plug from 230 VCA electric power socket always, before removing fuses and, in any case, open the unit framing.

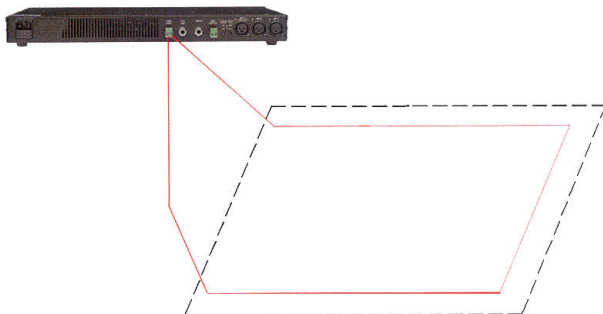
11. Installation Instructions

11.1. Planning a Loop System

Most of the problems with this amplifier occur, when the installation hasn't been correctly thought through, therefore take some time at the beginning to save a lot of time after.

11.2. Dimensioning the Loop System

LAS180 can cover a square room with 21 x 21 meters (450m²) or a rectangular room with 40 x 20 meters (800m²).



The induction loop is routed around the perimeter of the interested area, with the cable under the floor, in the ceiling, under the carpet etc.

A loop cable is classed as a 2A cable under IEEE 16th Edition wiring regulations.

As such it must be sited a minimum of 600mm away from telephone, mains and control cables.

Almost any stranded or solid single core cable can be used for the loop, provided it is not liable to break and is of the appropriate size.

The loop impedance is about equal to the DC resistance.

The cross-section should be chosen so the loop is as near to 0,5 ohm as possible (0.1 to 1 ohm) and robust insulation is recommended to minimise the chance of shorting the cable to earth.

If the impedance is less than 0.1 ohm or greater than 1 ohm there may be degradation of signal.

To obtain the correct impedance, there follows a wire impedance chart and example calculation.

Wire impedance table

Cable Diameter mm ²	Impedance per meter Ohm
0,5	0,33
0,75	0,022
1,5	0,011
2,5	0,0067

Example Calculation

Loop impedance =
Length of loop x impedance of cable per meter.

LAS180 can cover a square room with 21 x 21 meters (450m²).

Cable Length = 84 meters

84x0,0067= 0,56Ohm

For this example, 2.5mm² cable would be the preferred option as its DC impedance is nearest to the recommended level of 0,5 Ohm.

11.3. Induction Loop Design

If a building has a high metal content, the sound coverage may be erratic.

When installing a loop system care should be taken not to install it over large metal objects, such as heaters or around metal baseboard moldings.

The metal acts as a shield and weakens the signal.

PVC pipe must be use to laied the loop under the floor, steel pipe cannot be use!

11.4. Installing the Loop System

The installation is very easy, the model should be put in a suitable place, ideally as close as possible to the area which shall be covered.

The loop cable (a simple 2,5 mm turn loop cable) connected to a 2-way plug at the amplifier's rear side.

Make sure that the microphone(s) are placed near the area where the sound is picked up.

The master-control and input control can now be adjusted, so that the gain reduction-LIMITER measures 12 dB at loud speech (microphone).

It is a good practice to supply to all installations a loop listening device.

This makes it possible to the responsible person to test the loop periodically and to record the correct working in a logbook.

Should a listening device not be available, adjust the master-control in a way that the red OUTPUT-LED only flashes at the maximum value.

Don't let the model work with constant red LED!

Please Note:

All of the above are guidelines only; we always recommend a test loop should be laid as there is no such thing as a basic installation.

Each job will be unique and will have its own problems or criteria (for example metalwork, reinforced concrete, false ceilings etc.)

11.8. Possible problems with an induction loop system

Some hearing aid users find that they have to turn up the volume on their hearing aid a little when they switch to 'T' but this should not be a problem if the loop has been set up properly.

However, even if the loop system works correctly, you might pick up buzzing noises when you set your hearing aid to 'T', or when using a loop listener.

This is caused by interference from electrical equipment such as fluorescent lights, dimmer switches or electric cables.

Although loop systems are generally designed for use within the area of the loop, the loop signal can spill out into other rooms.

Walls, ceilings and floors do not block the magnetic waves from a loop.

Hearing aid users whose hearing aids are also switched to 'T' and people using a loop listener outside the room may be able to overhear sound or conversations.

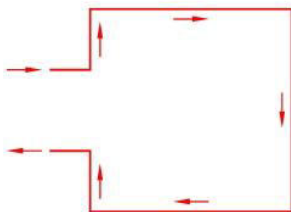
Rooms that are next to each other, and rooms directly above and below the loop, can be affected.

This could be a problem, for example, if a next-door neighbour also uses a loop system, or if you need to have a confidential conversation.

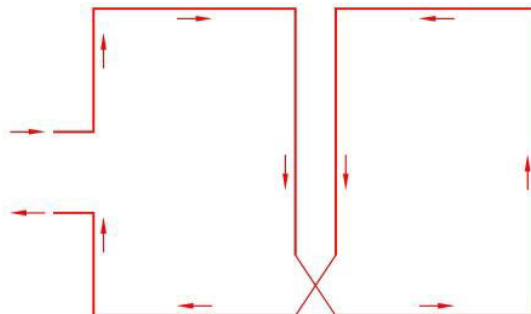
You could try to reduce the size of the loop in order to get round this problem - you might need to re-arrange the seating.

12. Configuration Example

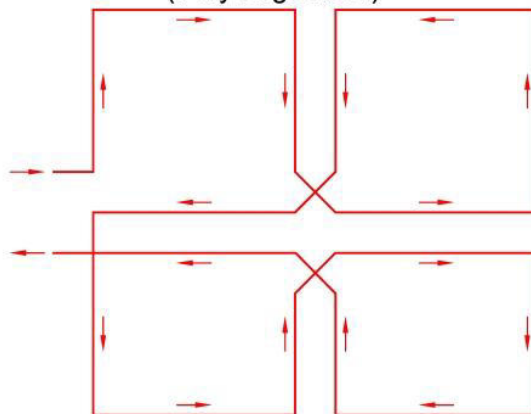
Simple Induction Loop System
(Up to 20mx20m)



Double Induction Loop System
(Over to 20mx20m)



Multiple Induction Loop System
(Very large Area)



13. Technical Specifications

MODEL	LAS180
Compressor / Limiter:	For limiting 20:1 with 10 ms access time
Dynamics:	> 60 dB
Harmonic distortion:	< 0.3 %
Loop impedance	0.1 - 1 Ω
Maximum current:	> 15 A
Root mean square current (at 1 kHz):	> 10 A
Input sensitivity:	- 50 dB MIC. / 0 dB LINE
Front Indicators	Limiter 4 x LED`s, output 5 x LED`s, protect, LOOP-OK, power
Audio inputs / outputs:	MIC.1, 2 , Line/Mic.3 balanced XLR, INSERT, 0 dB output
Phantom power:	switchable 12 V
Info LOOP OK (output):	12 V / DC
Protection circuits:	Current-limiting (short circuit), against too high temperature, soft-start
Consumption (max power)	300 VA
Power Requirements	230 VAC - 50/60 Hz
Dimensions (WxHxD)	440 x 44 x 200 mm
Weight – Net	6,5Kg

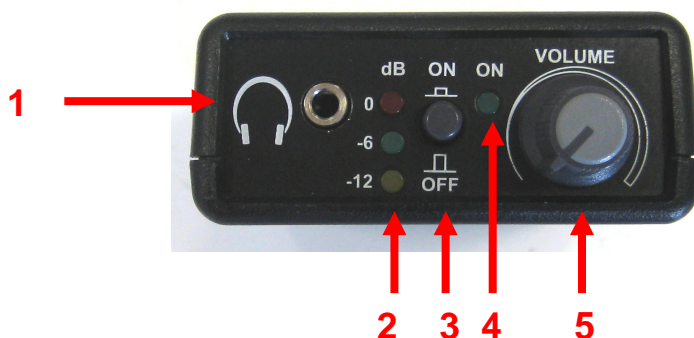
Headphones Receiver

LAS180E with LED sensitivity display, CUT- Filter and mono headphone



14. Description

With the induction loop receiver LAS180E, a loop system can be checked and maintained easily, fast and uncomplicated. The device is especially suitable for responsible staff wherever the induction transmission is installed, or for people who need a high quality “wireless” hearing device without hearing aid. The LAS180E receiver is a very compact, handy and versatile device, it is used as sheer audio receiver for people, whose hearing device has no “T-position”, or for supervision resp. control of the field strength and quality of the transmission of the induction loop system.



1 - CONNECTION BUSH FOR HEADSET

Headset connection bush to mini-jak with a gain of max. 100mW@16 Ohm

2 - LED FIELD STRENGTH RECEPTION INDICATOR

The green LED indicates a reception in the range 50 mV/m
 The yellow LED indicates a reception in the range 100 mV/m
 The red LED indicates a reception in the range 400 mV/m

3 - CUT - FILTER

Switch position to: (ON) input low-cut-filter (400Hz) to remove low frequencies and interferences, phase shift is activated.
 Switch position to: (OFF) the highpass-filter (low-cut-filter, 400Hz) is deactivated.

4 - OPERATION DISPLAY POWER ON

The green LED display n. 5 lights when the receiver is switched on and ready for use.

5 - VOLUME CONTROL WITH POWER ON/OFF-POSITION

With this control the volume of the headset can be adjusted, also by turning the VOLUME-control the receiver is switched on and off. ON/OFF position.

The LAS180E induction loop receiver has a measuring system with an optical LED-indicator of the field strength, the indication range is between green LED-display 50 mA/m/RMS, yellow LED-display 100 mA/m/RMS, red LED-display 400 mA/m/RMS.

Besides this, in the upper area of the receiver there is a connector panel to connect a headset with volume control and CUT-filter 400Hz.

15. Technical Specifications

Model	LAS180E
Operating time:	100 hours
Battery	2 x 1.5 V type; AA or rechargeable batteries
Headset	200 Ω, 3,5 mm mini jack-plug
Display / measurement Led	GREEN: 50mW, YELLOW: 100Mw, RED: 400Mw (M/RMS)
Dimensions (WxHxD)	67 x 90 x 25 mm
Material	Plastic
Colour	black
Weight	100 g (without batteries)
Frequency response without CUT-filter:	85 Hz to 6kHz, +/- 0,5dB
Frequency response with CUT-filter:	400 Hz to 6kHz, +/- 3dB
Headset output:	100 mW@200 Ohm
THD:	< 0,5% @ 1 kHz