

Connevens AFILS Loop Field Strength Meter – User Instructions

The Connevens 40IFSCE Audio Frequency Induction Loop field strength meter is a calibrated precision measurement device. It is designed to meet the requirements of BS7594.



Two different frequency response characteristics are provided: 'NORMAL' which is a restricted response, similar to that of a hearing aid, and 'FLAT' which is a wide, flat response, similar to that of an equalized induction loop receiver for wide-band communication. Both filter characteristics meet the requirements of BS7594.

The meter is calibrated in two ranges; +3dB to -24dB and -24 to -51dB with respect to the field strength of 0.56A/m recommended by BS7594, allowing background magnetic noise levels to be measured as well as AFILS signal strengths. The measured audio signal may be monitored using headphones on all range and filter combinations.

Safety, Care and Maintenance

Keep the unit away from heat sources such as radiators, heaters or other appliances that produce heat.

Do not expose the unit to direct sunlight.

Do not use the unit near water.

Avoid objects or liquids getting into or onto the unit.

Clean only with a damp cloth. Do not use abrasive cleaners.

Do not remove screws from or open the unit casing. This will invalidate the calibration and any warranty.

Damage to hearing can occur with consistent exposure to high volume when using headphones. Always check the volume level before using headphones.

Calibration

This unit is calibrated at manufacture to meet BS7594. If measurement accuracy is critical, the instrument should be re-calibrated annually.

Have the calibration re-checked if the instrument is dropped or otherwise damaged.

A three point calibration at 0dB, -24 & -27dB is standard at the time of manufacture. A full 20 point calibration service (part no. 40IFSCAL) is available.

Batteries

Press and slide the battery cover to remove.

Orientate the battery as shown in the battery compartment moulding. No harm will occur if the battery is reversed but the instrument will not work.

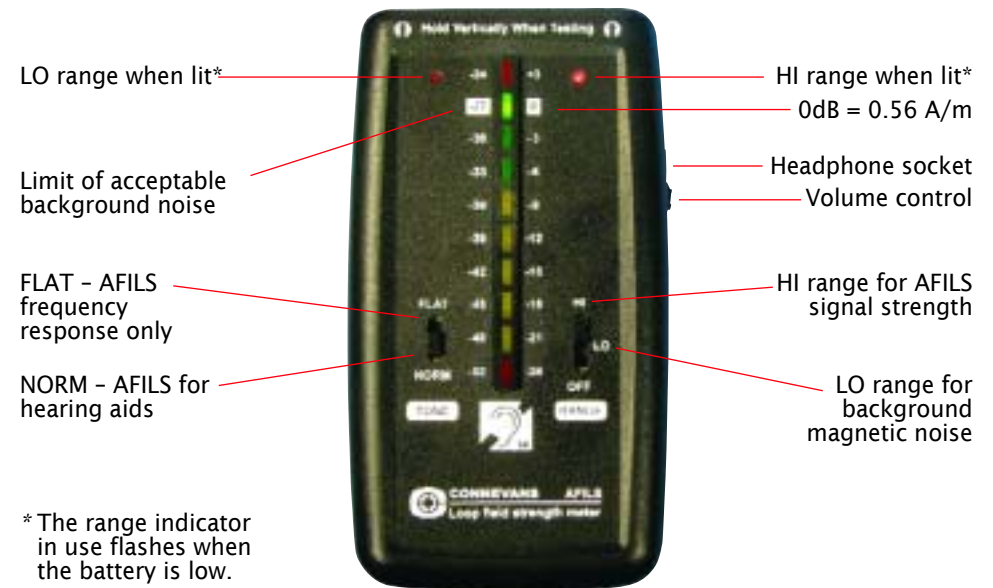
Rechargeable batteries are not recommended for infrequently used equipment due to self discharge, but they can be used in this equipment. Operating life will be shorter from a rechargeable battery than from an alkaline battery.

Replace the battery as soon as convenient after the red range indicator(s) start to flash.

Switch off when not in use to prolong the working life of the battery.

Remove battery if not required for an extended period of time and remove an exhausted battery as soon as possible to prevent leakage.

Dispose of the old battery according to local regulations.



Background information

There are a number of important features on this meter that distinguish it from other similar meters on the market:

- 1 The indicating scale is referenced to a magnetic field strength of 0.56A/m, as recommended in BS7594. The long term average field strength required from an AFILS in the UK is 0.1A/m rms. However, speech has a peak to mean ratio (or crest factor) of 12 to 15dB so to maintain good speech intelligibility, a correctly set up AFILS must deliver a peak rms field strength 12 to 15dB (4 to 5.6 times) higher than 0.1A/m. Note that it is not sufficient to simply set up a loop system to deliver a field strength of 0.1A/m using a constant amplitude source such as a tone or pink noise because these sources do not give a representative speech-like power spectrum with a realistic peak to mean ratio. If the loop amplifier uses compression, then it may be possible to produce a constant field of 0.1A/m but that does not mean that the amplifier can provide sufficient current to deal with the speech peaks. Conversely, a loop amplifier that can provide a constant field of 0.56A/m may be overspecified and potentially unnecessarily costly for the application.

- 2 The meter responds to programme peaks. This PPM style of indicator was developed by broadcasters to control the peak levels of audio signals and so prevent overmodulation of the transmitters. The PPM meter allows the user to verify in real time that an AFILS can provide sufficient field strength for good speech clarity.
- 3 The monitor audio output is active on all range and filter combinations. The monitor output frequency response is modified to emulate that of a typical induction loop listener. This means that the person testing hears a similar signal to that to be heard by a loop user.
- 4 This meter is operated in the vertical plane so that it is easy to read when held at the hearing aid position. All AFILS field strength meters measure the correct field strength in one physical plane only. A classic problem with other meters designed to respond horizontally is that they may not be read easily when held at the listening position of the hearing aid (e.g. standing height at a ticket counter).
- 5 This meter is designed with high quality components for low noise and operates over a very wide range of 54dB in two stages. The range in use is indicated by an LED as is a low battery condition warning.
- 6 The LED scale is colour coded. Green is OK for background noise and speech peaks (depending on range selected).
- 7 Two measurement filter (tone) responses are provided. The FLAT setting is provided only for measuring system frequency response in conjunction with an external signal generator. For all other measurements the NORMAL setting is used.
- 8 The meter is calibrated, traceable to National Standards. Annual checking of calibration is advised.

Instructions for use

Checking the background noise level

NOTE: Do not use the monitor headphones on higher than volume 4 for this test (i.e on LO range setting) in order to maintain accuracy and stability in the instrument.



Switch off any audio induction loop equipment (but switch on any other mains operated equipment in the test area that would normally be in use)

Set the TONE (filter) switch to the NORM position

Move the RANGE switch to the LO position

Hold the meter upright with the top at the position a hearing aid is likely to be used.

Observe the LED bargraph. The background noise level should be no more than -27dB (i.e. green or below).

If the red -24dB LED shows, then the background noise level is too high for a loop system to be used successfully at this particular location. It is unusual for the reading to be very low (below -52dB) in a building with mains power but for confidence, the meter operation may be checked by temporarily selecting the FLAT tone setting.

It is not uncommon for certain areas within the area of a loop system to suffer poor background noise or signal strength, due to the construction and layout of electrical services in a building. If the majority of the area covered by the loop gives satisfactory signal to noise ratio then the poor areas may be marked as not suitable for hearing aid users as described in section 1.4.4 of BS7594:1993.

Checking or setting the induction loop drive current

Switch the induction loop equipment on.

Set the drive control on the loop amplifier to $\frac{3}{4}$ or follow the manufacturer's instructions.

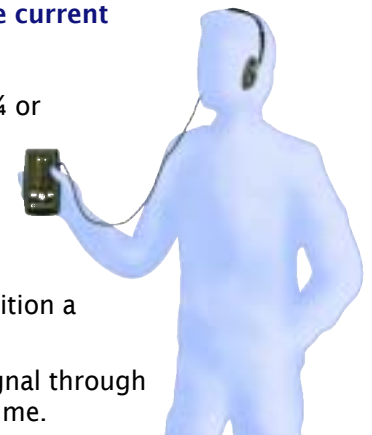
Set the TONE (filter) switch to the NORM position

Move the RANGE switch to the HI position

Hold the meter upright with the top at the position a hearing aid is likely to be used

Observe the LED bargraph and listen to the signal through the monitor headphones at a comfortable volume.

NOTE: This step is of critical importance to the correct setting up of the AFILS system. Whilst an assistant speaks in a realistic voice appropriate to the venue and at a realistic distance from the system microphone, adjust any mixer or microphone gain controls so that the bargraph peaks into the green, ideally to 0dB on speech peaks. If 0dB cannot be achieved, increase the drive control and try again.



Apply a representative source to any auxiliary input and set the corresponding volume controls to a position where the meter bargraph also peaks into the green, ideally to 0dB, as before.

Check that the audio quality is acceptable through the monitor headphones.

Rechecking the background noise with the AFILS system on

Ideally, the background noise should be re-checked with the AFILS switched on in case there is any significant hum or other source of undesirable noise associated with the AFILS itself. If this is the case then the cause of such noise must be found and eliminated or minimised to an acceptable level no more than 27dB below the speech peaks. The person testing the system should listen through the monitor headphones whilst observing the meter bargraph (but do not exceed volume 4 on the LO range setting).

Set the TONE (filter) switch to the NORM position

Move the RANGE switch to the LO position

Hold the meter upright with the top at the position a hearing aid is likely to be used.

If the background noise level is low (i.e. less than -36dB) and the loop system struggles to produce 0dB, then a lower maximum level of -3dB is acceptable on speech peaks.

Checking the AFILS frequency response

Switch the induction loop equipment on.

If not already done, set the drive control on the loop amplifier to $\frac{3}{4}$ or follow the manufacturer's instructions.

Set the TONE (filter) switch to the FLAT position

Move the RANGE switch to the HI position

Hold the meter upright with the top at the position a hearing aid is likely to be used

Observe the LED bargraph.

Using a sinusoidal tone generator, apply a 1kHz tone to one of the amplifier or mixer inputs and adjust the volume and/or gain control(s) so that the -6dB and -3dB LED's on the bargraph are both lit equally.

Maintaining all volume and gain controls at these settings, reduce the frequency of the test source until the -9dB and -6dB LED's on the bargraph are both lit equally. Note this frequency as the lower 3dB limit (typically around 100Hz).

Now increase the frequency of the test source to a frequency higher than 1kHz until the 9dB and -6dB LED's on the bargraph are again both lit equally. Note this frequency as the upper 3dB limit (typically around 5kHz).

Specifications

Power:	1 x PP3 9V alkaline
Current drain:	20-50mA
Battery life:	>10 hours
Indicating ranges:	-51dB to -24dB and -24dB to +3dB with respect to 0.56A/m
Indicator style:	BBC/EBU Peak Programme Meter (3ms attack, 650ms decay)
Resolution:	3dB
Absolute accuracy: reducing to	± 0.5 dB @ 0dB (0.56A/m) and -27dB (25mA/m) ± 1.5 dB @ -24dB (35mA/m) and -51dB (1.6mA/m)
Filter characteristics:	NORM: -3dB @ 630Hz & 5kHz FLAT: -3dB @ 40Hz & 14kHz
Headphone monitor:	max 2 x 19mW into 32 ohms
Relevant Standards:	BS7594, BS6083, BS6840, BS EN 60118



At the end of their useful life, the packaging, product and batteries should be disposed of via a suitable recycling centre. Do not dispose of with your normal household waste. Do not burn.

This product is RoHS compliant.



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