

## Important notes

- All FoSmeter variants contain a magnetic field sensing element that is direction sensitive. When held vertically in the centre of horizontal loops the sensor is at its most receptive. Try rotating the FoSmeter into the horizontal plane and see the relative reading fall. In virtually all instances, the FoSmeter should be held vertically.
- Large amounts of electrical noise may interfere with the AFILS signal. To test for this, move the 'A' weighting switch to 'Normal' and the GAIN sensitivity switch to 'High'/'Low' as appropriate and read off the level of background noise interference. Fluorescent lights are a common source of high levels of interference. Please note, the 'High' GAIN sensitivity setting is not available on the FoSmeter-H combined FoSmeter / Loop Listener.
- Some buildings may contain large amounts of metal which will affect the loop strength. Please check for this and make allowances where necessary - the client should always be advised of any variances to the standard.
- If special loop patterns are used, e.g. herringbone, then the lowest field strength reading may not be in the centre of the loop. However, large variations in loop field strength are unlikely. An adequate field strength can be confirmed by random testing within the covered area.
- With very small loops, e.g. pre-formed counter loops, etc, the field strength will vary rapidly as the distance from the plane of the loop is increased.
- For larger applications, it may not be convenient or practical to have a long lead trailing from the centre of the covered area to the actual AFILS amplifier. For these situations, a separate P-NGen pink noise generator (PNGN) and FoSmeter (AHHM) should be used. We recommend that the FoSmeter+ combined magnetic field strength meter and pink noise generator (AMPN) are only used for testing smaller installations, i.e. rooms up to 50m<sup>2</sup>.
- There is a requirement within the AFILS standard to accommodate short term input signals that are 12dB above the rms average value due to the irregular nature of audio signals. Thus all PDA RANGE loop amplifiers contain a variable ratio compressor which automatically compresses this audio dynamic range. Since this range is variable from 1:1 to in excess of 5:1, it is difficult to predict the exact instantaneous peak reading that should be obtainable on the FoSmeter. However, all PDA RANGE AFILS amplifiers are capable of supplying instantaneous short term peak currents of >2 times the rms value which more than accommodates the 12dB input signal overload requirement even with a modest 2:1 compression ratio.
- The following connection leads are available from your distributor for connecting the pink noise generator on the P-NGen or FoSmeter+ to a PDA RANGE induction loop system:-
  - AL1 3.5mm jack to 3.5mm jack lead
  - AL2 3.5mm jack to double phono lead
  - AL3 3.5mm jack to pre-cut end lead

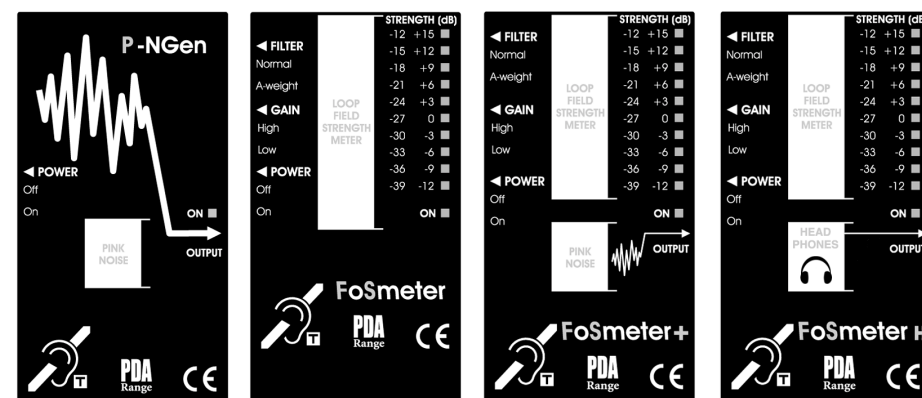
If you wish to make your own connection lead(s), please note that Tip = Audio+; Ring = Audio- and Screen = Internal ground.
- The FoSmeter H combined FoSmeter/Loop Listener can be used with most 3.5mm 'Walkman' style headphones provided they have an impedance level of at least 32 Ohms. DO NOT plug headphones into any other unit in the FoSmeter / P-NGen range.

# FoSmeter/P-NGen

**FoSmeter : Magnetic Field Strength Meter**

**P-NGen : Pink Noise Generator; and variants**

*Please read ALL of these instructions carefully before operating this equipment*



**P-NGen**  
Pink Noise Generator  
(part no PNGN)

**FoSmeter**  
Magnetic field  
strength meter  
(part no AHHM)

**FoSmeter+**  
Combined magnetic  
field strength meter &  
pink noise generator  
(part no AMPN)

**FoSmeter H**  
Combined magnetic  
field strength meter &  
loop listener  
(part no AHHM/H)

This equipment allows you to accurately set up and maintain audio frequency induction loop systems (AFILS) for compliance with industry accepted standards. The range consists of the **P-NGen** Pink Noise Generator and the **FoSmeter** Magnetic Field Strength Meter. Used together, they represent the most reliable method of ensuring that an AFILS system is working correctly. A combined Pink Noise Generator and Magnetic Field Strength Meter, the **FoSmeter+**, is also available for use on smaller systems and the range is completed by the **FoSmeter H** which is a combined loop strength meter and loop listening device.

*These instructions relate only to the **P-NGen**, **FoSmeter**, **FoSmeter+** and **FoSmeter H** when used to test a PDA range induction loop system. Note that we do not warrant the correct operation and calibration of this range of equipment with other manufacturers' loop amplifiers.*



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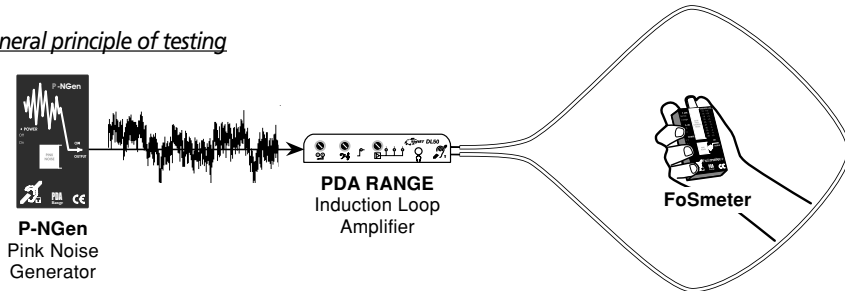
## Introduction

Induction loop systems require careful testing and calibration prior to operation. The most efficient way of doing this is to use a Pink Noise Generator and a Magnetic Field Strength Meter.

BS7594 recommends that the minimum magnetic field strength of an AFILS system over a covered area should be 100mA RMS per metre. The most efficient way of ensuring this requirement is met is to measure the magnetic field strength of a steady output from the AFILS amplifier.

Unlike music or speech (both of which provide a variable sound output from which it is virtually impossible to obtain an accurate RMS reading), pink noise has an equal and constant amount of energy content per octave of bandwidth. When fed into an AFILS system, pink noise therefore gives a constant magnetic field strength which can be easily and accurately measured using a magnetic field strength meter.

### General principle of testing



Except for a very small distance directly underneath or above the loop wiring, the minimum field strength in straightforward loops will invariably be in the centre of the loop. By adjusting the AFILS amplifier so that a reading of 0dB is obtained on the FoSmeter in the centre of the loop (0dB being 100mA/m), the installer can ascertain the field strength for the entire installation by referring to the 10 LEDs on the FoSmeter's front. BS7594 states that a reading of between +6 and -6 dB should be obtained throughout the 'area of coverage' (as defined by the installer) with any areas of unavoidable poor coverage, i.e. large steel objects, metal filing cabinets, etc, clearly identified to the client.

## Equipment overview

**P-NGen Pink Noise Generator:** The **P-NGen** pink noise generator can be connected to the line level input of most audio-frequency induction loop amplifiers. It has a fixed level output of approx. 400mV RMS and a crest factor of approximately 4:1. See page 4 for connection lead details.

**FoSmeter Magnetic Field Strength Meter:** The **FoSmeter** accurately measures the magnetic field strength of an induction loop system. It is calibrated at manufacture for accuracy and linearity using a calibrated magnetic field and includes 10 LEDs. These are set out in 3dB increments to indicate magnetic field strength relative to 100mA/m (indicated as 0dB). The FoSmeter also features GAIN and FILTER sensitivity switches, more detailed explanations of which can be found on page 3.

**FoSmeter+ Combined Magnetic Field Strength Meter & Pink Noise Generator:** Combines the functions and features of the FoSmeter and the P-NGen in one unit.

**FoSmeter H Combined Magnetic Field Strength Meter & Loop Listener:** Combines the functions of a FoSmeter and loop listening device in one unit. Includes a 3.5mm jack socket which allows conventional audio signals (such as music and/or speech) to be assessed using Walkman-style headphones (not supplied). When being used as a loop listening device, the FoSmeter H's GAIN switch must be set to the low position to allow you to listen to the system as a hearing aid user would and prevent interference from mains hum, etc.

All **FoSmeter** and **P-NGen** variants require a 9V PP3 alkaline battery (not supplied).

## Operation

1. Switch on the **P-NGen** (or **FoSmeter+**) and, using an appropriate lead, connect its pink noise output to a suitable line level input at the AFILS amplifier. All PDA amplifiers have such an input and connection leads are available from your PDA range distributor.
2. Adjust the input signal control on the amplifier until its input signal/loop compressor indicator begins to illuminate. Next, adjust the amplifier's loop current drive control to its mid setting (you can check this by referring to the amplifier's loop strength meter - usually indicated by at least 3 LEDs - and ensuring that the middle LED is lit).
3. Ensure the **FoSmeter** slide switches are set to 'A' weight & 'Low' sensitivity (see diagram below)
4. Stand in the centre of the covered area and hold the FoSmeter vertically at the height you wish measurements to be taken (typically the height that a hearing aid would be worn by either a standing or sitting person).
5. Whilst still in the centre of the covered area, read off the field strength in dB relative to 0dB (0dB indicates the required field strength of 100mA/m). Adjust the loop drive current control on the AFILS amplifier either upwards or downwards until it indicates 0dB on the FoSmeter. The field strength at this point is 100mA/m.
6. Carry out further checks at random within the area covered to confirm that the field strength is sufficient. As a general rule, the reading should be between +6 & -6 dB in the area of coverage.

If using a **FoSmeter-H**, disconnect the pink noise generator from the AFILS amplifier and connect a conventional audio source (such as a microphone or background music source), and assess the audio quality using Walkman-style headphones connected to the FoSmeter-H's 3.5mm jack socket.

**BE SURE TO READ THE IMPORTANT NOTES SECTION ON PAGE 4 BEFORE APPROVING THE INSTALLATION**

## Controls

### FILTER sensitivity switch

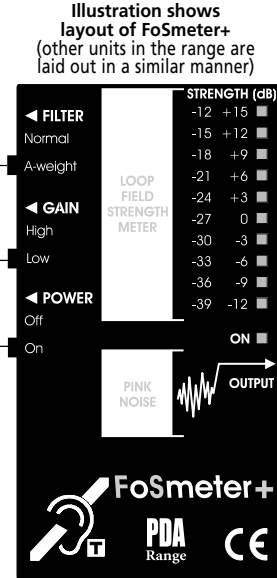
In the 'A' weight position the sensitivity of the FoSmeter is reduced for lower and higher frequencies and follows roughly the response of the human ear. This greatly reduces the influence of mains pickup compared to the Normal position which has a flat frequency response. We recommend the FoSmeter is always used in the 'A' weight position when compliance measurements are being taken.

### GAIN sensitivity switch

The Low sensitivity setting corresponds to readings on the FoSmeter's right hand strength scale, labelled +15 to -12dB. This setting should always be used (with the FILTER switch also in the 'A' weight position) when compliance measurements are being taken. The High setting corresponds to the left hand scale, labelled -12 to -39dB.

Please note, on the FoSmeter H, the GAIN switch is set to operate in low mode only to prevent interference when listening to the loop signal via its 3.5mm jack socket.

### POWER on/off switch



### Magnetic field strength indicators

These 10 LEDs indicate the magnetic field strength relative to 100mA/m (i.e. 0dB). One LED is coloured green and indicated as 0dB. The other nine LEDs are yellow and increase or decrease in 3dB increments from the previous one giving a range of +15dB to -12dB on the right hand scale (low sensitivity) and -12dB to -39dB on the left hand scale (high sensitivity). The response of the indicators is fast attack and slow decay in line with Peak Programme Meter type instruments to IEC 118.

Depending on the unit purchased, if provided this 3.5mm jack output will have one of the following functions.

**Pink noise output (P-NGen / Fosmeter+)** Carries balanced pink noise @ approx 400mV RMS with a 4:1 crest factor. The output is compatible with all PDA loop amplifiers and a selection of connection leads are available (see page 4).

**Loop listening output (FoSmeter-H only)** Can be used to assess the quality of conventional audio signals being broadcast through the loop using Walkman-style headphones.