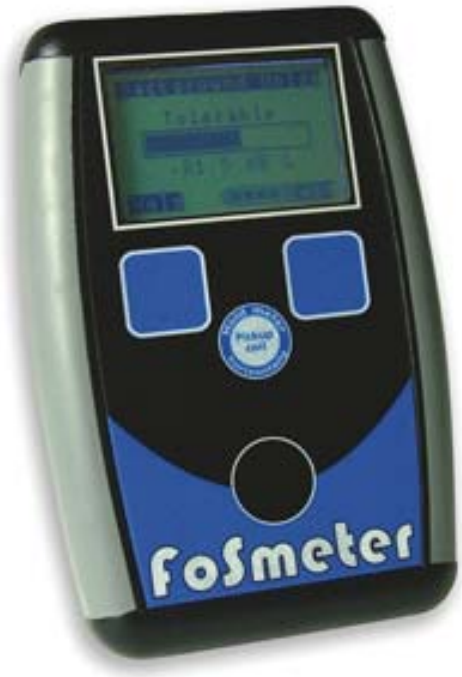
CHANNEL

SAFETY SYSTEMS

FoSmeter



Induction loop systems
from Channel Safety Systems

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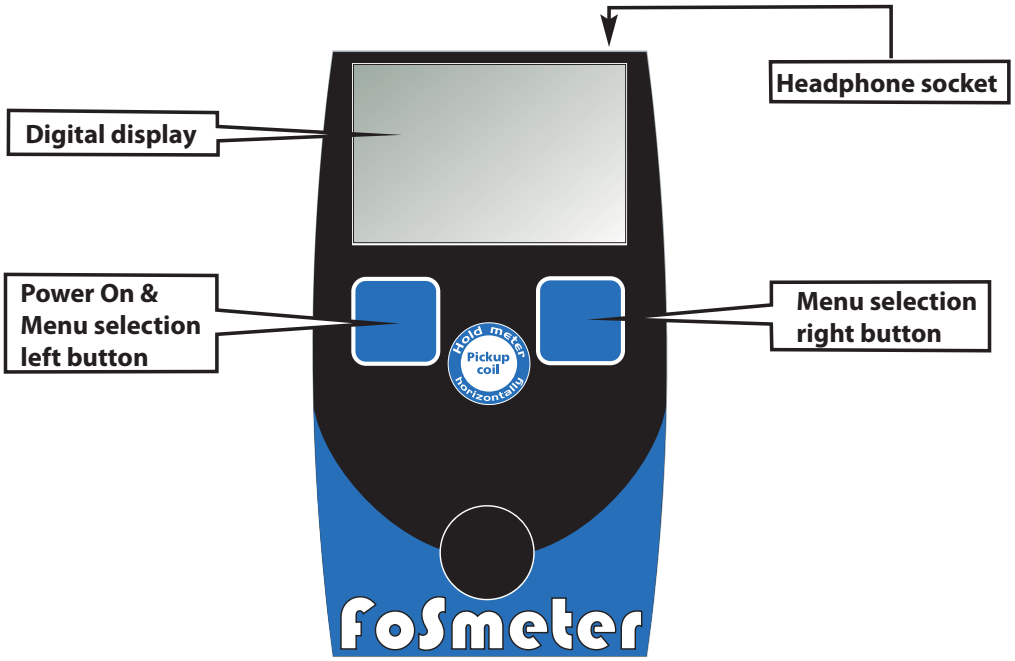
FOSMETER PRO (FPRO) INSTRUCTIONS

400 mA MAGNETIC FIELD STRENGTH METER & LOOP LISTENER

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



ITEMS SUPPLIED

1 x Fosmeter Pro (FPRO)
1 x Protective pouch for the FPRO
1 x MP3 player (pre-loaded with test tones)
1 x HEAD1 Headphones (32 ohm)
1 x 9 V battery
1 x User Instruction (Doc. No. DCM0004006)
1 x FPRO Calibration Certificate (Doc. No. DCM0004007)
1 x AFILS Test Certificate (Doc. No. DCM0004008)

IMPORTANT NOTE

These instructions relate to the 400 mA Fosmeter Pro (FPRO) when used to test an audio frequency induction loop system (AFILS) in accordance with BS EN 60118-4 (Magnetic field strength in audio frequency induction loop systems).

INTRODUCTION TO TESTING INDUCTION LOOPS

PRODUCT DESCRIPTION

The FPRO aids the set up and maintenance of AFILS for compliance with BS EN 60118-4.
It has the following features:

- A 400 mA fosmeter; combined magnetic field strength meter and loop listener.
- Measures magnetic field strength, background noise, frequency response, metal compensation plus speech and music tracks.
- A graphical LCD display; provides a user-friendly interface to simplify. Contrast control and battery life indication are also provided.
- Two 'soft' buttons; dynamically change their functions to suit the menu options being accessed.
- Auto power off feature; the fosmeter will warn the user after 10 minutes of inactivity, then give the user 30 seconds to shutdown the meter, or postpone the event.
- 3.5 mm headphone jack socket; allows audible monitoring using HEAD1 (supplied).
- An MP3 player (supplied) pre-loaded with test tones (1 kHz sine wave, frequency response and metal compensation), plus speech and music tracks to assist with subjective testing.
- Powered by a 9V PP3 battery (supplied).

INTRODUCTION TO TESTING INDUCTION LOOPS

Induction loop systems require careful testing and calibration prior to operation. The most efficient way of doing this is to use the FPRO. The current standard BS EN 60118-4 recommends that the achievable magnetic field strength of an AFILS over a 'covered area' should be 400 mA RMS per metre. The most efficient way of ensuring this requirement is met is to measure the magnetic field strength of a consistent output from an AFILS amplifier using the FPRO.

SPECIFICATION			
Internal Battery	1 x 9 V PP3 battery (non-rechargeable)		
Quiescent Current	25 mA		
Battery Life	12 hours approx.		
FPRO Test	**Calibration**	**Measurement Scale**	**Frequency**
Field Strength	400 mA/m (0 dB L) as per BS EN 60118-4	<-22 to >+8 dB L	1 kHz detection
Frequency Response	400 mA/m (0 dB L) as per BS EN 60118-4	<-22 to >+8 dB L	100 Hz / 1 kHz / 5 kHz detection
Background Noise	+/-1 dB L	<-42 to >-22 dB L	A-weighted detection
Metal Compensation			3rd octave band 1 kHz to 8 kHz
Headphone Socket	3.5 mm jack socket headphones (HEAD1)		
Digital Display	LCD type (viewing area 50 mm diag.)		
Weight	145 g approx. (plastic enclosure)		
Overall Dimensions	117 mm x 79 mm x 18.5 mm		
IP Rating	IP20		
Note: The FPRO contains sensitive electronic equipment. It is designed for indoor use only and MUST NOT be subjected to conditions likely to affect its performance.			

METAL COMPENSATION MEASUREMENT

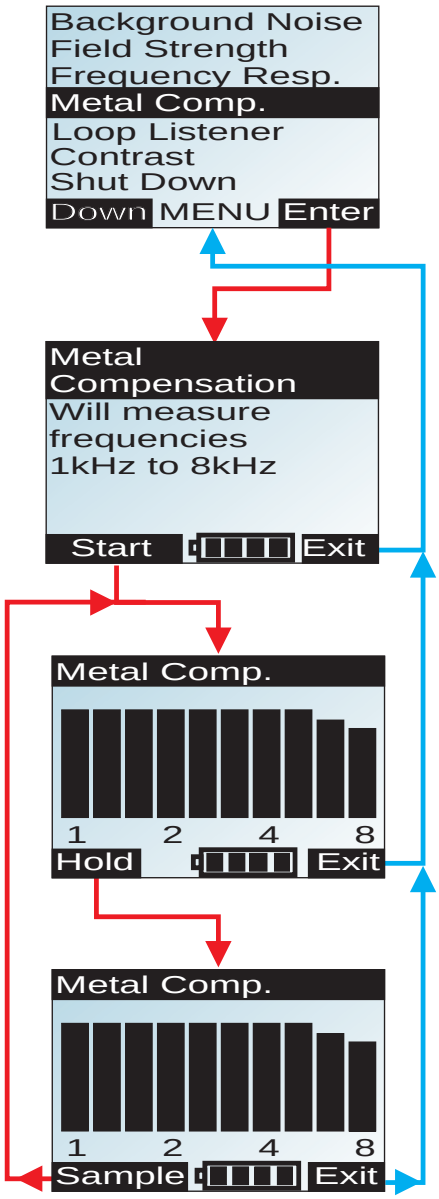
Metal Compensation Measurement

This test above and beyond the scope of BS EN 60118-4 and is designed to ensure losses due to building structure and furnishings do not cause poor signal quality at high audio frequencies. The FPRO measures frequencies 1 kHz through 8 kHz for use with amplifiers capable of metal compensation functions.
(It is advised that this test is performed at user subjective level.)

1. Set up the test equipment and power up the FPRO.
2. Activate the MP3 player and transmit the metal compensation sine wave track (Track 3).
3. From the main menu, select the 'Metal Compensation' menu option (see right).
4. Walk around the covered area and check good readings are achieved.

   Acceptable results: Bar readings are levelled out

5. If good readings cannot be achieved, adjust the 'Metal Compensation' control on the amplifier (if fitted) until a good range is displayed on the FPRO.
6. Carry out further checks at random within the covered area to confirm that the metal compensation is acceptable.



FREQUENCY RESPONSE MEASUREMENT

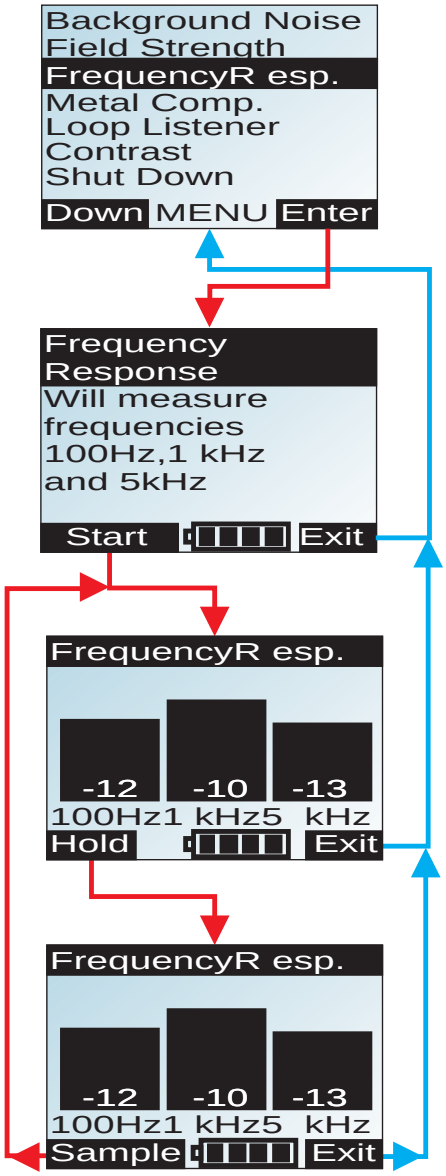
Frequency Response Measurement

This test is designed to ensure good speech intelligibility in the covered area. The FPRO detects 100 Hz, 1 kHz and 5 kHz frequencies in accordance with BS EN 60118-4 and presents the results in the style of an easy-to-read bar graph. (BS EN 60118-4 recommends this test is done at levels of -10 dB L.)

1. Set up the test equipment and power up the FPRO.
2. Activate the MP3 player and transmit the frequency response sine wave track (Track 2).
3. From the main menu, select the 'Frequency Response' menu option (see right).
4. Walk around the covered area and check good readings are achieved.

   Acceptable results: +/-3 dB L from a 1 kHz reference level

5. If good readings cannot be achieved, adjust the 'Metal Compensation' control on the amplifier (if fitted) until a good range is displayed on the FPRO.
6. Take readings and record the results on the AFILS Test Certificate.
7. Carry out further checks at random within the covered area to confirm that the frequency response is acceptable.



FPRO OPERATION

Pushbutton Controls

The FPRO's two blue 'soft' buttons (shown above) change their functions dependent on the menu option being accessed. The bottom section of the digital display denotes the buttons functions.

Which Button	Display Shows	Function
Left	Down	Scrolls vertically through the menu options (see Fig.1 & 2)
	+	Adjusts the display's contrast (see Fig.2)
	Shutdown	Shutsdown the FPRO (see Fig.3 & 4)
	Start	Starts a measurement test
	Hold	Holds a measurement reading on the display
	Sample	Restarts a measurement after a hold
Right	Enter	Selects a menu option (see Fig.1 & 2)
	Exit	Returns to main menu (see Fig.2)
	Prevent	Postpones the FPRO's auto shutdown (see Fig.3)
	OK	Acknowledges a display message (see Fig.4)

Power Up & Switch On
Remove the battery cover on the back of the FPRO and insert the 9 V battery (supplied). Switch on the FPRO by pressing and holding its left button.

Shutting Down
From the main menu, select the 'Shut Down' menu option (see Fig. 1).

Contrast Control
The contrast of the LCD can be changed between a value of 35 and 95. When the contrast reaches 95 the display rolls back to 35. From the main menu, select the 'Contrast' menu option (see Fig. 2).

Auto Shutdown & Battery Check
Auto shutdown occurs if none of the FPRO's buttons are pressed for 10 minutes (see Fig.3). If 'Prevent' is selected, the display returns to the last used menu option.

A battery level check runs in the background and warns the user if the level is low (see Fig.4). If OK is pressed the FPRO will run for 5 more minutes before the user is warned again.

Please note: Always carry out testing using a good battery.

Fig.1

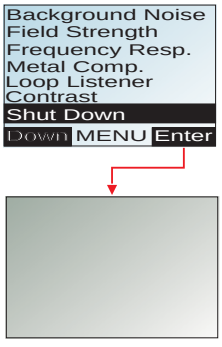


Fig.2

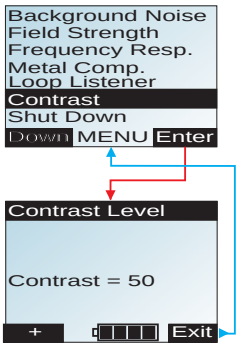


Fig.3

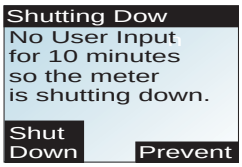
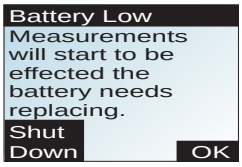


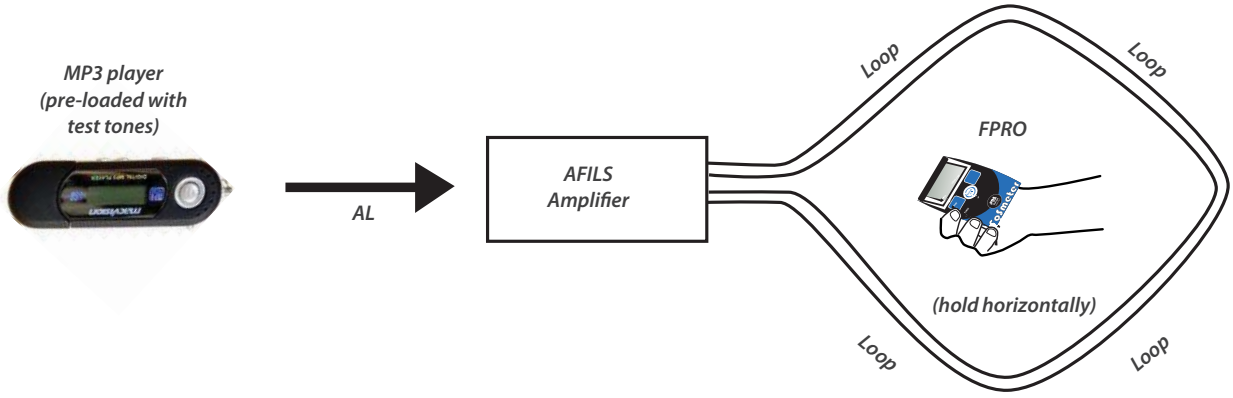
Fig.4



TESTING TO BS EN 60118-4

Test Equipment Set Up

1. Connect an audio source, e.g. MP3 player, CD player, to a suitable line input/phono input at the AFILS amplifier using a suitable AL test lead (see diagram below). Please note: AL leads are listed on page 1.



2. Switch on the amplifier and adjust the input signal control and loop drive current in accordance with the amplifier's manual.

Background Noise & System Noise Measurements

This test is designed to ensure that background and system noise levels of the site / system do not affect the intelligibility of the system in the covered area. Noise levels are measured by the FPRO and categorised as Acceptable, Tolerable or Too High in accordance with BS EN 60118-4.

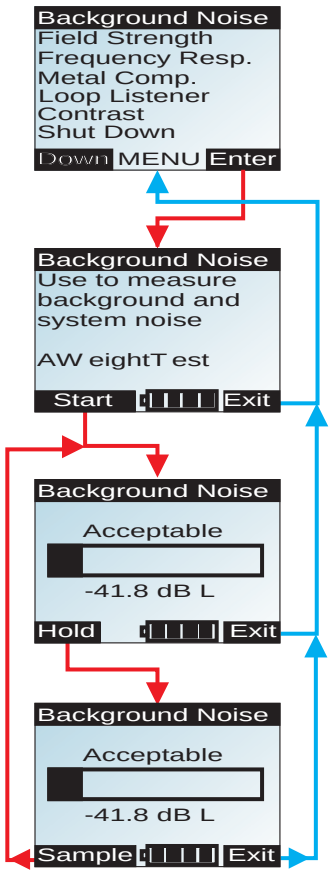
Background noise measurements should be taken before the AFILS is installed. Check if background noise levels in the covered area are acceptable for an AFILS to be installed.

System noise measurements should be taken after the AFILS is installed. With the amplifier switched on, all inputs muted, and other services
switched off, check if background noise levels in the covered area are acceptable.

1. Power up the FPRO.
2. From the main menu, select the 'Background Noise' menu option (see right).
3. Walk around the covered area and check good readings are achieved.

   ***Acceptable results:** > -42 dB L to < -32 dB L*
   ***Tolerable results:** > -32 dB L to < -22 dB L*
   ***Too High:** > -22 dB L (Bar will max out at -22 dB L)*

4. Take readings and record the results on the AFILS Test Certificate.
5. Carry out further checks at random within the covered area to confirm that the background noise is acceptable.

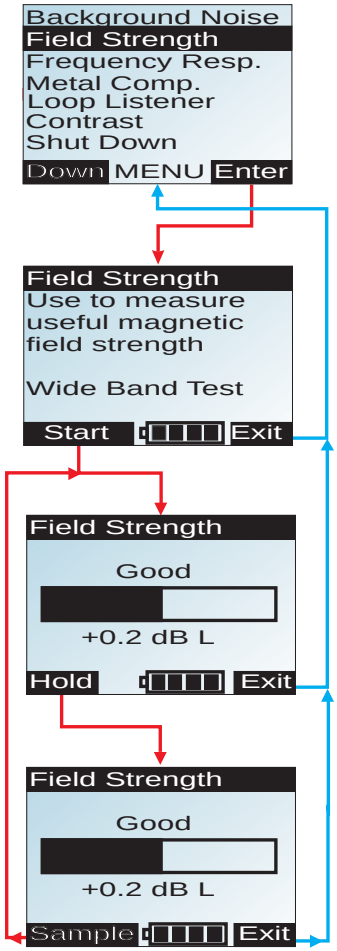


MAGNETIC FIELD STRENGTH MEASUREMENT

Magnetic Field Strength Measurement

This test is designed to ensure the loop signal provides sufficient volume without distortion in the covered area. The FPRO detects a pulsed 1 kHz signal in accordance with BS EN 60118-4 and is calibrated at 400 mA/m (i.e. 0 dB L).

1. Set up the test equipment and power up the FPRO.
2. Activate the MP3 player and transmit the pulsed 1 KHz sine wave track (Track 1).
3. From the main menu, select the 'Field Strength' menu option (see right).
4. Walk around the covered area and check that 400 mA (0 dB L) is achieved, ideally in centre of the loop.
5. If this cannot be achieved, adjust the 'Gain' or 'Drive Control' on the amplifier until a good reading is displayed on the FPRO. Adjust the field strength (highest peak) to 400 mA/m = 0 dB L (+/-3 dB L).
6. Take readings and record the results on the AFILS Test Certificate.
7. Carry out further checks at random within the covered area to confirm that the field strength is acceptable.

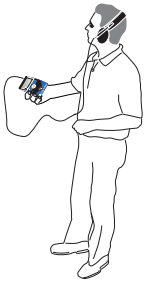


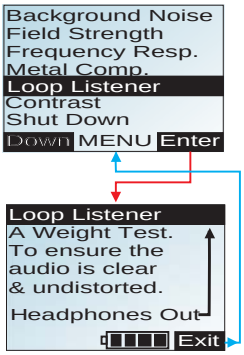
SUBJECTIVE / LOOP LISTENING TESTS

Subjective / Loop Listening Tests

This test is designed to ensure hearing aid users receive an undistorted and clear signal in the covered area from the system's actual inputs (microphones, music sources, etc.). The speech and music tracks, provided on the MP3 player, can assist with subjective testing. The installation of an AFILS is performed with the purpose of improving a service for the hearing impaired. Therefore, it is recommended that hearingaid users should be present when the loop system is initially commissioned to confirm that measurements taken reflect subjective tests. It is the opinion of these day-to-day users that should ultimately determine the output level of the system.

1. 1. Activate the system's actual input(s). Power up the FPRO and connect the HEAD1 headphones to the FPRO's 3.5 mm jack socket. In the event of no real system inputs, use the speech track (Track 4) and music track (Track 5) provided on the MP3 player.
2. From the main menu, select the 'Loop Listener' menu option (see right).
3. Walk around the covered area and check clear audio signals are achieved.
4. 4. If possible, confirm the audio signals are acceptable to actual hearing-aid users.





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