

# CMR3

## Calibrated Measuring Receiver

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### Box Contents:

- 1 x CMR3
- 1 x 3.5mm Jack to XLR plug cable
- 1 x Handbook (this document)
- 2 x AA batteries
- 1 x Certificate of Conformity



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## Safety:



**This symbol is used to alert the user to important operating or maintenance instructions.**



**The Lightning bolt triangle is used to alert the user to the risk of electric shock.**

1. It is important to read these instructions, and to follow them.
2. Keep this instruction manual in an accessible place.
3. No user serviceable parts. Refer all servicing to qualified personnel.
4. No objects filled with liquids, such as vases, shall be placed on the apparatus.



**WARNING:** Do not expose to dripping or splashing.

5. Clean only with a dry cloth.
6. Batteries should not be exposed to heat, sunshine or fire.

## Introduction

The **CMR3** (Calibrated Measuring Receiver) is designed for measuring the performance of audio frequency induction loop systems in accordance with the requirements of the international defining standard IEC 60118-4.

This standard establishes the target field strength and frequency response of the induction loop system within the usable volume. Tolerances are established for the various parameters, as well as acceptable levels for the background noise.

This CMR3 is intended to be used as a calibrated probe with audio analysers and measuring equipment, including software based audio analysers running on portable or fixed computers.

When used with a suitable signal source and analyser the various parameters of a loop system can be measured accurately. System performance can be evaluated, and losses due to the presence of metal in building construction can therefore be determined, ensuring that the system is set up to satisfy the requirements of IEC 60118-4.

## Operation

Remove battery cover located on the rear of the unit, and insert 2 x AA batteries as shown by the polarity indication inside the unit. If the unit is not used for an extended period, then the batteries should be removed.

The unit is switched ON / OFF by inserting / removing the 3.5mm plug into the balanced output socket of the unit. The green 'Power' LED will illuminate to indicate that the batteries are charged and have been inserted correctly.

## Connections

A magnetic field of 400mA/m RMS 1kHz sinewave will produce a 0dBu output signal from the balanced output using the cable provided. Connect this to suitable audio measuring equipment and use established procedures such as spectral analysis of pink noise for plotting frequency response.

If an Unbalanced (or single-ended) signal is required (e.g. for connection to a PC), then use one signal line (Tip or Ring) and the cable shield (Sleeve). The output signal level will then be 6dB lower than normal. Ensure that this change in level is accounted for when taking measurements.

Under no circumstances must a 2-pole (mono) plug be used, as the output is electronically balanced, grounding one side of the signal is not permitted and will cause malfunction of the unit, as well as inaccurate readings.

Signal Connection Cables – SCC – is a kit of cables available from Ampetronic to interface audio sources to audio inputs on loop systems. Ask Ampetronic for details or consult [www.ampetronic.co](http://www.ampetronic.co)

## Measurement Advice

An A-weighted filter is provided to permit correct measurement of the background noise level. Select the desired response using the push switch on top of the unit.

Switch position - OUT: Flat response

Switch position - IN: A-weighted response

For most installations the vertical magnetic vector is of interest as specified in IEC 60118-4. As a result the CMR3 must also be vertical (position and axis indicated on the unit) in order to measure this component of the magnetic field.

Situations may exist where the vector of interest is not vertical, and hence the CMR3 should be orientated in accordance with this e.g. places of worship, hospitals and recovery areas, where people may not be in an upright position.

In all cases the CMR3 should be positioned at ear or listening level. This is typically 1.2m whilst seated, or 1.7m when standing.

Avoid positioning the unit on or near metal while taking measurements as this may affect the magnetic field pattern, and hence yield incorrect results. For more information on the effects of metal on magnetic fields see: [www.ampetronic.co](http://www.ampetronic.co)

## Re-Calibration

Recommended 1 year from the time the equipment leaves Ampetronic. This can be extended to 1.5 / 2 years if no adjustments are necessary.

## Troubleshooting

*'Power' LED does not illuminate*

- Check that the output cable is plugged into the unit.
- Check that the batteries are fitted correctly as shown inside the unit.  
Reversing the battery polarity may damage the unit and invalidate the warranty.
- Try using new batteries – the LED will extinguish when batteries are low.



*No signal is received on the output cable*



- Ensure that the loop system is available and switched ON in the venue.
- Always hold the unit to match the coil orientation in a hearing aid.

## Specification:

Output: 3.5mm 3-pole jack socket – enables power when used.  
0dBu output for 400 mA/m RMS magnetic field at 1kHz.  
Active balanced signal <0.5% THD @ 1kHz  
Headroom 6dB before clipping (at minimum battery voltage)

Gain stability: Measured at 1kHz.

Change due to battery voltage	< 0.1dB
Change due to output loading	< 0.1dB
Change due to temperature	< 0.25dB
Overall gain change	< 0.5dB

Load Impedance: 600Ω

Frequency Response:

Flat: 85Hz - 6kHz ± 0.5dB

A-Weighted: -3 dB at 470Hz & 14 kHz as per EN61672-1:2003

Environmental: IP20, -10°C to +45°C, 20 – 90% relative humidity

Dimensions: 62 x 26 x 112mm,  
90g (excluding batteries and output cable)

Output Cable: 1.5m 3.5mm 3-pole jack plug to XLR plug. Balanced connection

Power: 2 x Alkaline AA / LR6 batteries

Power LED acts as battery condition monitor

<0.1W 1.8V to 3.2V, about 200 hours usage with alkaline cells.

## Warranty information

This product carries a five year parts and labour warranty from date of shipment from Ampetronic. To qualify for the five year warranty, the product must be registered at [www.ampetronic.co](http://www.ampetronic.co) (products/warranty), without which the warranty will be valid for two years only.

The warranty could be invalidated if the instructions in this handbook are not followed correctly, or if the unit is misused in any way.

The CMR3 is designed and engineered in England.

## Declaration of Conformity

The manufacturer: Ampetronic Ltd.

Address: Unit 2, Trentside Business Village, Farndon Road, Newark, NG24 4XB

Declares that the products: 'Induction Loop Receiver' Type Names CMR3

Conforms to the following Directive(s) and Norm(s):

Directive 2004/108/EC	EMC: EN 55103 (1&2) 2009
Directive 2006/95/EC	Safety: EN 60065:2002+A12:2011
Directive 2011/65/EU	RoHS

February 2014 – J.R. Pieters – Managing Director, Ampetronic Ltd.

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