

# SP5 Signal Processor

## Phase shift & Metal Loss Corrector

### Handbook Contents:

- Safety
- Introduction
- Operation
- Troubleshooting
- Specification
- Accessories
- Warranty Information
- Declaration of Conformity

### Box Contents:

- 1 x SP5
- 1 x 15V Power cable
- 2 x 3-pole jack to jack cable
- 1 x Handbook (this document)
- 1 x SP5 connection drawing

### 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.

# AMPETRONIC

*Listen to the difference*

## Introduction:

The SP5 is a signal processing module designed for use with Ampetronic's range of professional rack mounted loop drivers.

It provides:

- 90° phase shift between outputs (from a single input), which is required for specially designed low loss and low spill systems.
- Metal Loss Correction (MLC) for counteracting the frequency dependant losses due to metal – near the location of the loop – in the structure of a building. This is adjustable between 0dB to 3dB per octave, and pivots around 1kHz.

*Note: The SP5 will not compensate for magnetic field strength loss due to metal at 1 kHz. This must be overcome by additional current from the loop drivers, and / or loop design techniques.*

## Operation:

### 1. Mounting.

The SP5 can be 19" rack mounted using the RM-1U tray (other units may be mounted on the tray as well). Alternatively, locate the SP5 elsewhere in the equipment cabinet with the loop amplifiers.

### 2. Connections and adjustments.

Connect the SP5 to the loop amplifiers as shown on the 'SP5 connection drawing' using the cables supplied.

Set all MLC controls (both on loop drivers, and SP5) to minimum: 0dB/oct.



Do not extend the cables supplied with the SP5, (except as advised by Ampetronic) otherwise interference may be introduced into the system.

### 3. System setup.

The SP5 acts as a signal processing device in between two (or more) amplifiers – providing the necessary phase shift and common MLC.

*Note: Amplifier control details (other than MLC adjustment) and system commissioning procedures are not detailed here.*

The following observations should be true if the SP5 and amplifiers are connected and adjusted correctly:

- Only the 'Master' amplifier should have 'Compression' LEDs active when audio signals are fed into the system.
- All amplifiers are delivering a similar current (unless instructed in project specific design notes).
- The MLC control on the SP5 is the only one adjusted (see 4. MLC adjustment) to compensate for frequency dependant losses. All amplifier MLC controls should be set to 0dB/oct.

If these conditions are not fulfilled, contact Ampetronic for advice.

#### 4. MLC adjustment

To determine the correct setting for the MLC, measure the frequency response of the system, and adjust to the MLC to achieve:

*100Hz - 5kHz  $\pm$ 3dB (relative to 1kHz).*

This can be done using a Field Strength Meter (FSM), or suitable audio analyser (with 1/3 octave measurements), and CMR3 field probe.

If these are not available – adjust for best sound quality whilst listening to the loop signal with an Induction Loop Receiver (ILR3).

#### **Troubleshooting:**

The signal in the amplifier loop monitor socket sounds ‘harsh’ or ‘tinny’

- This is because the loop monitor socket listens directly to the loop current. It will sound this way if the MLC is adjusted to boost higher frequencies and compensate for the losses in the metal structure. The signal heard using a loop receiver or field strength meter is what is important.

Compression LEDs lit on Master, but no Current can be delivered

- Check Master ‘A’, and Slave ‘B’ cables are not reversed

#### **Specification:**

Frequency Response:	85Hz - 6kHz $\pm$ 0.5dB (MLC set to minimum, 0dB/oct)
Metal Loss Correction:	Adjust to set 0 to 3dB per octave boost across the band At all settings, the unit has unity gain at 1kHz.
Input / Output A:	3-pole ¼" jack socket – for ‘Master’ amplifier Maximum cable length 1m <0.5% THD @ 1kHz
Output B:	3-pole ¼" jack socket – for ‘Slave’ amplifier Maximum cable length 1m <0.5% THD @ 1kHz
Environmental:	IP30 -10°C to +35°C 20 – 90% relative humidity
Dimensions:	1U high, 1/6 <sup>th</sup> rack width, install using RM-1U rackmount kit Width 71mm Depth 118mm Height 44mm Weight 350g
Power:	$\pm$ 15V DC 1W max

#### **Accessories:**

Visit our website [www.ampetronic.com](http://www.ampetronic.com) for details of Ampetronic products such as FSM, ILR3 and CMR3 for measuring and listening to loop systems.

## 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.com](http://www.ampetronic.com) (products/warranty), without which the warranty will be valid for two years only.

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

The SP5 is designed and engineered in England by Ampetronic Ltd.

## Declaration Of Conformity

Manufacturer:

Ampetronic Ltd.

Address:

Northern Road, Newark,  
Nottinghamshire, NG24 2ET.  
United Kingdom.

Declares that the product:

Description: Signal Processor

Type Name: SP5

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

Directive 2004/108/EC

EMC: BS EN 55103-1:2009 Emission

EMC: BS EN 55103-2:2009 Immunity

Directive 2006/95/EC

Safety: BS EN 60065:2002

January 2011

L.A. Pieters

Managing Director

Ampetronic Ltd.

Ampetronic Ltd.  
Northern Road, Newark,  
Nottinghamshire. NG24 2ET  
United Kingdom

Tel: +44 (0) 1636 610062

Fax: +44 (0)1636 610063

[www.ampetronic.com](http://www.ampetronic.com)

Email: [sales@ampetronic.com](mailto:sales@ampetronic.com)