1. Safety instructions

- In order to avoid damage to the sensor resistor, adhere strictly to the current and power limits mentioned below.
- Do not exceed a maximum duration of 15 s for a maximum current of 20 A, while taking readings. Allow the sensor to cool for 10 mins.
- Use safety connection leads.

2. Description

Sensor box for measuring electric current in AC and DC circuits.
Shunt resistance measurement method.
For connecting inputs and outputs, use experiment leads with 4-mm banana plugs.
CAUTION: This sensor box is not automatically recognised by the interface.

2.1 Contents
1 Sensor box

3. Technical data

<table>
<thead>
<tr>
<th>Measurement range:</th>
<th>0 to ±10 A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. current:</td>
<td>±20 A for 15 s</td>
</tr>
<tr>
<td>Sensor type:</td>
<td>Shunt resistance</td>
</tr>
<tr>
<td>Accuracy:</td>
<td>&lt;1 %</td>
</tr>
</tbody>
</table>

5 mΩ / 2 W

4. Operation

- Insert into the current path via the sockets \( I^+ \) and \( I^- \), maintaining the proper polarity for DC. When measuring AC, the polarity is not significant.
- Set up a connection from the sockets \( U^+ \) and \( U^- \) to the sockets \( U_{AM} \) or \( U_{BM} \) of the 3B NET/log™ interface, maintaining the proper polarity.
5. Sample experiment

5.1 Measuring the magnetic field of a current-carrying coil

Apparatus required:
- 1 3B NET/log@230 V 1000540
- or
- 1 3B NET/log@115 V 1000539
- 1 High-current sensor 1000545
- 1 Magnetic field sensor 1000558
- 1 Field coil 1000591
- 1 DC power supply unit 16 V/20 A 1002771
- 1 Set of 15 experiment leads 1002841

- Set up the experiment according to Fig. 1
  In order to build up a measurable magnetic field, a current of up to 10 A must flow into the field coil. At 10 A, the high-current sensor supplies a voltage of 50 mV which is proportional to the current. The selected measurement range is 200 mV at the employed voltage input of the interface.
- Connect the magnetic field sensor to the interface.
- Increase the current in the field coil from 0 to 10 A in steps of 0.5 A and record the corresponding flux density (Fig. 2).

Fig. 1: Measuring the magnetic field of a current-carrying coil

Fig. 2: Magnetic field against current