



***Time Electronics***  
*Calibration, Test and Measurement*

# User Manual

## 9780 Clamp Meter Adaptor

Revision 2211-1

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This also applies to any schematics, drawings and diagrams contained herein.

This manual provides operating and safety instructions for the Time Electronics product.

To ensure correct operation and safety, please follow the instructions in this manual.

Time Electronics reserves the right to change the contents, specifications and other information contained in this manual without notice.

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# 1 Introduction



The 9780 is an adaptor designed for use with Time Electronics multifunction calibrators, or calibrated AC or DC sources. It enables accurate calibration and verification of a wide range of clamp-type meters.

The unit features twin coils built into a high insulation base plate, with a foam mat for positioning the clamp meter being calibrated. Three heavy duty terminals with removable caps provide connection from the calibrator to the clamp adaptor.

The black central terminal is the common negative connection. Then two red terminals allow selection of the x1 or x50 turn coils. The low resistance test lead set supplied is made of multi-strand (735/0.12 mm) oxygen free copper and is terminated with 8 AWG gold plated ring and plug terminals.

When used with a high current multifunction calibrator, the 9780 provides a practical method of calibrating clamp meters up to 1100 A. Models suitable for this application include the 5025E, 5025C, 5051+ calibrators, as well as the 7051+ CalBench module.

## 2 Operation



### 2.1 Important Warnings



**Duty Cycle:**

The 9780 is rated for continuous operation at 10 A.  
At 22 A the duty cycle should be a maximum of 3 minutes on and 6 minutes off.  
Do not exceed this.



**Caution Hot Surface:**

The surface of the coils can become hot. Do not touch.

## 2.2 Principle of Operation

When a current passes through a cable it creates a magnetic field proportional to the current. The clamp meter jaws measure this field. If the same wire (with the same current) passes through the jaws again, the clamp meter will read double. If we pass 50 turns through the jaws, the clamp meter will read 50 times (x50) the actual current passing through the cable.

## 2.3 x1 and x50 Coils

The 9780 is fitted with 2 main coils. A single turn coil (x1) and a 50 turn coil (x50). The x50 turn coil can effectively multiply the current by a factor of 50, allowing current clamps to be calibrated up to 1100 A.

## 2.4 Leads and Connections

The 9780 is supplied with a special set of high current connections leads. The binding post screw cap on the 9780 must be fully removed and the ring terminal placed over the post. Make sure the 9780 binding post screw caps are tight and the plugs are fully inserted into the 7051 before performing any calibrations.

## 2.5 Duty Cycle and Heating

The 9780 is rated for continuous operation at 10 A. At 22 A the duty cycle (on/off time) should be, a maximum of 3 minute on and 6 minutes off. When used with older style clamp meters where substantial operating power is required it should be noted that additional power will be required from the current source. If the clamp coils are too hot to touch, then the current source should be removed until the coils have cooled. There is no chance of electric shock from the coils.

## 2.6 Current Source

Not all calibrators have the required compliance voltage to drive the 9780 to its full rating. It should also be noted that some clamp meters apply additional loading and the power required to drive the 9780 is increased. In this situation the compliance voltage may not be sufficient to drive the x50 coil to its full rating.

Immediately applying the maximum current to the 9780 may cause the output of the high current source to trip. To avoid this, apply a lower current and slowly increase the high current source until the desired current is reached.

For example, to reach 20 A, start at 18 A and increment the output in 0.1 A steps.

## 2.7 Jaws less than 20 mm Diameter

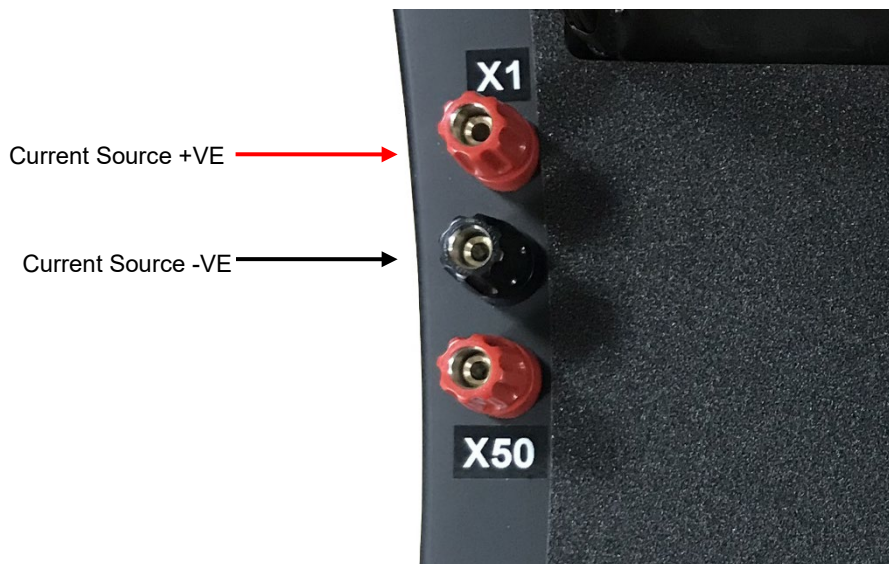
Some current clamps have very small jaws that will not fit around the coils. It is possible to utilise one side of the coil, which provides 25 turns. If this method is used the connection is made to the x50 terminal. If the jaws are less than 15 mm diameter it is possible to use a single high current test lead (TE 9546 for example) connected to directly to the calibrator.

## 2.8 Test Setup

Three terminals are available on the side of the 9780.

To use the x1 turn coil connect the test leads supplied from the calibrator to the x1 red terminal and the black common terminal.

x1 Turn Connection



To use the x50 coil connect the leads to the x50 red terminal and the black common terminal.

x50 Connection

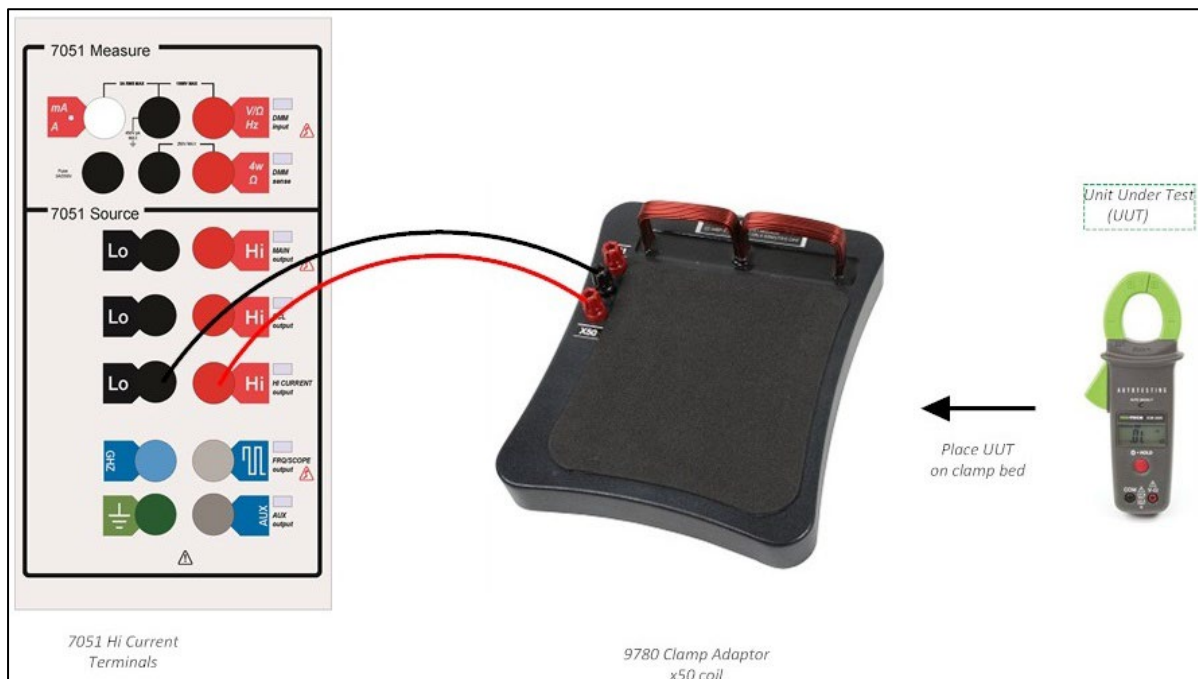


## 2.9 Example Connections

### 2.9.1 Example Model 5025 connection:



### 2.9.2 Example CalBench Module 7051+ connection:





## 2.10 Positioning the Clamp Meter

Place the clamp meter on the 9780 bed, with the jaws clamped around the coil.

Make sure the coil is aligned centrally with the markers on the jaws.



Follow the instructions in the calibrator manual to output the specific current that will be multiplied by the adaptor.

## 3 Specifications

**Maximum Current:** 22 A.

**Current loops:** 2 provided: a 1 to 1 ratio and a 50 to 1 ratio.

Calibrator Output	Freq	Amp Turns	Accuracy (% of output)	Floor (Amps)
0.2 A to 2.2 A	DC	10 - 110	0.5	0.05
2.2 A to 22 A	DC	110 - 1100	0.5	0.15
0.2 A to 2.2 A	45 to 65 Hz	10 - 110	0.5	0.2
0.2 A to 2.2 A	65 to 90 Hz	10 - 110	1	0.25
2.2 A to 22 A	45 to 65 Hz	110 - 1100	0.5	0.7
2.2 A to 22 A	65 to 90 Hz	110 - 1100	1	0.9

The above specification applies for use with general purpose clamp meters such as the Fluke 801-1000 or LEM LH1020.

Specifications quoted do not include errors due to the current source. The current source accuracy should be combined with the accuracy of the 9780 to determine the total uncertainty.

## 3.1 General Specifications

**Maximum allowed primary current:** 22 A RMS. The frequency range is 45 to 90 Hz.

**Series resistance:** 1 turn coil = approximately 1 m $\Omega$ .  
50 turn coil = 0.11  $\Omega$ . Inductance = 1 mH.



**Operation ratings and Duty Cycle:**

The 9780 is rated for continuous operation at 10 A.  
At 22 A the duty cycle should be a maximum of 3 minutes on and 6 minutes off.



**Operational Warning:**

It is possible if the duty cycle is exceeded, the coils can become hot to the touch.

**Maximum drive voltage:** 3 V DC or 3 V RMS AC.

**Dimensions / Weight:** W 240 x D 280 x H85 mm / 3.9 kg.

**Supplied with:** High current test lead set (part # 9503).

**NOTE:** When used with older style clamp meters where substantial operating power is required it should be noted that additional power is required from the current source.

For example a 1000 A Ferranti clamp-on ammeter requires at least 50 % more power from the current source. This will require increased power transfer through the clamp meter adaptor and therefore the on to off time should be increased to 1 to 10 ie 1 minute on and 10 minutes off.

## 4 Warranty and Servicing

### Warranty

Time Electronics products carry a one-year manufacturer's warranty as standard.

Time Electronics products are designed and manufactured to the highest standards and specifications to assure the quality and performance required by all sectors of industry. Time Electronics products are fully guaranteed against faulty materials and workmanship.

Should this product be found to be defective, please contact us using the below details. Inform us of the product type, serial number, and details of any fault and/or the service required. Please retain the supplier invoice as proof of purchase.

This warranty does not apply to defects resulting from action of the user such as misuse, operation outside of specification, improper maintenance or repair, or unauthorized modification. Time Electronics' total liability is limited to repair or replacement of the product. Note that if Time Electronics determine that the fault on a returned product has been caused by the user, we will contact the customer before proceeding with any repair.

### Calibration and Repair Services

Time Electronics offers repair and calibration services for all the products we make and sell. Routine maintenance by the manufacturer ensures optimal performance and condition of the product. Periodic traceable or accredited calibration is available.

### Contacting Time Electronics

**Online:**

Please visit **[www.timeelectronics.com](http://www.timeelectronics.com)** and select Support Request from the Contact links. From this page you will be able to send information to the Time Electronics service team who will help and support you.

**By phone:**

+44 (0) 1732 355993

**By email:**

[mail@timeelectronics.co.uk](mailto:mail@timeelectronics.co.uk)

## Returning Instruments

Prior to returning your product please contact Time Electronics. We will issue a return merchandise authorization (RMA) number that is to accompany the goods returning. Further instructions will also be issued prior to shipment. When returning instruments, please ensure that they have been adequately packed, preferably in the original packing supplied. **Time Electronics Ltd will not accept responsibility for units returned damaged.** Please ensure that all units have details of the service required and all relevant paperwork.

Send the instrument, shipping charges paid to:

### **Time Electronics Ltd**

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Tonbridge, Kent, TN9 1RA.  
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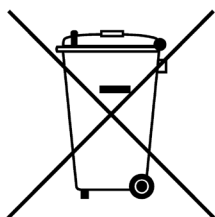
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## Disposal of your old equipment



1. When this crossed-out wheeled bin symbol is attached to a product it means the product is covered by the European Directive 2002/96/EC.
2. All electrical and electronic products should be disposed of separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities.
3. The correct disposal of your old appliance will help prevent potential negative consequences for the environment and human health.
4. For more detailed information about disposal of your old appliance, please contact your city office, waste disposal service or return to Time Electronics.