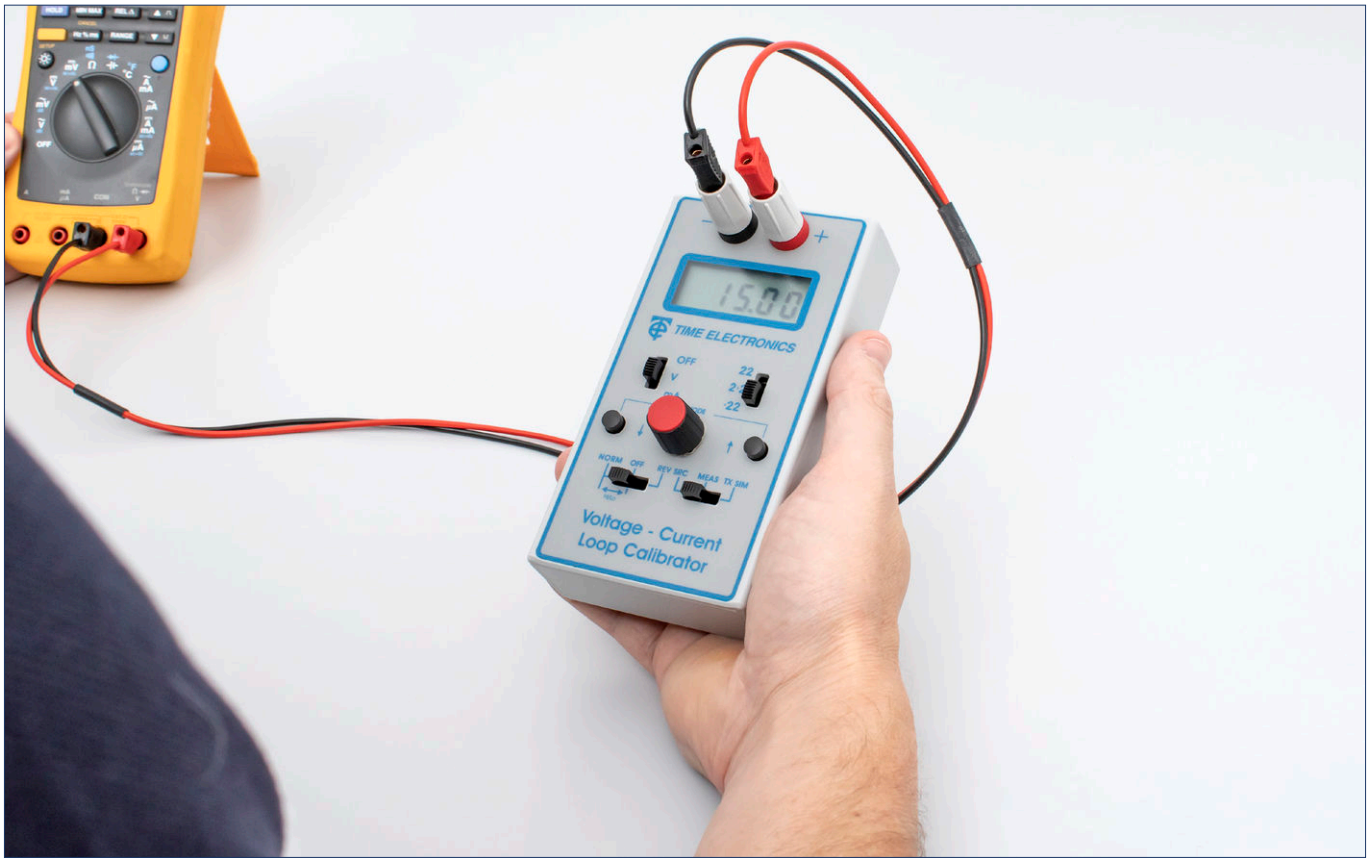
Time Electronics
1048 Voltage / Current / Loop Calibrator



Description

A portable instrument that operates as a current and voltage source and a multi-purpose loop calibrator. High performance and simple operation make it suitable for R&D, service, process control engineers, and calibration technicians. As a versatile handheld calibrator, the source and measure capabilities with 0.02 % accuracy mean the 1048 is a compact solution for most simulation and test applications.

The 1048 combines the advantages of digital accuracy with analog control. Based on the popular functionality of the Time Electronics 1044 calibrator, the 1048 offers higher voltage and current across the three ranges, and improved accuracy. The additional features of transmitter simulation, sink loop control, output stepping and ramping, and incremental fine adjustment make the instrument ideal for use in the process industry.

The large, easy to read 4.5 digit LCD display shows the actual output, even when the connected load exceeds the specifications. This important feature eliminates the risk of large errors when connecting to unknown loads. The display also indicates if the battery becomes critically low.

In the source mode, voltage up to 22 V and current up to 22 mA may be generated in three ranges. When in current source mode the 1048 has a high 24 V compliance voltage which is ideal for powering process loops. In the measurement mode, the range and function can be easily selected, with the measured input accurately shown on the display.

The step, ramp, and inching functions are simple operation, with no key press menus to learn, just switches and buttons. A multi-turn potentiometer controls the output, with up/down incrementing buttons for fine control. The output can be reversed (+/-) and zeroed at the flick of a switch. The automatic ramp function enables the user to choose either 5, 11, or 21 point calibration. Manual operation can be quickly restored by a single push of a button.

The 1048 is housed in a pocket sized ABS case, with carry case supplied as standard. Connections are by standard 4 mm plugs or by clamping the wires under the terminals. A single 9 V battery powers the unit or an external 12 V DC power supply may be used which disconnects the internal battery.

Features

- Source/measure voltage and current
- 3 source ranges: 0 to 22 mA and 0 to 22 V
- 3 measure ranges: 0 to 70 mA and 0 to 50 V
- Accuracy 0.02 %
- Transmitter simulator/sink loop control
- Output steps and ramps
- Fine adjustment (inching)
- 20 hours typical battery life
- Optional mains power supply (230 V and 110 V available)

Applications

Common use of the 1048 is to simulate a transducer or measure the current flow in a transducer loop. The 1048 can be used to check a 4 to 20 mA system in either source or measure modes of operation, with the 24 V compliance voltage powering the loop when current source mode is selected.

In the source mode, the 1048 may be used to calibrate meters, thermocouple indicators, data loggers, for signal injection, semiconductor characterisation, or as a backing off source. In the measure mode, the 1048 may be used in the same way as a digital multimeter, checking DC voltages and current over 3 ranges with excellent resolution and accuracy.

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Technical Specifications

Voltage source

Range	Resolution	Accuracy	Output current	Temp coefficient
0 to 220 mV	10 µV, 100 µV above 0.2 V	0.05 % of FS	20 mA	± 6 ppm/°C
0 to 2.2 V	100 µV, 1 mV above 2 V	0.02 % of FS		
0 to 22 V	1 mV, 10m V above 20 V	0.02 % of FS		

Voltage measure

Range	Resolution	Accuracy	Measure load	Temp coefficient
0 to 220 mV	10 µV, 100 µV above 0.2 V	0.05 % of FS ± 1 digit	1 MΩ	± 3 ppm/°C
0 to 2.2 V	100 µV, 1 mV above 2 V	0.02 % of FS ± 1 digit	1 MΩ	
0 to 22 V	1 mV, 10 mV above 20 V	0.02 % of FS ± 1 digit	10 MΩ	

Current source

Range	Resolution	Accuracy	Output voltage	Temp coefficient
0 to 220 µA	10 nA, 0.1 µA above 200 mA	0.05 % of FS	24 V Max	± 12 ppm/°C
0 to 2.2 mA	0.1 µA, 1 µA above 2 mA	0.02 % of FS		
0 to 22 mA	1 µA, 10 µA above 20 mA	0.02 % of FS		

Current measure

Range	Resolution	Accuracy	Input load	Temp coefficient
0 to 220 µA	10 nA, 0.1 µA above 200 mA	0.05 % of FS ± 1 digit	1 kΩ	± 8 ppm/°C
0 to 2.2 mA	0.1 µA, 1 µA above 2 mA	0.02 % of FS ± 1 digit	110 Ω	
0 to 22 mA	1 µA, 10 µA above 20 mA	0.02 % of FS ± 1 digit	16 Ω	

Settings and General Specifications

Sink (Tx Sim)..... 2 wire transmitter simulation: External excitation voltage, 3 V min, 50 V max.
The current sink levels are adjustable,with accuracies as per the 3 source ranges shown above.
Note: Accuracies in all measure modes are ± 1 digit.

Output steps ..... 5 fixed 4 mA steps for current output 4, 8, 12, 16 and 20 mA.
11 fixed 1 V steps for voltage output 0,1,2...10 V.
21 fixed steps 1 V/1 mA for V and I output 0,1,2...20.
Stepping can be done manually or automatically (Autostep). Stepping speed is adjustable (1 - 9 sec/step).
Dwell time (top and bottom) is one step period. In step mode the accuracy is limited to 0.05 % of span ± 1 digit.

Output adjustment..... A ten turn potentiometer for quick setting, with fine adjust using up/down increment buttons.

Connections..... Made by 4 mm connectors or clamped using the wire compression feature.

Power..... PP3 size, 9 V battery. Approximately 20 hours life depending on the current sourced.
Alternatively an optional 12 V power supply can be plugged into the 2.5 mm socket on the top of the unit.

Protection..... The 1048 can withstand open circuits, short circuits and reverse polarity up to 25 V. Additional protection is by an internal fuse.

Operating temperature ..... –10 to 50 °C.

Storage temperature..... –30 to 70 °C.

Operating humidity..... 0 to 90 % non-condensing at 25 °C.

Dimensions ..... H 142 x W 78 x D 50 mm.

Weight..... 0.30 kg.

Optional extras ..... 230 V or 110 V mains power supplies. Calibration certificates: Traceable (Factory) and Accredited (ISO 17025).

Country of origin..... UK.

Ordering Information

1048..... Voltage/Current/Loop Calibrator

7643..... Mains power supply (230 V)

7652..... Mains power supply (110 V)

C176..... Traceable calibration certificate (Factory)

C138..... Accredited calibration certificate (ISO 17025)

Due to continuous development Time Electronics reserves the right to change specifications without prior notice.

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