



1021 DC Current Source with Null Indicator

Time Electronics

Calibration, Test & Measurement

- **100mA output with overload protection**
- **0.02% Accuracy**
- **Wide range of applications**
- **Safety terminals**
- **Removable protective boot**
- **Battery level indicator**



The **1021** is a precision DC Current Source suitable for calibration and test applications from micro-amp levels up to 100mA.

The 100mA output with overload protection is based on the popular Time Electronics type 1007 millivolt source and incorporates many of the well-proven features. The instrument is overload protected and a front panel indicator shows when insufficient drive voltage is available. Maximum output voltage is adjustable between 14 volts and 40 volts, with a maximum output power of 2.4 watts.

The unique circuit design ensures that it stays well within specification for at least 12 months. Variation with temperature is better than 60 ppm per °C, and typically better than 20 ppm per hour at constant temperature. To improve the switch reliability, additional back-up contacts have been used – even if a contact fails, the 1021 will still operate correctly.

The accuracy and stability are such that a wide range of applications are possible. In the process industries it may be used to test and calibrate current sensitive transducers, and their associated indicating and recording instruments. The semiconductor industry requires constant current sources for parameter measurements. It may also be used to measure DC current accurately by using the null facility to back off the unknown current. Resolution of 1µA is possible.

The 1021 is housed in a robust metal case and a removable protective boot is supplied as standard. The front panel safety terminals are compatible with 4mm shrouded plugs, as well as standard plugs, bare wires, and spade terminals.

Rechargeable batteries give portable operation and a mains re-charger is supplied with the unit. Complete recharge time is 10-12 hours although sufficient charge for a few hours operation can be obtained with only 1/2 hours' charge. Overnight recharge is sufficient to fully charge the batteries, which give up to 10 hours of typical operation. The mains recharger is supplied as standard with the 1021 and connects with a socket on the top panel.

1021 Applications

Transducers

The ability to source and measure current makes the 1021 ideal for testing and calibration of many types of current transducer and their associated measuring equipment.

Semiconductor Parameters

The 1021 covers many applications in a wide variety of semiconductor measurements including; forward voltage drops, zener diode characteristics and temperature coefficients, transistor gains (hfe) and saturation voltages. Characteristic curves of devices can be easily plotted by selecting suitable output currents on the 1021. It can also be used to drive Hall effect devices.

Resistance and Temperature Measurement

Low ohm and contact resistance of relays, switches, connectors, etc can be easily measured using the 1021 as the current source in a 4-terminal kelvin system where lead and probe resistance do not affect the accuracy of the reading. This method can also be used in thermometry for calibration and measurement of platinum-resistance thermometers and thermistors.

1021 Technical Specifications

Output:	0 - 99.99mA in 3 ranges: 0 - 99.99mA in 10 μ A steps 0 - 9.999mA in 1 μ A steps 0 - 999.9 μ A in 0.1 μ A steps
Accuracy:	+/- 0.02% of setting +/- 0.02% of range +/- 0.02 μ A
Voltage Capacity:	Adjustable between 14 and 40 volts. Maximum output power 2.4 watts.
Out of Limit Warning:	A front panel indicator provides indication of insufficient drive voltage.
Output Polarity:	Positive or negative switch selected. A centre 'off' position provides an open circuit on the output terminals.
Output Stability:	Better than 60 ppm per $^{\circ}$ C (-10 $^{\circ}$ C to +50 $^{\circ}$ C). Better than 25 ppm per hr (at constant temperature).
Output Noise:	Less than 15 ppm of full scale
Load Regulation:	Better than 20 ppm per volt change in output.
Null Sensitivity:	Adjustable from \pm 20mA to \pm 20 μ A FSD via front panel control. Maximum resolution is 1 μ A.
Power Supply:	NiCad rechargeable batteries with external mains re-charger. Standard mains voltage is 220-250 50/60 Hz. 100-125 V 50/60 Hz is available but should be specified on ordering.

General Specification

Dimensions:	200 x 75 x 110mm (215 x 100 x 120mm including protective boot)
Weight:	1kg (1.4kg including protective boot)
Optional Extras:	Carry Case Calibration Certificates – traceable to NPL and UKAS
Country of Origin:	UK

Ordering Information

Code	Description
1021	DC Current Source with Null Meter (mains charger and protective boot included)
9027	Leatherette Carry Case
9153	Factory (NPL Traceable) Calibration Certificate
9105	UKAS Calibration Certificate (ISO 17025)

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

Time Electronics, Botany Industrial Est. Tonbridge, Kent. England. TN9 1RH.
Tel: +44 (0)1732 355993 Fax: +44 (0)1732 770312 E-mail: mail@timeelectronics.co.uk

www.timeelectronics.com

V1b 06/04/09