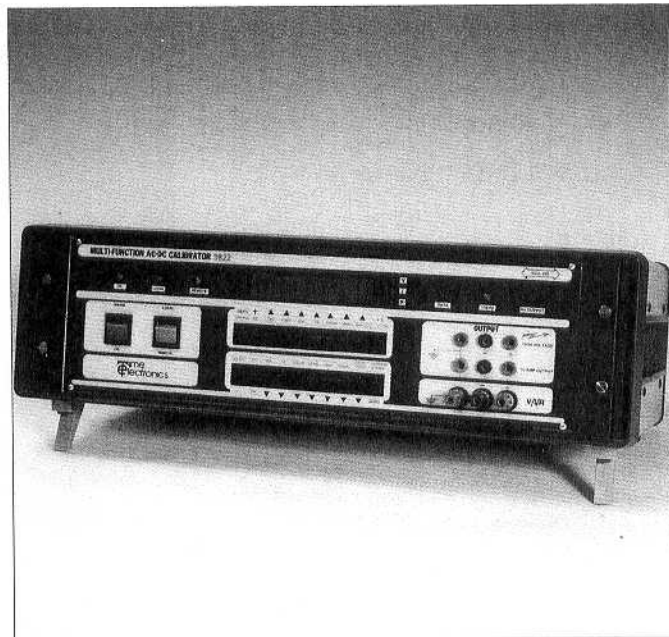




Data Sheet 9822 Programmable Multi-Function Calibrator

- 0 - 1kV AC/DC Voltage
- 0 - 10A AC/DC Current
- 10 Ω - 10M Ω Resistance
- Autocal facility
- IEEE-488 interface
- 2 Year warranty



Introduction

Multimeter Calibration

The 9822, with AC/DC voltage and current ranges plus resistance makes it suitable for the calibration of analogue and digital multi-meters typically up to 6 digit resolution. The IEEE-488 interface allows automatic control and provides the accuracy and speed needed for low cost calibration of large numbers of multi-meters.

IEEE Interface as Standard

The 9822 comes with the IEEE-488 interface as standard and the intelligent microprocessor allows the 9822 to be programmed with high level commands.

Deviation and Zero Offset Function

When selected, the deviation function will allow the output to be adjusted directly as a percentage. This can be used to show the error of a unit under test immediately. The zero offset function allows compensation of zero offset values. These features combined are particularly useful for linearity checks.

19999 Full Scales with 5% Over-Range

For accurate calibration of DMM's, the ranges on the 9822 have been designed to match the full scales of most digital meters.

Built-in 10 Amp Range.

There is no need to use bulky add-on amplifiers for high current generation as the the 9822 has a 10 amp range built in.

Autocal

With autocal, recalibration of the 9822 can be made from the front panel controls or the IEEE bus. Low cost recalibration is therefore possible using IEEE programmable standards. An interlock facility is provided to ensure calibration integrity.

Safety

Emphasis has been placed on safety features. High voltage (40V - 1100V), and the 10 amp range have separate output terminals. On selection of an output greater than 40V, there is a programmed 3 second delay, an audible warning beep and a continuous flashing warning light on the front panel. Output short circuit protection is provided on all ranges and error messages are displayed when invalid functions are selected.

6 Wave Forms from 15 Hz - 20 kHz

Square, trapezoidal, sine, triangular, ramp up, ramp down and a half wave are all provided for true R.M.S. calibration work. An additional slow sweep output will check for stiction on analogue meters.

Self-Test and Internal Error Detection

The 9822 self-test program can be run at any time to check that all functions are operating correctly. Additionally, the internal error detection system continuously monitors circuits within the instrument and output load conditions for errors.



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Specifications

The accuracy specifications given below apply for a period of 1 year at a temperature of 20°C ± 2°C, after a minimum warmup period of 1 Hour, relative to calibration standards. Specifications describe maximum conditions and apply from 10%-100% of range. Specifications stated in ppm and as ± output ± range.

D.C. VOLTAGE

| RANGE | 24 HOUR STABILITY | 90 DAY | ACCURACY 180 DAY | 1 YEAR | T.C. ppm/°C | OUTPUT RESISTANCE | DRIVE CURRENT | RESOLUTION |
|-------|-------------------|--------|------------------|--------|-------------|-------------------|---------------|------------|
| 20mV | 10+5 | 20+5 | 25+5 | 30+5 | 5 | 10Ω | S/C | 20nV |
| 200mV | 7+5 | 20+5 | 25+5 | 30+5 | 4 | 10Ω | S/C | 200nV |
| 2V | 3+2 | 20+5 | 25+5 | 30+5 | 3 | 0.1Ω | 100mA | 2uV |
| 20V | 3+2 | 20+5 | 25+5 | 30+5 | 3 | 0.1Ω | 100mA | 20uV |
| 200V | 15+10 | 35+10 | 40+10 | 50+10 | 5 | 10Ω | 10mA | 200uV |
| 1kV | 15+10 | 35+20 | 40+20 | 50+20 | 5 | 10Ω | 10mA | 2mV |

Note : All specifications ± 4uV. Noise : 20mV to 20V ranges = 1ppm of range, 200V to 1kV ranges = 5ppm of range (0.1Hz to 1Hz RMS.)

A.C. VOLTAGE (Sine Wave)

| RANGE | FREQUENCY | 24 HOUR STABILITY | 90 DAY | ACCURACY % 180 DAY | 1 YEAR | T.C. ppm/°C | OUTPUT RESISTANCE | OUTPUT CURRENT |
|-------|-----------|-------------------|------------|--------------------|------------|-------------|-------------------|----------------|
| 20mV | 40Hz-1kHz | 0.01+0.005 | 0.03+0.008 | 0.04+0.008 | 0.05+0.008 | 15 | 10Ω | S/C |
| 200mV | 1-2kHz | 0.03+0.02 | 0.07+0.05 | 0.08+0.05 | 0.1+0.05 | | 10Ω | S/C |
| 2V | 2-20kHz | 0.05+0.03 | 0.35+0.1 | 0.4+0.1 | 0.5+0.1 | | 0.1Ω | 100mA |
| 20V | | | | | | | 0.1Ω | 100mA |
| 200V | 40-450Hz | 0.02+0.005 | 0.045+0.01 | 0.05+0.01 | 0.06+0.01 | 15 | 10Ω | 10mA |
| 1kV | | | | | | | | |

Note : Frequency Accuracy ± 0.01%, T/C 20ppm/°C, Resolution 5Hz, range 15Hz to 20kHz. Drive Current shown as peak values. All A.C specifications ± 30uV.

D.C. CURRENT

| RANGE | 24 HOUR STABILITY | 90 DAY | ACCURACY 180 DAY | 1 YEAR | T.C. ppm/°C | OUTPUT RESISTANCE | DRIVE CURRENT | RESOLUTION |
|-------|-------------------|-------------|------------------|------------|-------------|-------------------|---------------|------------|
| 200uA | 30+10 | 50+30 | 70+30 | 100+30 | 10 | 10GΩ | 15V | 200pA |
| 2mA | 25+10 | 50+30 | 70+30 | 100+30 | 10 | 1GΩ | 15V | 2nA |
| 20mA | 20+10 | 50+30 | 70+30 | 100+30 | 10 | 100MΩ | 15V | 20nA |
| 200mA | 20+10 | 50+30 | 70+30 | 100+30 | 10 | 10MΩ | 15V | 200nA |
| 2A | 50+20 | 100+60 | 140+60 | 200+60 | 15 | 1MΩ | 5V | 2uA |
| 10A | 0.03%+0.02% | 0.07%+0.03% | 0.08%+0.03% | 0.1%+0.03% | 30 | 100kΩ | 1.2V | 20uA |

Note : All specifications ± 30nA.

A.C. CURRENT (20Hz to 1kHz Sine Wave)

| RANGE | 24 HOUR STABILITY | 90 DAY | ACCURACY % 180 DAY | 1 YEAR | T.C. ppm/°C | OUTPUT RESISTANCE | DRIVE CURRENT | RESOLUTION |
|-------|-------------------|-----------|--------------------|-----------|-------------|-------------------|---------------|------------|
| 200uA | 0.01+0.008 | 0.04+0.01 | 0.045+0.01 | 0.05+0.01 | 20 | 10GΩ | 15V | 200pA |
| 2mA | 0.01+0.008 | 0.04+0.01 | 0.045+0.01 | 0.05+0.01 | 20 | 1GΩ | 15V | 2nA |
| 20mA | 0.01+0.008 | 0.04+0.01 | 0.045+0.01 | 0.05+0.01 | 20 | 100MΩ | 15V | 20nA |
| 200mA | 0.01+0.008 | 0.04+0.01 | 0.045+0.01 | 0.05+0.01 | 20 | 10MΩ | 15V | 200nA |
| 2A | 0.02+0.008 | 0.05+0.01 | 0.06+0.01 | 0.07+0.01 | 30 | 1MΩ | 5V | 2uA |
| 10A | 0.04+0.02 | 0.07+0.03 | 0.08+0.03 | 0.10+0.03 | 50 | 100kΩ | 1.2V | 20uA |

Note : All specifications ± 50nA. 2 & 10 Amp specifications to 500Hz.

RESISTANCE

| VALUE OHMS | 24 HOUR STABILITY | 90 DAY | ACCURACY 180 DAY | 1 YEAR | T.C. ppm/°C |
|------------|-------------------|--------|------------------|--------|-------------|
| 10 | 200 | 700 | 750 | 800 | 10 |
| 100 | 25 | 50 | 60 | 70 | 5 |
| 1k | 10 | 25 | 40 | 50 | 5 |
| 10k | 6 | 25 | 40 | 50 | 5 |
| 100k | 6 | 25 | 40 | 50 | 5 |
| 1M | 15 | 60 | 70 | 80 | 5 |
| 10M | 60 | 200 | 250 | 300 | 10 |

Notes :

A.C. Specifications include the effects of noise and distortion in the 10Hz to 20kHz frequency range.

4% over-range available on all ranges.

Voltage and current limits are stated as Peak Values.

General Information

Power: 110V/120V/220V/240V A.C. (± 5%) 50/60 Hz.
Dimensions / Weight 515 x 170 x 315 mm / 15kg

Ordering Information

| Description | Order Code |
|--|------------|
| 30ppm Programmable Multi-Function Calibrator | 9822 |
| NAMAS Calibration Certificate | 9126 |
| NPL Traceable Calibration Certificate | 1098 |