

## 9823 Programmable Multi-Function Calibrator

- 0 – 1kV AC/DC Voltage
- 0 – 10A AC/DC Current
- 10Ω – 10MΩ Resistance
- 10 ppm / Year accuracy
- GPIB interface
- EasyCal 4 Software



### Introduction

#### 10ppm/Year Accuracy

The outstanding accuracy and stability of the 9823 is achieved by the use of two carefully selected and aged zeners, averaged to produce a stable master reference.

The zeners are selected by computer from a burn-in rig where they are temperature cycled and monitored for 5 months to find the optimum operating current for stability and temperature coefficient. The reference is scaled to the selected output voltage by matched sets of precision hermetically sealed resistors, with tracking and temperature coefficient to better than 0.1 ppm/°C.

#### Deviation and Offset

Digital deviation allows the output to be changed by up to 10% in 1 ppm steps. Errors can then be read off the display directly as a percentage. Offset store enables linearity checking of meters with offset zeros without calculations

#### High Voltage Operation

Output voltages greater than 40 volts can only be selected after pressing a safety interlock key. Once selected there is a programmed 3 second delay, an audible warning bleep and a continuous flashing warning light on the front panel.

#### Front Panel Recalibration

Recalibration from the front panel or over the GPIB bus ensures fast, accurate recalibration of the 9823. Calibration can be performed in less than 20 minutes, without the thermal errors created by removing covers. Calibration constants are held in non-volatile memory. A simple 'cal key' provides calibration security.

#### GPIB Interface as Standard

The GPIB interface allows the 9823 to be connected to a PC. The simple high level programming language gives full control over the 9823 enabling repetitive calibration work to be greatly speeded up. The PC requires an optionally available GPIB interface card.

#### Self-Test and Error Detection

The 9823 software constantly monitors the output and displays error messages on detection of a fault or overload condition. A self-test program can also be run to check that key internal functions are operating correctly and help with fault diagnosis.

#### 1999999 full scale with 4% over-range

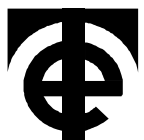
For accurate calibration of DMM'S the ranges of the 9823 have been designed to match the full scales of most digital multimeters.

#### Six Wave Forms from 15 Hz to 20 kHz

The waveforms provided extend the capability of the 9823 to checking 'RMS' performance of multimeters, linearity of chart recorders, and amplitude checked on oscilloscopes.

#### EasyCal software - ISO 9000 compatible

A suite of programs available from Time Electronics. Automatic calibration using a standard PC and the 9823 is possible and printed certificates to ISO 9000 standard are produced. A wide range of electrical and electronic equipment can be calibrated with full details of each being stored on the PC. Inventory management is also possible so that instruments/equipment can be recalled at predetermined intervals. Calibration job control is also provided.



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# Specifications

The accuracy specifications given below apply for a period of 1 year at a temperature of 20°C ± 1°C, after a minimum warmup period of 3 Hours 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	4+2	5+2	7+2	10+2	4	10Ω	S/C	20nV
200mV	3+2	5+2	7+2	10+2	3	10Ω	S/C	200nV
2V	1+1	5+2	7+2	10+2	2	0.1Ω	100mA	2uV
20V	1+1	5+2	7+2	10+2	2	0.1Ω	100mA	20uV
200V	10+10	20+10	25+10	30+10	4	10Ω	10mA	200uV
1kV	10+10	20+15	25+15	30+15	4	10Ω	10mA	2mV

Note : All specification ± 3uV. Nose : 20mV to 20V ranges = 0.3ppm 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	0.008-0.005	0.03+0.008	0.025+0.005	0.03+0.005	15	10Ω	SC
200mV	1-2kHz	0.02+0.02	0.07+0.05	0.06+0.02	0.08+0.02		10Ω	SC
2V	2-20kHz	0.05+0.03	0.35+0.1	0.35+0.05	0.4+0.05		0.1Ω	100mA
20V							0.1Ω	100mA
200V	40-450Hz	0.02+0.005	0.035+0.01	0.04+0.01	0.05+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. specification ± 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	10+5	30+10	40+10	50+10	8	10GΩ	15V	200pA
2mA	10+5	30+10	40+10	50+10	8	1GΩ	15V	2nA
20mA	10+5	30+10	40+10	50+10	8	100MΩ	15V	20nA
200mA	10+5	30+10	40+10	50+10	8	10MΩ	15V	200nA
2A	25+20	60+30	70+30	100+30	15	1MΩ	5V	2uA
10A	0.02%+0.02%	0.04%+0.03%	0.06%+0.03%	0.07%+0.03%	30	100kΩ	1.2V	20uA

Note : All specifications ± 30nA

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

	24 HOUR	ACCURACY %			T.C.	OUTPUT	DRIVE	
200uA	0.01+0.003	0.03+0.01	0.035+0.01	0.04+0.01	20	10GΩ	15V	200pA
2mA	0.01+0.003	0.03+0.01	0.035+0.01	0.04+0.01	20	1GΩ	15V	2nA
20mA	0.01+0.003	0.03+0.01	0.035+0.01	0.04+0.01	20	100MΩ	15V	20nA
200mA	0.01+0.005	0.03+0.01	0.035+0.01	0.04+0.01	20	10MΩ	15V	200nA
2A	0.02+0.005	0.035+0.01	0.04+0.01	0.05+0.01	30	1MΩ	5V	2uA
10A	0.04+0.02	0.07+0.03	0.08+0.03	0.10+0.03	50	1MΩ	1.2V	20uA

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

## RESISTANCE

VALUE	24 HOUR	ACCURACY			T.C.
10	10	20	40	50	5
100	8	10	17	20	4
1k	3	8	15	20	3
10k	2	8	15	20	3
100k	2	8	15	25	3
1M	8	20	40	60	3
10M	20	50	80	100	5

Notes :

A.C. Specifications include the effects of nose 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
10ppm Programmable Multi-Function Calibrator	<b>9823</b>
NAMAS Calibration Certificate	<b>9127</b>
N.P.L. Traceable Calibration Certificate	<b>1059</b>