



5045 Oscilloscope Calibrator

Time Electronics

Calibration, Test & Measurement

- 1mV – 220V Square Wave/DC
- Frequency 0.1 – 100MHz
- Time Markers 15s to 10ns
- Fast Rise <300ps
- Front Panel Control
- PC Virtual Control
- External reference input
- 2 GHz Sweep Option
- Rubidium Option
- Current Probe Adaptor
- RS232/USB/GPIB



EasyCal
Software Compatible

The **5045** is a versatile, high accuracy calibrator capable of calibrating a wide range of oscilloscopes and timer/counters. It provides a wide range of outputs for amplitude, frequency, period and bandwidth. Amplitude calibration is achieved by a DC signal or 1kHz square-wave, ranging from 1mV to 220V (2V max for 50 ohm loads). Deviation up to $\pm 9.99\%$ allows fine adjustment of amplitude and direct read-out of error. Accurate frequencies are generated from a temperature controlled quartz crystal oscillator. Alternatively a 10MHz reference input can be used. Timing accuracy of 0.1ppm is suitable for most oscilloscopes and timer counters. A precise square-wave output provides a fast rise time of less than 300ps, which allows bandwidth testing up to 600MHz.

Simple Operation

Functions and ranges are easily accessed from the front panel. Increase and decrease keys per digit, are used to quickly set the output value. Deviation control then enables the user to finely adjust the output value as a percentage ($\pm 9.99\%$). All this information is shown on a clear, easy to read LED display.

Virtual Front Panel Software

The 5045 comes with Time Electronics' windows based 'Virtual Front Panel' interface that enables the user to control the unit via a laptop or PC.



2 GHz Levelled sine-wave option

For precise bandwidth determination and frequency response analysis the 2 GHz option is available. The ability to sweep the frequency output from 100MHz to 2 GHz and adjust the amplitude to 0.5V, 1.0V and 1.5V pk-pk ensures accurate analysis of oscilloscope input amplifiers.

Current probe calibration

For calibration of oscilloscope current probes an external adaptor is available. This converts the 5045's amplitude output to current and covers the range 0.1mA to 100mA pk-pk, 0.2% accuracy, DC or 1kHz.

Rubidium frequency reference

Enhanced timing performance is available by specifying the rubidium frequency reference option (9762). This option achieves timing accuracies required to calibrate high performance Timer/Counters to 1 part in 10^{10} .

Calibration made easy

To automate the oscilloscope calibration process the 5045 can be controlled using Time Electronics' EasyCal calibration software. This reduces calibration times, ensures consistent results and produces certificates to international quality standards.

5045 Technical Specifications

(Specifications are for 1 year and apply between 18°C and 26°C)

Function	Range	Specification (\pm output + floor)	Resolution
Frequency*	0.1Hz to 10MHz 20MHz to 100MHz	\pm 0.1ppm \pm 20ppm	Fixed Outputs in 1,2,5,10 Sequenced Steps
Period*	10s to 100ns 50ns to 10ns	\pm 0.1ppm + 30ps \pm 20ppm + 50ps	
Duty Cycle	100Hz, 1kHz, 10kHz.	Settable from 0 to 100%	
Amplitude DC or 1kHz Square wave	1mV to 200mV 200mV to 20V 20V to 220V 1mV to 200mV (50 Ω) 200mV to 2V (50 Ω)	\pm 0.2% + 10uV \pm 0.05% + 10uV \pm 0.05% + 10uV \pm 0.25% + 15uV \pm 0.25% + 15uV	10uV 1mV 10mV 100uV 1mV
Fast Rise	10MHz	Rise Time less than 300ps	

*Frequency amplitude: 1.5V pk-pk 0.1Hz to 100KHz. 1V pk-pk 200kHz to 100MHz.

Options

	Range	Specification	
2 GHz Sweep	100MHz to 200MHz 200MHz to 500MHz 500MHz to 1GHz 1GHz to 2GHz	1% 4% 10% 20%	Levelled sine-wave. Settable amplitudes: 0.5V, 1V, 1.5V pk-pk (Frequency Accuracy 20ppm)
Rubidium reference	Rubidium atomic clock 10MHz frequency reference. Increases accuracy to 1 part in 10 ¹⁰ . (Applies to 10MHz Max output on 5045)		
Current probe adapter	Battery powered external adapter for checking current probes. 0.1 - 100mA, 0.2% accuracy.		

General Specification

Warm up	1 Hour to full accuracy
Settling Time	Less than 5 seconds
Standard Interfaces	GPIB (IEEE-488), RS-232, USB
Operation Environment	Temperature: Operating: 15 - 25 °C, Full Spec: 22 °C +/- 3°C, Storage: -10 °C to 50 °C Humidity: Operating < 80% non condensing. Altitude 0 - 3km. Non Operating 3Km - 12km
Line Power	100 - 230V AC 50/60 Hz. Power Consumption 60W typical, 80W Max.
Dimensions	W 450 x D 272 x H 152 mm (18x11x7").
Weight	8.2Kg (18lbs)

Ordering Information

Code	Description
5045	Oscilloscope/Timer Calibrator
9769	Programmable 2 GHz Levelled Sine Generator
9762	Rubidium Frequency Reference
9764	Current Probe Calibration Adaptor
9747	EasyCal Calibration Software
9728	19" Universal Rack Mount Kit
9147	Factory (NPL Traceable) Calibration Certificate
9128	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