

# 5045 Oscilloscope Calibrator



- 1mV to 220V Square Wave/DC
- Frequency 0.1 to 100MHz
- Time Markers 10s to 10ns
- Fast Rise <300ps
- Front Panel or PC Virtual Control
- External reference input
- 2.2GHz Sweep Option
- Rubidium Frequency Reference Option
- Current Probe Adaptor
- RS-232/USB/GPIB Interface

## QUICK AND EASY OSCILLOSCOPE CALIBRATION TO 600MHZ

The 5045 is a versatile, high accuracy calibrator capable of calibrating digital and analogue oscilloscopes, timer/counters, and frequency meters. 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 in 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 CONTROL SOFTWARE

The 5045 is supplied as standard with Time Electronics' windows based Virtual Control interface software. This enables the user to control the instrument via a laptop or PC.

## 2.2GHz LEVELLED SINE-WAVE OPTION

For precise bandwidth determination and frequency response analysis the 2.2GHz option is available. The ability to sweep the frequency output from 50MHz to 2.2GHz and adjust the amplitude from 0.5V to 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.

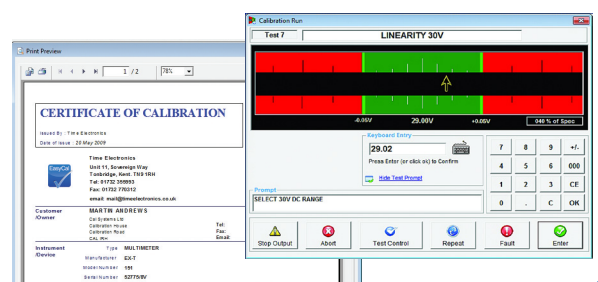
## RUBIDIUM FREQUENCY REFERENCE

Enhanced timing performance is available by specifying the rubidium high stability 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 provides increased speed of calibration and consistency of results.

Easily produce calibration certificates and reports to ISO 9001, ISO 17025, and other international quality standards.



# 5045 Specifications

## TECHNICAL SPECIFICATIONS

(Specifications are for 1 year and apply between 18°C and 28°C)

### STANDARD FEATURES

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	2mV to 200mV 200mV to 20V 20V to 220V 1mV to 200mV (50 $\Omega$ ) 200mV to 2V (50 $\Omega$ )	$\pm$ 0.2% + 10 $\mu$ V $\pm$ 0.05% + 10 $\mu$ V $\pm$ 0.05% + 10 $\mu$ V $\pm$ 0.25% + 15 $\mu$ V $\pm$ 0.25% + 15 $\mu$ V	10 $\mu$ V 1mV 10mV 100 $\mu$ V 1mV
Fast Rise	10MHz	Rise Time less than 300ps (>400mV pk-pk into 50 $\Omega$ )	

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

### OPTIONS

Option	Range	Specification	
2.2GHz Levelled Sine-Wave	50MHz to 199.9MHz*	1%	Settable amplitudes: 0.5V, 1V, 1.5V pk-pk 50 $\Omega$ Output
	200MHz to 499.9MHz* 500MHz to 999.9MHz 1GHz to 2.2GHz	2% 4% 6%	
<i>*From 50 to 499.9MHz an additional error of 0.5% of range applies. Frequency accuracy 20ppm.</i>			
Rubidium reference	Rubidium atomic clock 10MHz frequency reference. Increases accuracy to 1 part in 10 <sup>10</sup> . (Applies to 10MHz Max output on 5045)		
Current probe adaptor	Battery powered external adaptor for checking current probes. 0.1 to 100mA, 0.2% accuracy.		

### GENERAL SPECIFICATIONS

Warm up.....	30 minutes to full accuracy
Settling Time .....	Less than 5 seconds
Standard Interfaces.....	GPIB (IEEE-488), RS-232, USB
Temperature Performance .....	Operating: 10 to 40°C, Full Spec: 23°C +/- 5°C, Storage: -10°C to 50°C
Operating Humidity/Altitude .....	< 80% non-condensing / Altitude: 0 to 3km. Non operating: 3km to 12km
Line Power .....	100 to 230V AC 50/60Hz. Power Consumption 60W typical, 80W Max.
Dimensions .....	W450 x D272 x H152mm (18 x 11 x 7").
Weight .....	8.2kg (18lbs)
Supplied With.....	Virtual control software, user manual, RS-232 cable, USB adaptor/cable

### ORDERING INFORMATION

5045 .....	Oscilloscope and Timer / Counter Calibrator
9769 .....	Scope 2.2GHz Levelled Sine Generator
9762 .....	Rubidium High Stability Frequency Reference
9764 .....	Current Probe Calibration Adaptor
9519 .....	Test Lead and Adaptors Set
9728 .....	19" Universal Rack Mount Kit
ECFLA .....	EasyCal Calibration Software (see separate datasheet for details and accompanying options)
C147 .....	Factory Calibration Certificate (NPL traceable)
C128 .....	UKAS Calibration Certificate (ISO 17025)
EW03 .....	Extended Warranty - 3 years covering parts and labour

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