



5025 Calibrator/DMM/EasyCal Package

Time Electronics

Calibration, Test & Measurement

- 0 - 1050 V AC/DC voltage
- 0 - 22 A AC/DC current
- 0 - 1GΩ resistance
- Thermocouple simulation
- Digital Frequency
- PT100 simulation
- Clamp Meter Calibration
- GPIB, RS232 & USB Interface
- Calibrate up to 4.5 digit DMM's



5025 Multifunction Calibrator + 5065 6.5 Digit Bench Multimeter + EasyCal Calibration Software + 9780 Clamp Meter Adaptor + 9541 5 Piece Test Lead Set + 9765 USB Interface for 5025 + 9778 Calibration & ID Label Printer + Factory (NPL) Calibration Certificates for 5025 and 5065.

Time Electronics have released a Multifunction Calibrator/DMM/Software package for the cost effective solution to multi-instrument calibration. In-house calibration has become affordable and easy to implement, with benefits of cutting costs and improving efficiency. This comprehensive package enables companies to get started immediately.

The 5025 can calibrate, bench and handheld multi-meters, frequency meters, ohm meters, ac/dc millivoltmeters, thermocouple indicators, clamp meters, temperature indicators, timer counters, oscilloscopes and many other measurement devices.

The standard 5025 is fitted with AC/DC voltage to 1050kV, AC/DC current to 22A, digital frequency to 10MHz, decade resistance to 1G ohms, and thermocouple simulation. Optional extras include; capacitance and inductance, full range resistance (incorporating PT100 simulation), power calibration and oscilloscope calibration.



The 5065 DMM is a versatile, highly accurate, 6 ½ digit multimeter measuring AC/DC voltage and current, resistance, thermocouples, RTDs, frequency and period.

In addition to standard functions many other capabilities such as Min/Max, Ratio/% and Null are included. Memory functions with up to 2000 readings can be stored and recalled. Limit testing with an external output can be configured to signal pass or fail.

Both the 5025 and 5065 integrate with EasyCal to automate the calibration process. Increase speed of calibration and consistency of results, and produce calibration certificates and reports.



Also included is a clamp meter adaptor, test lead set, USB interface (5025), Cal & ID label printer, and factory (NPL traceable) calibration certificates for the 5025 and 5065. Further options can be added as required.

5025 Technical Specifications

Voltage DC	Range: Best 1 Year Specification:	0 to \pm 1050V \pm 15ppm of setting
Current DC	Range: Best 1 Year Specification:	0 to \pm 22A. 1100A with Clamp Meter Adaptor \pm 80ppm of setting
Voltage AC	Range: Best 1 Year Specification:	1mV to 1050V (10Hz to 20kHz, Sine-wave) \pm 300ppm of setting
Current AC	Range: Best 1 Year Specification:	10uA to 22A (20Hz to 1kHz, Sine-wave) 100A AC with CT. 1100A with Clamp Meter Adaptor \pm 0.05% of setting
Resistance	Range: Best 1 Year Specification:	0 to 1G ohms (Fixed Values, decade steps) \pm 20ppm of setting
Conductance	Range: Best 1 Year Specification:	1 S to 1n S (Fixed Values, decade steps) \pm 20ppm of setting
Thermocouple Simulation	Range: Best 1 Year Specification:	-270 to 1800°C (Type J,K,R,T,S,B,E,N) \pm 0.3 °C
10MHz Digital Frequency/Period	Range: Best 1 Year Specification:	0.1Hz to 10MHz / 100nS to 10S \pm 20ppm of setting

Options

Hi Frequency AC V	Range/Max Freq: Best 1 Year Specification:	20 to 200mV/300kHz. 0.2 to 2V/1MHz. 2 to 20V/100kHz 0.05% + 0.1mV
Capacitance	Values: Best 1 Year Specification:	1nF, 10nF, 100nF, 1uF, 10uF & 100uF (100V Max) \pm 0.25%
Inductance	Values: Best 1 Year Specification:	1, 1.9, 5, 10, 19, 50, 100, 190, 500mH - 1H & 10H \pm 0.1%
Full Range Resistance	Range: Best 1 Year Specification:	1 ohm to 120M ohms (Variable) \pm 0.01% of setting
PT100	Range: Best 1 Year Specification:	-200 to 850°C \pm 0.1°C
Power Calibration	Range: Best 1 Year Specification:	22A, 1050V. Phase \pm 90° 100A AC with CT. 1100A with Clamp Meter Adaptor ACV: 0.03%, DCV: 0.01%. ACI: 0.1%, ACV: 0.03% Phase: 0.3°
Oscilloscope Frequency/Period	Range: Best 1 Year Specification:	0.1Hz to 100MHz / 100ns to 10s \pm 0.1ppm of setting
Oscilloscope Duty Cycle	Values:	3 frequencies, 100Hz, 1kHz, 10kHz. Settable from 0 to 100%
Oscilloscope Amplitude	Range: Best 1 Year Specification:	0mV to 200V & 0mV to 2V 50 ohms (Square-wave) \pm 0.05%
Oscilloscope Fast-Rise	Values:	< 300ps. Bandwidth Checking up to 600 MHz
2.2 GHz Sweep	Range: Best 1 Year Specification:	100MHz - 2.2GHz levelled sine-wave (0.5, 1, 1.5V pk-pk). Amplitude \pm 1%, Frequency \pm 20ppm.

General Specification

Warm up	1 Hour to full accuracy
Settling Time	Less than 5 seconds
Standard Interfaces	GPIO (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 200W max
Dimensions	W 430mm, D 480mm, H 155mm, (17x18x6") 16.5Kg (36.4lbs)

5065 Technical Specifications

Specifications are for 1 year \pm (% of reading + % of range) (23 °C \pm 5 °C)

DC Voltage			
Range	Resolution	Input Resistance	Accuracy
100.0000 mV	0.1 μ V	$> 10G\Omega$	0.0050 + 0.0035
1.000000 V	1.0 μ V	$> 10G\Omega$	0.0040 + 0.0007
10.00000 V	10 μ V	$> 10G\Omega$	0.0035 + 0.0005
100.0000 V	100 μ V	10M Ω	0.0045 + 0.0006
1000.000 V	1 μ V	10M Ω	0.0045 + 0.0010
DC Current			
Range	Resolution	Shunt Resistance	Accuracy
10.000000mA	10nA	5.1 Ω	0.05 + 0.02
100.00000mA	100nA	5.1 Ω	0.05 + 0.005
1.000000A	1 μ A	0.1 Ω	0.1 + 0.01
3.00000A	10 μ A	0.1 Ω	0.12 + 0.02
Resistance			
Range	Resolution	Test Current	Accuracy
100.0000 Ω	100 $\mu\Omega$	1mA	0.01 + 0.004
1.000000 K Ω	1m Ω	1mA	0.01 + 0.001
10.00000 K Ω	10m Ω	100 μ A	0.01 + 0.001
100.0000 K Ω	100m Ω	10 μ A	0.01 + 0.001
1.000000 M Ω	1 Ω	5 μ A	0.01 + 0.001
10.00000 M Ω	10 Ω	500nA	0.04 + 0.001
100.0000 M Ω	100 Ω	500nA	0.8 + 0.01
Diode Test			
1.0000V	10 μ V	1mA	0.01 + 0.02
Continuity			
1000.00K Ω	10m Ω	1mA	0.01 + 0.03
AC Voltage			
Range	Resolution	Frequency (Hz)	Accuracy
100.0000mV	0.1 μ V	3-5	1.00 + 0.04
		5-10	0.35 + 0.04
		10-20K	0.06 + 0.04
		20-50K	0.12 + 0.05
		50K – 100K	0.60 + 0.08
		100K – 300K	4.00 + 0.50
1.000000V to 750.000V	1.0 μ V To 1mV	3-5	1.00 + 0.03
		5-10	0.35 + 0.03
		10-20K	0.06 + 0.03
		20-50K	0.12 + 0.05
		50K – 100K	0.60 + 0.08
		100K – 300K	4.00 + 0.50
AC Current			
Range	Resolution	Frequency (Hz)	Accuracy
1.000000A	1 μ A	3-5	1.00 + 0.04
		5-10	0.30 + 0.04
		10-5K	0.10 + 0.04
3.000000	10 μ A	3-5	1.10 + 0.06
		5-10	0.35 + 0.06
		10-5K	0.15 + 0.06
Frequency and Period			
Range	Frequency (Hz)	Accuracy (% of reading)	
100mV to 750V	3-5	0.1	
	5-10	0.05	
	10-40	0.03	
	40-300K	0.06	

RTD Types: PT100,D100, F100, PT385 or PT3916. (Best Acc. \pm 0.08°C)

Thermocouple Types: J,K & T(Acc. \pm 0.5°C). E(Acc. \pm 0.6°C).R,S & B(Acc. \pm 5°C)

General Specification

Dimensions: 85(H) x 210(W) x 350(D)mm
 Weight: 4.36kg

EasyCal Features

Networking:	For multi-station and site calibration work
Licensing:	Portable, only required for calibration runs
Instrument Control:	Control and communicate with any RS232/USB/GPIB instrument
TE Instrument Support:	Time 5025, 5051, 5075. 5018, 5011 and more
GPIB Support:	NI, Agilent, Measurement Computing, CEC
Security:	Secure User Log In and Digital Signatures
Crystal Reports:	Edit certificate and report templates. Create custom reports
Uncertainty Management:	Create uncertainty tables for Laboratory and Site
Built –in PDF engine:	Produce PDF certificates and reports without 3 rd party software
Data export:	To CSV and HTML formats.

EasyCal Overview

Instruments, Customers, and Jobs

A comprehensive database of instruments and customers (or owner) allows the operator to access any information required. By clicking the search button on the toolbar it is possible to enter specific criteria to quickly find the instrument or customer. When adding details the user is aided by comprehensive drop-down lists, which automatically update when a new detail is added. When an instrument is booked in the job process starts. Specific information about the job is entered; such as 'service required', 'service by' and 'accessories supplied'. A job sheet and label can be produced at this stage to accompany the instrument. As the job is put through the system these parameters can be updated for example 'quote price', 'job status' and 'invoiced'.

Instrument Recall and Reminder System

Instruments which are due for calibration are listed on screen. From here reminder letters and lists can be printed or emailed directly to the customer or department.

Calibrating Instruments, Standards and Uncertainties

Traceability information on calibrating instruments and standards is stored and maintained by EasyCal. Uncertainty tables for laboratory and site can be created for each calibrating instrument. These are then automatically processed and applied to certificates.

Procedure Writing and Editing

Creating and editing test procedures is made simple with intuitive, user-friendly windows. Editing test information can be done by replacing, adding, or copy/pasting. EasyCal keeps track of each time a procedure is edited.

Standard Procedures

A standard calibration library comprising of over 1000 procedures covering a wide variety of instruments is included as standard. Procedure templates for multi-meters, clamp meters, decade boxes, insulation testers, and more can be used for creating any new procedures as required.

Conversion Tables

Conversion tables for thermocouples and RTDs are included; alternatively user-defined tables can be created.

RS232 / GPIB Commands

For more complex instrument control GPIB / RS232 commands can be sent on a test-by-test basis or run as a script.

Procedure Reports

Procedure reports are available for approval and signing off.

Procedure Simulation

To help with the development of procedures a test can be edited while a calibration run is being performed. Also the Calibration Run Simulator means a procedure can be tested without the need for controlling an instrument.

Instrument Calibration

Selection of the instrument under test is quick and easy. With the use of a barcode scanner this selection becomes automatic.

Calibration Prompts

Picture prompts are shown to aid the user with instrument range selection and connection.

Test Control

At any stage during the calibration run a summary of the results for the tests completed is displayed. The operator is able to move forward or backward through the procedure as required. A summary printout is also available from Test Control.

Graphical Test Screen

The calibration run is made simple and efficient by a graphical user-interface, which increases speed of data entry. Instruments, which cannot be automatically calibrated, can still have the results data entered manually. The entered value is compared with the required value as specified in the procedure.

End of Calibration Run

At the end of a calibration run the operator has the option to print a certificate and label. The ability to edit service information is also presented to the operator.

Calibration Test Forms

Alternatively 'calibration test forms' for hand written results are available. This data is then entered into EasyCal at a later date.

Certificates

Produce Calibration Certificates & labels on demand. The user can keep a record of instrument history and servicing. Simple search facilities help find the required certificate.

Customise Certificates

Using Crystal Reports (optional) certificates formats can be easily customised, or design a new certificate layout.

Import and Export Results

Data can be exchanged from one system to another user via the import and export features. Certificate data can be converted in spreadsheet, CSV and HTML formats.

9780 Technical Specifications

The 9780 is a precision adaptor for use with calibrated AC or DC sources and allows accurate calibration of a wide range of clamp meters.

Two current loops are provided; a 1 to 1 ratio and the high range a 50 to 1 ratio.

The maximum allowed primary current is 22A RMS. The frequency range is 45—90 Hz.

The series resistance of the 50 turn coil is approximately 0.11Ω and the inductance is 1mH. The resistance of the 1 turn coil is approximately 1mΩ.

The 9780 is rated for continuous operation at 10amps. At 22 amps the duty cycle should be a maximum of 3 minutes on and 6 minutes off.

When used with older style clamp meters where substantial operating power is required it should be noted that additional power will be required from the current source. For example a 1000amp Ferranti clamp on ammeter will require at least 50% more power from the current source.

This will require increased power transfer through the clamp meter adaptor and therefore the on to off time should be increased to 1 to 10 ie 1 minute on and 10 minutes off.

**SPEC 0 TO 22 AMPS
TRANSFER RATIO 50 TO 1 OR 1 TO 1**

Calibrator	O/P Frequency	Amp Turns	Accuracy (% of O/P)	plus Floor (Amps)
0.2A to 2.2A	DC	10 - 110	0.5	0.05
2.2A to 22A	DC	110 - 1100	0.5	0.15
0.2A to 2.2A	45-65 Hz	10 - 110	0.5	0.2
0.2A to 2.2A	65-90 Hz	10 - 110	1	0.25
2.2A to 22A	45-65 Hz	110 - 1100	0.5	0.7
2.2A to 22A	65-90 Hz	110 - 1100	1	0.9

The coils are rated for continuous use at 10A.
At 22A the duty cycle is 3 mins on and 6 mins off.

Max drive voltage is 3Vdc or 3V rms ac.

The above specification applies for use with general purpose clamp meters such as the Fluke 801-1000 or LEM LH1020.

General Specification

Dimensions: 240W X 280D X 85H mm

Weight: 3.9Kg

Ordering Information (<i>*included in package</i>)	Code
<i>*Multifunction Calibrator</i>	5025
Options	
Capacitance (1000pF- 100uF) / Inductance (1mH - 10H)	9798
Simulated Resistance (10 ohm - 40 Mohm)	9774
Full Range Resistance (1 ohm - 120 Mohm)	9787
High Frequency AC Voltage (1MHz Max. 20mV - 20V)	9771
Scope Calibration (1mV to 200V, 0.1Hz - 100 MHz, < 1nS risetime)	9770
Scope 2.2GHz Levelled Sine Generator (Internal)	9769
Rubidium High Stability Frequency Reference (External - scope options only)	9762
Oven-Controlled High Stability Frequency Reference (Internal - scope options only)	9783
External Low Noise Attenuator 1000:1	9766
External Low Noise Attenuator 100:1	9767
Power Calibration (0 - 20KW AC and DC)	9797
<i>*Clamp Meter Adaptor (1 and 50 turn coils)</i>	9780
Optical Tacho Adaptor	9773
100 Amp AC Current Transformer	9790
Power Amplifier	9760
5025 Carry Muff	9085
5025 Rack mount kit	9728
<i>*Standard Test Lead Set</i>	9541
<i>*5025 Factory (NPL Traceable) Calibration Certificate</i>	9159
5025 UKAS Calibration Certificate (ISO 17025)	9103
5025 Extended Certificate (UKAS - ISO 17025)	9113
<i>*6.5 digit benchtop multimeter</i>	5065
10 Channel Scanner Card for 5065	9714
GPIB Interface for 5065	9715
RS232 Interface for 5065	9716
RTD Probe Adaptor for 5065	9717
<i>*5065 Factory (NPL Traceable) Calibration Certificate</i>	9173
5065 UKAS Calibration Certificate (ISO 17025)	9117
<i>*EasyCal Software</i>	9747
EasyCal - Additional Users	9736
Bar Code Reader	9777
<i>*Cal and ID Label Printer</i>	9778
Job Card and Address Label Printer	9779
GPIB Interface Card (PCI)	9743
USB-GPIB adaptor	9794
GPIB cable	9597
RS232 Cable	9588
<i>*USB Interface for control of 5025</i>	9765