

SIGNAL CALIBRATORS

UniCal Series



General

UniCal mA, Tc, and Rtd are designed to meet the needs of instrumentation and Quality engineers both for laboratory and field applications. Measuring and simulation ranges are the most used checking and calibrating process instrumentation. UniCal is accurate, rugged and easy to use. Five operational modes can be selected: Generator, Simulator, Indicator, Indicator on powered circuits, 24 Vdc Current loop power supply.

Report of Calibration

Each instrument is factory calibrated and certified by comparison with Eurotron Standards. Our laboratory equipments are periodically certified by an Internationally Accredited Laboratory to ensure instrument traceability. UniCal are supplied with a Report of calibration stating nominal and actual values and deviation errors. UniCal represents the tool to keep your test and process equipment adequately calibrated for ISO 9000 compliance.

Self Calibration

Hardware and software design allows automatic calibration of UniCal. Calibration procedure is protected by a security code.

Scale Factor

Easy menu driven set-up to read or simulate electrical signal values in terms of technical units (e.g. Bar, CO%, etc.).

Square Root

Square root can be programmed during the set-up procedure (linear ranges only) to have direct readings of flow from a ΔP transmitter signal. Display limits are 0 and +2500.

Technical Unit Mode %

The instrument converts directly the voltage or the current signal into % or vice versa, with the following linear relations:

0	+4	+12	+20	(mA)
-25	0	50	100	(%)
	0	+50	+100	(mV)
	0	+0.5	+1	(V)
	+1	+3	+5	(V)
	0	+5	+10	(V)

Simulation Mode

A menu driven set-up allows generation of a single value and storage of three values with manual recall. A manual repeat increment is also possible (<STEP> key).

Digital Interface

A digital port with TTL logic levels is available as standard. An adaptor cable for standard RS232 levels is available on request.

Hand-Held Calibrator for In-Field Maintenance

UniCal mA, UniCal Tc, UniCal Rtd, UniCal MMX3

Features

- Superior Accuracy: up to 0.04%rdg
- Hand Held
- Easy to Use
- Low Cost
- Ready for the Future: RS232, Memory, Ramp & Step

Ordering Code

UniCal mA	cod. 3405	-A-B
UniCal Tc	cod. 3908	-A-B
UniCal Rtd	cod. 3112	-A-B

Each instrument is supplied with soft Vinyl case, report of calibration and instruction manual.

Table A Battery / Charger

0	Alkaline / none
1	Ni-Cd / 115VAC with USA plug
2	Ni-Cd / 230VAC with Schuko plug
3	Ni-Cd / 230VAC with UK plug
4	Ni-Cd / 230VAC with European plug
5	Ni-Cd / 100VAC with USA / Japan plug

Table B Report of Calibration

1	Eurotron certificate
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Accessories

Code	Description
BB530007	TTL / RS232 cable
BB530009	Insulated TTL / RS232 cable
BB260141	CalpMan2000 calibration software

Two UniCal calibrators can be supplied combined into a dedicated ABS case as it follows:

MATC	UniCal mA + UniCal Tc
MARTD	UniCal mA + UniCal Rtd



Specifications

Accuracy: see table.

Accuracy indicated are stated at 90 days for a temperature range +23°C ±2°C. Typical 1 year accuracy can be estimated by multiplying the accuracy % of rdg. value by 1.4. All input ranges have an additional error of ±1 digit.

Common mode rejection: >130 dB @ 50/60 Hz

Normal mode rejection: >60 dB @ 50/60 Hz

Maximum load: 1000Ω @ 20mA UniCal mA only

Serial interface:

TTL levels as standard. RS232 with the optional cable

Display: high contrast dot matrix LCD

Power supply: n.4 type AA alkaline or rechargeable

Scale factor:

zero and span programmable within -10000 and +10000

Square root: programmable within 0 and +2500

Operating temperature: from -5°C to +50°C

Storage temperature: from -20°C to +60°C

Case: ABS

Dimension: 120 x 60 x 230 mm

Weights: nett 450 g - gross 1 kg

UniCal Rtd

International temperature scale:

IPTS68 and ITS90 selectable

Measurement excitation current (IN):

< 400Ω: 0.5mA;

< 4000~1: 0.05mA

Simulation excitation current (OUT):

Up to 400Ω: from 0.3 to 3mA;

UP to 4000Ω: from 0.03 to 0.3mA

Cable compensation: 100Ω max

Overload protection: electronic and fuse up to 60Vac

Temperature stability:

Span. ±0.01 % of reading /°C;

Zero: ±0.2mΩ /°C

UniCal Tc

International temperature scale:

IPTS68 and ITS90 selectable

Reference junction compensation:

Internal: from -5°C to 50°C;

Programmable: from -50°C to 100°C

Rj compensation error: ±0.15°C

Rj compensation drift: ±0.015°C/°C

Temperature stability:

Span ±0.0025% of rdg./°C;

Zero ±0.2mV/°C

Output impedance (emf output):

< 0.5Ω with max current of 0.5mA

Input impedance: > 10MΩ

Source resistance effects: 1μV for 1 000Ω

Max input voltage: 50Vdc

	Total Range	Res.	Accuracy (% of rdg.)	
UniCal mA				
mA	0 to 22	0.01mA	±(0.05%+10μA)	
	4 to 20	0.01mA	±(0.05%+10μA)	
UniCal Rtd				
Pt100	-200 to 850°C	0.1°C	±(0.04%+0.1°C)	IEC751
α=3850	-328 to 1562°F	0.1°F	±(0.04%+0.18°F)	DIN4376
Pt100	-200 to 650°C	0.1°C	±(0.04%+0.1°C)	US
α=3902	-346 to 1202°F	0.1°F	±(0.04%+0.18°F)	
Pt100	-200 to 850°C	0.1°C	±(0.04%+0.1°C)	US Lab
α=3926	-346 to 1562°F	0.1°F	±(0.04%+0.18°F)	
Pt100	-200 to 600°C	0.1°C	±(0.04%+0.2°C)	SAMA
α=3923	-346 to 1112°F	0.1°F	±(0.04%+0.36°F)	
Pt100	-200 to 850°C	0.1°C	±(0.04%+0.2°C)	OIML 1985
α=3910	-328 to 1562°F	0.1°F	±(0.04%+0.36°F)	
Pt100	-200 to 600°C	0.1°C	±(0.04%+0.3°C)	JIS JEMINA
α=3916	-346 to 1112°F	0.1°F	±(0.04%+0.54°F)	1981
Ni100	-60 to 180°C	0.1°C	±(0.04%+0.2°C)	
α=617	-76 to 356°F	0.1°F	±(0.04%+0.36°F)	
Ni120	0 to 150°C	0.1°C	±(0.04%+0.3°C)	
α=672	32 to 302°F	0.1°F	±(0.04%+0.54°F)	
Cu10	-70 to 150°C	1°C	±(0.04%+0.3°C)	
α=42	-94 to 302°F	1°F	±(0.04%+0.54°F)	
Cu100	-180 to 150°C	1°C	±(0.04%+0.1°C)	
α=42	-292 to 302°F	1°F	±(0.04%+0.18°F)	
Pt200	-200 to 760°C	0.1°C	±(0.04%+0.1°C)	IEC751
α=3850	-328 to 1562°F	0.1°F	±(0.04%+0.18°F)	
Pt500	-200 to 850°C	0.1°C	±(0.04%+0.1°C)	IEC751
α=3850	-328 to 1562°F	0.1°F	±(0.04%+0.18°F)	
Pt1000	-200 to 850°C	0.1°C	±(0.04%+0.1°C)	IEC751
α=3850	-328 to 1562°F	0.1°F	±(0.04%+0.18°F)	
Pt100	-200 to 850°C	0.1°C	±(0.04%+0.1°C)	OIML1985
α=3910	-328 to 1562°F	0.1°F	±(0.04%+0.18°F)	
Ω IN	0 to 300Ω	10mΩ	±(0.04%+27mΩ)	
	0 to 400Ω	100mΩ	±(0.04%+27mΩ)	
	20 to 3000Ω	100mΩ	±(0.04%+270mΩ)	
Ω OUT	2 to 300Ω	10mΩ	±(0.04%+35mΩ)	
	2 to 400Ω	100mΩ	±(0.04%+35mΩ)	
	20 to 3000Ω	100mΩ	±(0.04%+350mΩ)	
	20 to 4000Ω	1Ω	±(0.04%+350mΩ)	

	Total Range	Accuracy Range	Res.	Accuracy (% of rdg.)
UniCal Tc				
Tc J	-210 to 120°C	-130 to 1200°C	0.1°C	±(0.04%+0.3°C)
	-346 to 2192°F	-202 to 2192°F	0.1°F	±(0.04%+0.54°F)
Tc K	-270 to 1370°C	-60 to 1300°C	0.1°C	±(0.04%+0.3°C)
	-454 to 2498°F	-76 to 2372°F	0.1°F	±(0.04%+0.54°F)
Tc T	-270 to 400°C	-50 to 400°C	0.1°C	±(0.04%+0.3°C)
	-454 to 752°F	-58 to 752°F	0.1°F	±(0.04%+0.54°F)
Tc R	0 to 1760°C	800 to 1700°C	0.1°C	±(0.04%+0.7°C)
	32 to 3200°F	1472 to 3092°F	0.1°F	±(0.04%+1.26°F)
Tc S	0 to 1760°C	800 to 1760°C	0.1°C	±(0.04%+0.8°C)
	32 to 3200°F	1472 to 3200°F	0.1°F	±(0.04%+1.44°F)
Tc B	200 to 1820°C	1200 to 1820°F	0.1°C	±(0.04%+0.7°C)
	392 to 3308°F	2192 to 3308°F	0.1°F	±(0.04%+1.26°F)
Tc C	0 to 2300°C	0 to 2300°C	0.1°C	±(0.04%+0.1°C)
	32 to 4172°F	32 to 4172°F	0.1°F	±(0.04%+1.8°F)
Tc U	-200 to 400°C	-50 to 400°C	0.1°C	±(0.04%+0.3°C)
	-328 to 752°F	-58 to 752°F	0.1°F	±(0.04%+0.54°F)
Tc L	-200 to 760°C	-130 to 760°C	0.1°C	±(0.04%+0.3°C)
	-328 to 1400°F	-202 to 1400°F	0.1°F	±(0.04%+0.54°F)
Tc N	0 to 1300°C	80 to 1300°C	0.1°C	±(0.04%+0.4°C)
	32 to 2372°F	176 to 2372°F	0.1°F	±(0.04%+0.72°F)
Tc E	-270 to 1000°C	-150 to 1000°C	0.1°C	±(0.04%+0.3°C)
	-454 to 1832°F	-238 to 1832°F	0.1°F	±(0.04%+0.54°F)
Tc F	0 to 1400°C	80 to 1400°C	0.1°C	±(0.04%+0.3°C)
	32 to 2552°F	176 to 2552°F	0.1°F	±(0.04%+0.54°F)
mV	0 to 100mV	0 to 21mV	1μV	±(0.05%+9μV)
		21 to 100mV	1μV	±(0.04%+12μV)



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CalpMan 2004 Calibration Management Software

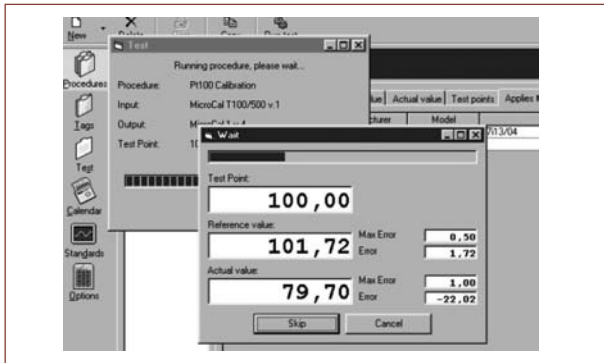
Companies Quality procedures requires documentation procedures, results, traceability and adequacy. **CalpMan 2004** is a powerful, flexible and easy to use automated calibration software for PCs running Microsoft Windows. Calibration procedures can be created, edited and run using Eurotron series calibrators, collect test data, and generate calibration reports and certificates.

CalpMan 2004 Standards and Tags database includes calibration due date and evidence you when it is necessary to certify the instrument.

With just a few keystrokes you can access information about:

- Test data and error limits;
- Procedures;
- Standards;
- Equipment calibration and history.

It is an RS232 based system that allows you to automate and control UniCal, MicroCal, MicroCal P, and MicroCal T series calibrators.



Specifications

Source (Output)	Ranges	Max res.	Accuracy (% output + digits)
DC Voltage	±1.5 V ±1.5 V	100 μ V 1 mA	±(0.03% + 0.3mV) ±(0.03% + 3 mV)
DC Current	±25mA (Max load 1200 Ω)	1 μ A	±(0.03% + 5 μ V)
Squarewave	28 Frequency (0.5, 1, 2, 5, 10, 15, 25, 30, 40, 50, 60, 75, 80, 100, 120, 240, 300, 400, 480, 600, 800, 1200, 1600, 2400, 4800 Hz)	0.01 Hz	±(0.005% + 0.01 Hz)
Duty Cycle	0.39% to 99.60%	0.390625%	±(0.01% + 0.02%)
Pulse Width	1/frequency	Range/256	±(0.01% + 0.3 ms)
Amplitude	5V, ±5V, 12V, ±12V	0.1 V	±(2% + 0.2 V)
Measure (Input)	Ranges	Max res.	Accuracy (% output + digits)
DC Voltage	50 mV 500 mV, 5V, 50V 250 V	1 μ V 10 μ V 10 mV	±(0.05% + 50d) ±(0.03% + 5 d) ±(0.06% + 3d)
AC Voltage (45Hz - 20kHz)	50, 500mV, 5, 50, 250 V	1 μ V	±(1.5% + 20 d)@50/60 Hz
DC Current	50 mA, 500mA	1 μ A	±(0.3% + 5 d)
AC Current (45Hz - 2kHz)	50 mA, 500mA	1 μ A	±(0.6% + 20 d)
AC+DC Voltage	50, 500 mA, 5, 50, 250 V	1 μ V	±(0.8% +25 d)@50/60 Hz
AC+DC Current	50 mA, 500mA	1 μ A	±(1.2% + 10 d)
1 ms Peak Hold (Glitch capture)	50, 500 mA, 5, 50, 250 V 50 mA, 500mA	1 μ V 1 μ A	±(2% + 400 d) ±(2% + 400 d)
Resistance	500 Ω , 5, 50, 500k ,5M Ω 50 M Ω	0.01 Ω 1k Ω	±(0.15% + 5 d) ±(1% + 5 d)
Temperature (type K)	-40°F to 2502°F -40°C to 1372°C	1/0.1°F 1/0.1°C	±(0.3% + 6°F) ±(0.3% + 3°C)
Frequency	100Hz, 1, 10, 100, 200kHz	0.001 Hz	±(0.02% + 3 d)
Duty Cycle	0.1 - 99.9%		±(0.3% per kHz + 0.3%) f.s.
Pulse Width	0.2 - 1999.9 ms		±(0.2% + 3 d)
Diode check	1.65mA@4.8V		
Continuity	Beeper <10 Ω on 500 Ω range		
Dimensions / Weight	1.45 x 3.54 x 7.56"(37 x 90 x 192mm) / 32 oz. (940g)		

Non-Contract Document - Subject To Change

UniCal MMX3 Process Calibrator-Multimeter

A single instrument to perform all most common tests and calibrations on process control equipments and systems. 15 different functions available in a rugged, compact, two channel and dual LCD display unit.

Source / Simulate

- Constant bipolar Voltage source
- Constant bipolar Current source
- Simulate current using external loop power
- Frequency (square wave) source
selectable amplitude
variable duty cycle
variable pulse width
- Programmable source for automatic testing
manual stepping
Automatic stepping
Automatic ramping

Measure

- Voltage
- Current
- DC inputs
- True RMSAC and AC+DC
- Min, Max and Average values
- Frequency duty cycle and pulse width
- Temperature
- Ohms and Continuity
- Diode
- 1 mS fast peak hold

Data collection

RS232 interface optional cable and data collection software.

Ordering Code

UniCal MMX3 Cat. 3421 - A - B	
Table A	Accessories
0	None
1	RS232 cable with Windows software
Table B	Calibration certificate
0	None
1	E-instruments Report