UniCal

eurotron Microcal

Innovative Instrumentation Solutions
A unit of E instruments Group LLC

Hand-Held Calibrators for In-Field Maintenance

Superior Accuracy: up to 0.04%rdg

Hand Held

Easy to Use

Low Cost

Ready for the Future: RS232, Memory, Ramp & Step

CalpMan 2004
Documenting software for your calibration and test activities in compliance with ISO9000

UniCal mA

UniCal Tc

UniCal Rtd

UniCal MMX3

All descriptions are related to a fully optioned instrument. See last page for the different configurations.

UniCal

HAND-HELD INSTRUMENTS WITHOUT COMPROMISE

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.

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

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:

Code	Description
MATC	UniCal mA + UniCal Tc
MARTD	UniCal mA + UniCal Rtd

UniCal

PROFESSIONAL PERFORMANCE WITH LOW PRICE

eurotron Microcal
Innovative Instrumentation Solutions

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;
< 4000Ω: 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 1000Ω
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)	OIML1985
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)	
	20 to 4000Ω	1Ω	±(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 1200°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°C	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%+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)

UniCal

DOCUMENT YOUR CALIBRATION ACTIVITIES

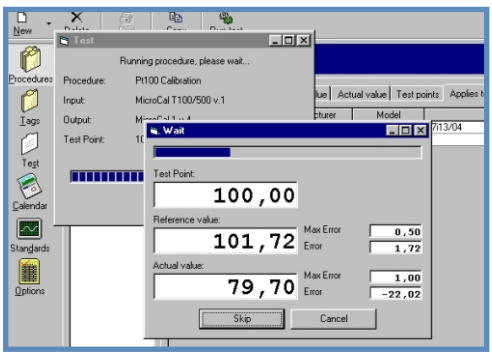
CalpMan 2004
Calibration Management Software

UniCal MMX3
Process Calibrator-Multimeter

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.



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 RMS AC 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

Specifications

Source (Output)	Ranges	Max res.	Accuracy (% output + digits)
DC Voltage	±1.5 V	100µV	±(0.03% + 0.3 mV)
	±15 V	1 mV	±(0.03% + 3 mV)
DC Current	±25 mA	1µA	±(0.03% + 5 µA)
	(Max load 1200Ω)		
Squarewave	28 Frequency	0.01 Hz	±(0.005% + 0.01 Hz)
	(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)		
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 (% rdg + digits)
DC Voltage	50 mV	1 µV	±(0.05% + 50 d)
	500 mV, 5V, 50V	10 µV	±(0.03% + 5 d)
	250 V	10 mV	±(0.06% + 3 d)
AC Voltage (45Hz - 20kHz)	50, 500 mV, 5, 50, 250 V	1 µV	±(1.5% + 20 d) @50/60 Hz
DC Current	50 mA, 500 mA	1µA	±(0.3% + 5 d)
AC Current (45Hz - 2kHz)	50 mA, 500 mA	1µA	±(0.6% + 20 d)
AC+DC Voltage	50, 500 mV, 5, 50, 250 V	1 µV	±(0.8% + 25 d) @50/60 Hz
AC+DC Current	50 mA, 500 mA	1µA	±(1.2% + 10 d)
1 ms Peak Hold (Glitch	50, 500 mV, 5, 50, 250 V	1 µV	±(2% + 400 d)
capture)	50 mA, 500 mA	1µA	±(2% + 400 d)
Resistance	500Ω, 5, 50, 500kΩ, 5MΩ	0.01Ω	±(0.15% + 5 d)
	50 MΩ	1kΩ	±(1% + 5 d)
Temperature (type K)	-40 °F to 2502 °F	1/0.1 °F	±(0.3% + 6 °F)
	-40 °C to 1372 °C	1/0.1 °C	±(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	1.65 mA @ 4.8 V		
Continuity	Beeper < 10Ω on 500Ω range		
Dimensions/Weight	1.45x3.54x7.56" (37x90x192mm) / 32 oz. (940g)		

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