

Microcal 8

Multifunction Calibrator



MULTIFUNCTION CALIBRATOR

Accuracy up to $\pm 0.03\%$ of reading

Light, rugged and ergonomic

Ready to use on field and in laboratory

Push & Lock connectors, TC e Banana (4 mm)

Two Channels High accuracy

Auto-detect rtd wires

Set the generated values with alphanumeric Key-Pad

Large graphic display backlit

Rubber protection holster

Generate ramp and cycles

Measure and simulate simultaneously for certificate the transmitters

Measure and simulate simultaneously of Tc, rtd, mA e V





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General

The hand-held indicator-simulator MicroCal 8, is multifunction instrument designed to check and to calibrate your test and process equipment. MicroCal 8 meet, in a modern and practical way, the everyday needs of Quality and Maintenance instrumentation engineers, both in laboratory and in field work. Accurate, compact, rugged, easy to use; the ideal solution to measure and simulate: millivolt, volt, milliampere (active and passive loop), ohm, temperatures with thermocouples, temperatures with resistance thermometers.



MicroCal 8 is a portable calibrator able to measure and to generate simultaneously on 2 isolated channels. It has a wide backlit display with high contrast to be used for application in dark room. Full protected by the sheath, a keypad in lexan protects it from dirties and numerical keypad knocked up is usable even using protective gloves. It is able to measure and generate voltage, current (active and passive loop), resistance signals and also resistive probes and thermocouples.





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Advanced Features

"Push&Lock" system

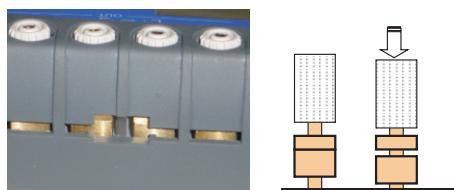
This unique system is used by pushing on the terminal's top, by inserting:

- Wires with a diameter up to 3 mm,
- Compensated thermocouple connectors,
- Pin terminal on front panel,

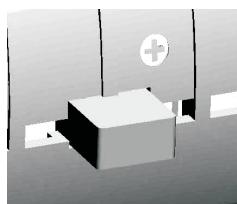
Wires are tighten between 2 brass plates which provide an great thermal gradient, so that allows a very good cold junction compensation for thermocouples.

Microcal 8 allows 4mm connectors and also security connectors to be connected on the front panel.

Push&Lock connector



Mini-din connector



Display

MicroCal 8 dual display indicates permanently the measurement value, and also the emitted value, the gauge and the used functions.

On the top date, time and also external temperature are also indicated.

During measuring average, maximum, minimum and the number of measurements are displayed on the left. While for emission this part of screen displays all details of ramps, steps and constant value emission functions.

Drop-down menus are used with the navigator, and an on-line help is available to make easier connections of probes and wires.



File Menu:

User can save up to 10 full configurations of the instruments and recall them whenever. Configurations can be saved and recalled in function of user and of use. Configurations include all programming done on instrument, as the range.

Contrast adjustment:

Screen's contrast can be adjusted whenever to fit with measurement environment

Screen Backlighting:

Time of backlighting can be programmed to save battery

Autonomy: MicroCal 8 autonomy is 8 hours in the worst condition of use

Scaling:

In measurement and simulation, scaling allows process signals to be displayed in % of FS or in all other unit. This function also allows sensors to be corrected after a calibration

Relative measurement:

Programming of a reference value different from the one of the instrument (NUL function)
Substracting of constant value by measuring or programming it from a measured value(TARE function)

Square root:

In current measurement and simulation, this function allows to take into account a quadratic signal coming from transmitter of type ΔP

Statistical functions:

Average, minimum, maximum and also number of measurements done are always displayed.
Reset key allows values to be updated.

Simulation Menu:

Simulation value is set by entering value on keypad or by changing the according digit with the cursor

Ramps generation:

Starting, ending and length time values of simple or cyclic ramps can be set to do simulation.
Number of ramps can also be adjusted in case of cyclic ramps for any signals.

Steps simulation:

2 modes are proposed.
Program mode: Starting value, number of steps and the length time have to be set

Manual mode: User has about a hundred of preset values

In current simulation, user will have some additional preset values in function of range and according to 0%, 25%, 50%, 75% and 100% from selected gauge. Choice is done between gauges:

0-20mA: linear or quadratic

4-20mA: linear or quadratic

Synthesizer:

With 100 values manually set, MicroCal 8 allows curve generation to be remade.

Transmitter function:

MicroCal 8 is able to be used as a transmitter.
Measurement input is copied on the output with scaling.



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Probes	Range IN	Resolution	Accuracy IN	Probes	Range OUT	Resolution	Accuracy OUT
K	- 250 - 200°C	0,2°C	1,00°C	K	- 240 - 50°C	0,2°C	0,70°C
	- 200 - 120°C	0,1°C	0,30°C		- 50 - 0°C	0,1°C	0,5°C
	- 120 - 0°C	0,05°C	0,15°C		+0 +1372°C	0,05°C	0,03 %R+0,1°C
	+0 + 1372°C	0,05°C	0,03 %L+0,1°C				
T	- 250 - 200°C	0,2°C	0,80°C	T	- 240 - 100°C	0,2°C	0,60°C
	- 200 - 100°C	0,05°C	0,30°C		+0 +400°C	0,05°C	0,03 %R+0,15°C
	- 100 +80°C	0,05°C	0,03 %L+0,15°C	J	- 210 - 0°C	0,05°C	0,30°C
	+80 +400°C	0,05°C	0,03 %L+0,10°C		+0 +1200°C	0,05°C	0,03 %R+0,10°C
J	- 210 - 120°C	0,05°C	0,25°C	E	- 240 +40°C	0,1°C	0,25°C
	- 120 - 0°C	0,05°C	0,15°C		+40 +1000°C	0,05°C	0,03 %R+0,20°C
	+0 +1200°C	0,05°C	0,03 %L+0,10°C				
E	- 250 - 200°C	0,1°C	0,60°C	R	- 50 +350°C	0,5°C	0,03 %R+0,50°C
	- 200 - 100°C	0,05°C	0,25°C		+350 +900°C	0,2°C	0,03 %R+0,30°C
	- 100 +1000°C	0,05°C	0,03 %L+0,1°C		+900 +1768°C	0,1°C	0,03 %R+0,30°C
R	- 50 + 150°C	0,5°C	0,90°C		- 50 +120°C	0,5°C	0,8°C
	+ 150 + 550°C	0,2°C	0,45°C		+120 +450°C	0,2°C	0,02 %R+0,40°C
	+ 550 + 1500°C	0,1°C	0,60°C		+450 +1768°C	0,1°C	0,03 %R+0,30°C
	+ 1500 + 1768°C	0,1°C	0,80°C	B	+400 +850°C	0,2°C	0,03 %R+0,7°C
S	- 50 + 150°C	0,5°C	0,80°C		+850 +1820°C	0,1°C	0,03 %R+0,3°C
	+ 150 + 550°C	0,2°C	0,45°C				
	+ 550 + 1450°C	0,1°C	0,65°C				
	+ 1450 + 1768°C	0,1°C	0,85°C	U	- 200 - 0°C	0,05°C	0,20°C
B	+ 400 + 900°C	0,2°C	0,90°C		+0 600°C	0,05°C	0,03 %R+0,15°C
	+ 900 - 1820°C	0,1°C	0,65°C				
U	- 200 + 100°C	0,05°C	0,25°C	L	- 200 + 900°C	0,05°C	0,30°C
	- 100 + 660°C		0,03 %R + 0,11				
L	- 200 + 900°C	0,05°C	0,3°C				
C	- 20 + 1700°C	0,1°C	0,03 %R+0,35°C	C	- 20 + 800°C	0,1°C	0,50°C
	+ 1700 + 2 310°C	0,1°C	0,07 %R		+800 + 1540°C	0,1°C	0,03 %R+0,5°C
N	- 240 - 190°C	0,2°C	0,45%R		+1540 + 2 310°C	0,1°C	0,05 %R+0,5°C
	- 190 - 110°C	0,1°C	0,20%R				
	- 110 - 0°C	0,05°C	0,04 %R + 0,15°C				
	+ 0 + 1000°C	0,05°C	0,03 %R + 0,12°C				
	+ 1000 + 1300°C	0,05°C	0,03 %R+0,15°C	Platino	- 100 + 1400°C	0,05°C	0,03 %R+0,15°C
Platino	- 100 + 1400°C	0,05°C	0,03 %R + 0,15°C				
M o	0 + 1375°C	0,05°C	0,03 %R + 0,20°C				
NiM o/NiCo	- 50 + 14 10°C	0,05°C	0,03 %R + 0,30°C	Mo	0 + 1375°C	0,05°C	0,03 %R + 0,20°C
D	+ 0 + 310°C	0,1°C	0,035 %R + 0,30°C				
	+ 310 + 23 15°C	0,05°C	0,035 %R + 0,30°C	NiM o/NiCo	- 50 + 14 10°C	0,05°C	0,03 %R + 0,30°C
G	+ 0 + 100°C	0,5°C	2,4°C		+0 + 310°C	0,1°C	0,035 %R + 0,30°C
	+ 100 + 300°C	0,2°C	0,6°C		+ 310 + 23 15°C	0,05°C	0,035 %R + 0,30°C
	+ 300 + 1300°C	0,05°C	0,03 %R + 0,30°C				
	+ 1300 + 1800°C	0,05°C	0,03 %R + 0,30°C				
	+ 1800 + 23 15°C	0,05°C	0,05 %R	D	+0 + 100°C	0,5°C	2,4°C
					+ 100 + 300°C	0,2°C	0,6°C
					+ 300 + 1300°C	0,05°C	0,03 %R + 0,30°C
					+ 1300 + 1800°C	0,05°C	0,03 %R + 0,30°C
					+ 1800 + 23 15°C	0,05°C	0,05 %R+0,5°C

Accuracy is warranted for reference junction (RJ) at 0°C
With use of internal RJ (except couple B) add a additional
uncertainty of 0,3°C
CJC localisation can be selected by keypad programming,
except for couple B:
External at 0°C, internal (temperature compensation of
instrument's terminals) or by temperature programming
Temperature coefficient: <10% of accuracy /°C. Display unit:
°C and F.



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Probes	Range IN	Resolution	Accuracy IN
Pt 50 (a = 3851)	- 220°C + 1200°C	0,01°C	0,03 %R+ 0,06°C
Pt 100 (a = 3851)	- 220°C + 1200°C	0,01°C	0,03 %R+ 0,05°C
JPt 100 (a = 3916)	- 200°C + 510°C	0,01°C	0,03 %R+ 0,05°C
Pt 100 (a = 3926)	- 210°C + 850°C	0,01°C	0,03 %R+ 0,05°C
Pt 200 (a = 3851)	- 220°C + 600°C	0,01°C	0,03 %R+ 0,12°C
Pt 500 (a = 3851)	- 220°C + 1200°C	0,01°C	0,03 %R+ 0,07°C
Pt 1000 (a = 3851)	- 220°C + 1200°C	0,01°C	0,03 %R+ 0,05°C
Ni 100 (a = 618)	- 60°C + 180°C	0,01°C	0,03 %R+ 0,03°C
Ni 120 (a = 672)	- 40°C + 205°C	0,01°C	0,03 %R+ 0,03°C
Ni 1000 (a = 618)	- 60°C + 180°C	0,01°C	0,03 %R+ 0,03°C
Cu 10 (a = 427)	- 70°C + 150°C	0,1°C	0,03 %R+ 0,18°C
Cu 50 (a = 428)	- 50°C + 150°C	0,01°C	0,03 %R+ 0,06°C

Probes	Range OUT	Resolution	Accuracy OUT
Pt 50 (a = 3851)	- 220°C + 1200°C	0,03°C	0,03 %R+ 0,18°C
Pt 100 (a = 3851)	- 220°C + 850°C	0,02°C	0,03 %R+ 0,12°C
Pt 100 (a = 3916)	- 200°C + 510°C	0,02°C	0,03 %R+ 0,12°C
Pt 100 (a = 3926)	- 210°C + 850°C	0,02°C	0,03 %R+ 0,12°C
Pt 200 (a = 3851)	- 220°C + 1200°C	0,10°C	0,03 %R+ 0,33°C
Pt 500 (a = 3851)	- 220°C + 1200°C	0,03°C	0,03 %R+ 0,18°C
Pt 1000 (a = 3851)	- 220°C + 850°C	0,02°C	0,03 %R+ 0,08°C
Ni 100 (a = 618)	- 60°C + 180°C	0,01°C	0,03 %R+ 0,08°C
Ni 120 (a = 672)	- 40°C + 205°C	0,01°C	0,03 %R+ 0,08°C
Ni 1000 (a = 618)	- 60°C + 180°C	0,01°C	0,03 %R+ 0,08°C
Cu 10 (a = 427)	- 70°C + 150°C	0,01°C	0,03 %R+ 0,10°C
Cu 50 (a = 428)	- 50°C + 150°C	0,03°C	0,03 %R+ 0,15°C

Resistive probes measurements in 2,3 or 4 wires: automatic recognition of number of connected wires, with indication on screen

Temperature coefficient: < 10 % of accuracy /°C.

The accuracy in table above is given for a sensor connection in 4 wires

Take into account peculiar error of temperature sensor used and implementation conditions

Measurement current: 0.01mA to 1mA

Establishing time: <1ms for simulation (simulation on quick transmitters)



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Range IN	Resolution	Accuracy IN	Notes
100mV [-100mV +100mV]	1 mV	0,030% + 3 mV	Rin > 10 MW
1V [-100mV +1V]	10 mV	0,030% + 20 mV	Rin > 10 MW
20V -100mV 20 V	1 mV	0,030% + 2 mV	Rin = 1 MW
24 mA 0mA 24mA	1 mA	0,030% + 2 mA	Rin < 30 W
4-20 mA 3,2mA 24mA	1 mA	0,030% + 2 mA	Rin < 30 W
0-20 mA 0mA 24mA	1 mA	0,030% + 2 mA	Rin < 30 W
400 Ohm 0 Ohm to 400 Ohm	1 mOhm	0,012% + 10 mOhm	Measure current = 0,25 mA
4000 Ohm 0 Ohm 4000 Ohm	10 mOhm	0,012% + 100 mOhm	Measure current = 0,25 mA

Range OUT	Resolution	Accuracy OUT	Notes
10 0 mV [-10 0 mV to +10 0 mV]	1mV	0,03 %L + 3 mV	M in load = 1 KOhm
2 V [-10 0 mV to +2 V]	10 mV	0,03 %L + 20 mV	M in load = 2 KOhm
10 V [-10 0 mV to +10 V]	100 mV	0,03 %L + 200 mV (1)	M in load = 4 KOhm
2 4 mA [da 0 a 24 mA]	1mA	0,03 %L + 2 mA	
4 - 2 0 mA [da 3,2 a 24 mA]	1mA	0,03 %L + 2 mA	
0 - 2 0 mA [da 0 a 24 mA]	1mA	0,03 %L + 2 mA	Active loop (+24V ON) Passive loop (+24V OFF)
4 0 Ohm	1mOhm	0,03 %L + 3 mOhm (1) 0,03 %L + 10 mOhm (2)	(1) ext from 10 mA (2) ext from 1mA
4 0 0 Ohm	10 mOhm	0,03 %L + 20 mOhm(1) 0,03 %L + 30 mOhm (2)	(1) ext from 1mA / 10 mA (2) ext from 0,1mA / 1mA
4 0 0 0 Ohm	100 mOhm	0,03 %L + 300 mOhm	ext from 0,1 to 1mA

Technical specification:

Measure and generate Tc, rtd, mV and mA
Automatic ramps or steps outputs with function for valves verification
Scale function
Continuity test
250 series resistor for HART devices.
Scale function
5 languages menu
Supply: Ni-MH battery pack with charger
Autonomy: up to 10 hours
Reference condition: 23°C ± 5°C, relative humidity: 45 % to 75 %
Nominal using conditions: -10°C up to + 50°C, relative humidity: 20 % up to 80 % without condensation.
Limit stocking and transporting conditions: - 30°C up to + 60°C (without battery).
Dimensions: 210mm x 110mm x 50mm
Weight: 900g
Electrical security according to EN 61010
Electromagnetic compatibility of electrical equipment according to EN61326

Ordering Codes:

3908 - A - 1 - 1\ENG

Instruction manual (english)

1-Traceable calibration certificate

Rubber holster

1-Battery pack+charger EU

2-Battery pack+charger UK

3-Battery pack+charger USA

4-Battery pack+charger Schuko

Accessories:

- Transport case for MicroCal (8AN605)0
- USB link for MicroCal 8 (ER 49504-000)
- Set of 6 measuring cables with removable (ACL9311)

Standard supply:

MicroCal 8 is supplied in standard with 6 testing leads, a quick battery charging system, traceable calibration certificate and an instruction manual