eurotron

"Excellence in measurements"

NEW

Microcal 16

Multifunction Calibrator

MULTIFUNCTION CALIBRATOR

- Accuracy up to ±0.007% 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 backlited
- Rubber protection holster
- Generate ramp and cycles
- Measure and simulate simultaneously for certificate the transmitters
- Measure and simulate simultaneously of Tc, rtd,Hz, mA e V
- External pressure sensors
- Measurement data recording

CE

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MULTIFUNCTION CALIBRATORS

MicroCal 16
Multifuction calibrator

General

The hand-held indicator-simulator MicroCal 16 is a multifunction instrument
designed to check and calibrate your test and process equipment. MicroCal 16 meets, in a modern and practical way, the everyday needs of Quality and Maintenance instrumentation engineers, both in laboratory and on field.
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, frequency and pressure (with ext, sensors).

MicroCal 16 is a portable calibrator able to measure and to generate simultaneously on 2 isolated channels. It has a wide backlighted 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),frequency, pressure (with ext. sensors), resistance signals and also resistive probes and thermocouples.
MicroCal 16 is able to record up to 10.000 data and with a DATACAL software becomes a documenting calibrator able to generate calibration certificate.

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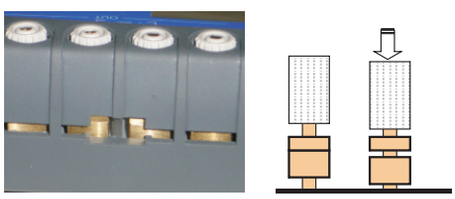
Advanced Features

"Push&Lock" system

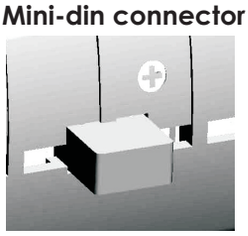
This unique system is used by pushing on the terminal's top, by inserting:
- Wires with a diameter up to 3 mm,
- Compensated thermocouple connectors,
- Pin terminal on front panel,

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

Push&Lock connector



Mini-din connector



Display

MicroCal 16 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 Plus 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 16 allows curve generation to be remade.

Transmitter function:
MicroCal 16 is able to be used as a transmitter.
Measurement input is copied on the output with scaling.

Memory:
MicroCal 16 can record data automatically or on user request. 10.000 data can be stored and displayed on the screen as curve or list, and is possible download this data with DATACAL Light software.

Calibration software:
DATACAL software, with Micorcal16, is able to certificate all the trasmitters and trasducers. With the software is possible to have a calibration certificate.

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Table of ranges and accuracies

	Measurement			Generation		
Type	Range	Resolution	Accuracy / 1 yr	Range	Resolution	Accuracy / 1 yr
K	- 250 to - 200°C	0,2°C	0,70°C	- 240 to - 50°C	0,2°C	0,50°C
	- 200 to - 120°C	0,1°C	0,20°C	- 50 to - 0°C	0,1°C	0,09°C
	- 120 to - 0°C	0,05°C	0.1°C	+ 0 to + 1 372°C	0,05°C	0,013 % R + 0,07°C
	+ 0 to + 1 372°C	0,05°C	0,010 % R +0,08°C			
T	- 250 to - 200°C	0,2°C	0,60°C	- 240 to - 100°C	0,20°C	0,35°C
	- 200 to - 120°C	0,05°C	0,20°C	- 100 to - 0°C	0,05°C	0,09°C
	- 120 to - 50°C	0,05°C	0.10 °C	+ 0 to + 400°C	0,05°C	0,010 % R + 0,08°C
	- 50 to + 400°C	0,05°C	0,010 % R +0,08°C			
J	- 210 to - 120°C	0,05°C	0,20°C	- 210 to - 0°C	0,05°C	0,18°C
	- 120 to - 0°C	0,05°C	0.09°C	+ 0 to + 1 200°C	0,05°C	0,010 % R + 0,07°C
	+ 0 to + 1 200°C	0,05°C	0,010 % R +0,07°C		0,05°C	
E	- 250 to - 200°C	0,1°C	0,40°C	- 240 to - 100°C	0,1°C	0,20°C
	- 200 to - 100°C	0,05°C	0,13°C	- 100 to + 40°C	0,1°C	0,09°C
	- 100 to - 0°C	0,05°C	0.07°C	+ 40 to + 1 000°C	0,05°C	0,010 % R + 0,05°C
	+ 0 to + 1 000°C	0,05°C	0,010 % R +0,05°C			
R	- 50 to + 150°C	0,5°C	0,7°C	- 50 to + 350°C	0,50°C	0,45°C
	+ 150 to + 550°C	0,2°C	0,010 % R +0,30°C	+ 350 to + 900°C	0,20°C	0,010 % R + 0,35°C
	+ 550 to + 1 768°C	0,1°C	0,010 % R + 0,2°C	+ 900 to + 1 768°C	0,10°C	0,010 % R + 0,2°C
S	- 50 to + 150°C	0,5°C	0,70°C	- 50 to + 120°C	0,50°C	0,70°C
	+ 150 to + 550°C	0,2°C	0,010 % R +0,35°C	+ 120 to + 450°C	0,20°C	0,010 % R + 0,35°C
	+ 550 to + 1 768°C	0,1°C	0,010 % R +0,25°C	+ 450 to + 1 768°C	0,10°C	0,010 % R + 0,25°C
B	+ 400 to + 900°C	0,2°C	0,010 % R + 0,4°C	+ 400 to + 850°C	0,20°C	0,010 % R + 0,4°C
	+ 900 to + 1 820°C	0,1°C	0,010 % R+ 0,2°C	+ 850 to + 1 820°C	0,10°C	0,010 % R+ 0,2°C
U	- 200 to + 660°C	0,05°C	0,15°C	- 200 to 600°C	0,05°C	0,13°C
L	- 200 to + 900°C	0,05°C	0,2°C	- 200 to + 900°C	0,05°C	0,17°C
C	- 20 to + 900°C	0,1°C	0,20°C	- 20 to + 900°C	0,10°C	0,23°C
	+ 900 to + 2 310°C	0,1°C	0,010 % R+ 0,15°C	+ 900 to + 2 310°C	0,10°C	0,010 % R+ 0,15°C
N	- 240 to - 190°C	0,2°C	0,4°C	- 240 to - 190°C	0,20°C	0,25°C
	- 190 to - 110°C	0,1°C	0,10°C	- 190 to - 110°C	0,10°C	0,13°C
	- 110 to – 0°C	0,05°C	0,08°C	- 110 to – 0°C	0,05°C	0,08°C
	+ 0 to + 1 300°C	0,05°C	0,010 % R +0,06°C	+ 0 to + 1 300°C	0,05°C	0,010 % R + 0,06°C
PR	- 100 to + 1 400°C	0,05°C	0,25°C	- 100 to + 1 400°C	0,05°C	0,25°C
Mo	0 to + 1 375°C	0,05°C	0,010 %R + 0,06°C	0 to + 1 375°C	0,05°C	0,010 %R + 0,06°C
NiMo/NiCo	- 50 to + 1 410°C	0,05°C	0,010 %R + 0,30°C	- 50 to + 1 410°C	0,05°C	0,010 %R + 0,30°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.

	Measurement		
Range	Resolution	Accuracy / 1 yr	Remarks
±100mV	1 µV	0,01%R + 3 µV	Rin > 10 Mohm
±1V	10 µV	0,01%R + 20 µV	Rin > 10 MOhm
±10V	100 µV	0,012%R + 200 µV	Rin = 1MOhm
±50V	1 mV	0,012%R + 2 mV	Rin = 1MOhm

	Generation		
Range	Resolution	Accuracy / 1 yr	Remarks
100mV	1 µV	0,010% R+ 3 µV	Load 1KOhm
2V	10 µV	0,012% R+ 20 µV	Load 2KOhm
20V	100 µV	0,012% R+ 200 µV	Load 4KOhm

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Type	Range	Resolution Measurement	Accuracy / 1 yr	Resolution Generation	Accuracy generation / 1 yr
Pt 50(á = 3850)	-220°C + 1 200°C	0,01°C	0,010 % R+ 0,06°C	0,03°C	0,012 % R+ 0,18°C
Pt 100 (á = 3850)	-220°C + 1 200°C	0,01°C	0,010 % R+ 0,05°C	0,02°C	0,012 % R+ 0,12°C
JPt 100 (á = 3916)	-200°C + 510°C	0,01°C	0,010 % R+ 0,05°C	0,02°C	0,012 % R+ 0,12°C
Pt 100 (á = 3926)	-210°C + 850°C	0,01°C	0,010 % R+ 0,05°C	0,02°C	0,012 % R+ 0,12°C
Pt 200 (á = 3851)	-220°C + 600°C	0,01°C	0,010 % R+ 0,12°C	0,10°C	0,012 % R+ 0,33°C
Pt 500 (á = 3850)	-220°C + 1 200°C	0,01°C	0,010 % R+ 0,07°C	0,03°C	0,012 % R+ 0,18°C
Pt 1 000 (á = 3851)	-220°C + 1 200°C	0,01°C	0,010 % R+ 0,05°C	0,02°C	0,012 % R+ 0,08°C
Ni 100 (á = 618)	-60°C + 180°C	0,01°C	0,010 % R+ 0,03°C	0,01°C	0,012 % R+ 0,08°C
Ni 120 (á = 672)	-40°C + 205°C	0,01°C	0,010 % R+ 0,03°C	0,01°C	0,012 % R+ 0,08°C
Ni 1 000 (á = 618)	-60°C + 180°C	0,01°C	0,010 % R+ 0,03°C	0,01°C	0,012 % R+ 0,08°C
Cu 10 (á = 427)	-70°C + 150°C	0,1°C	0,010 % R+ 0,18°C	0,01°C	0,012 % R+ 0,10°C
Cu 50 (á = 428)	-50°C + 150°C	0,01°C	0,010 % R+ 0,06°C	0,03°C	0,012 % 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)

	Measurement		
Range	**Resolution**	**Accuracy / 1 yr**	**Remarks**
400 Ohm	1 mOhm	0.010% R+ 10 mOhm	Measurament current = 0.25 mA
4000 Ohm	10 mOhm	0.010% R+ 100 mOhm	Measurament current = 0.25 mA

	Generation		
Range	**Resolution**	**Accuracy / 1 yr**	**Remarks**
400 Ohm	10 mOhm	0.012% + 30 mOhm	Iext da 0.1 a 10 mA
4000 Ohm	100 mOhm	0.012% + 300 mOhm	Iext da 0.1 a 1 mA

	Measurement	
Range	**Resolution**	**Accuracy / 1 yr**
20 kHz	< 0.01 Hz	0.005%R

Threshold triggering: 1V
Unite scale: pulse/min or Hz
Measurement on frequency signal and on dry contacts
Measurement for counting will be done on defined time or on infinite

	Generation	
Range	**Resolution**	**Accuracy / 1 yr**
1000 Hz	< 0.01 Hz	0.005% R
10 kHz	1 Hz	0.005% R

Unite scale: pulse/min or Hz
Pulse emissions
Dry contact simulation
Max amplitude: 20V selectable by user

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	Measurement		
Range	**Resolution**	**Accuracy / 1 yr**	**Remarks**
±50mA	1 µA	0,012%R + 2 µA	Rin < 25 ?

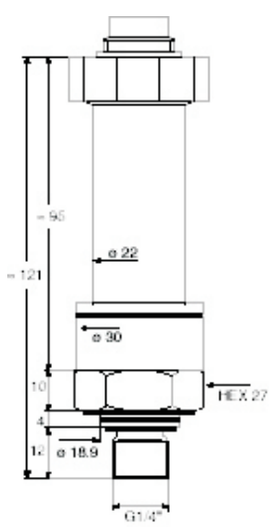
	Generation	
Range	**Resolution**	**Accuracy / 1 yr**
24mA	1 µA	0,012%R + 2 µA

	0%	25%	50%	75%	100%
4-20mA linear	4	8	12	16	20
0-20mA linear	0	5	10	15	20
4-20mA quad.	4	5	8	13	20
0-20Ma quad.	0	1,25	5	11,25	20
4-20mA Valves	3,8-4 -4,2		12	19,20,21	

External pressure sensors:

Range (Bar)	ABS	Relative
0 - 1	X	X
0 - 3	X	X
0 - 10	X	X
0 - 30	X	X
0 - 100	X	
0 - 300	X	
0 - 1000	X	

Resolution: 0,02% f.s.
Accuracy: 0,05% f.s. be0°C and 40°C; -0,1% f.s. between -10°C + 10°C and 40°C to 80°C



(G1/4")

Ordering Codes:

MicroCal 16- A - 1 - 1\ENG

- Instruction manual (english)
- 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

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 lenguages menu
Supply: Ni-MH battery pack with charger
Autonomy:up to 10 houres
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.
USB Interface
Connection for external pressure sensor
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

Accessories:
External pressure sensors:

- 0 - 1 Bar (g;abs)
- 0 - 3 Bar (g;abs)
- 0 - 10 Bar (g;abs)
- 0 - 30 Bar (g;abs)
- 0 - 100 Bar (abs)
- 0 - 300 Bar (abs)
- 0 - 1000 Bar (abs)

- Transport case for MicroCal 16 (AN605)0
- USB link for MicroCal 16 (ER 49504-000)
- Set of 6 measuring cables with removable (ACL9311)
- DATACAL Light software
- DATACAL software

Standard supply:
MicroCal 16 is supplied in standard with 6 testing leads, a quick battery charging system, traceable calibration certificate and an instruction manual

Specifications may change without notice

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