multifunction calibrator
CALYS 10

The calibrator CALYS 10 is designed to meet all the growing requirements of the calibration and maintenance departments, either on site or in laboratories.
Built in with a protective housing and with a quick charge battery, it can control, verify and calibrate all the instruments entering in the process in industrial areas.

- **Simultaneous measurement and emission**
- **Temperature and process signals**
- **Pressure: - 1 bar up to 1000 bar**
- **Automatic transmitter test**
- **Data storage**
- **On site automatic calibration**

Application

Thanks to its ergonomic shape, its battery lifetime, the CALYS 10 is particularly designed for the control and calibration and on site maintenance for controllers, valves, panel meters, recorders and all the instruments involved into the process loop.

If the industrial environment is its best place, it can also be used in laboratory, R&D department, production services.
Its dual display eases the controller and transmitter test, generating onto the input and measuring the output signal of the transmitter.

Description

User friendly, it also has a large number of functions:
- Dc current measurement and emission
- Dc voltage measurement and emission
- Temperature (RTD and thermocouples) measurement and simulation
- Resistance measurement and simulation
- Pressure with external modules.

The measurement and emission are performed independently and simultaneously. The dual display makes the calibration tests easy.

The CALYS 10 offers also the possibility to linearise signals with a large choice of units, to trigger measurements, to perform relative measurements, generation of ramps, increments and memorised values.
A built-in RS 232 interface is in standard for communication with a PC.
Its software, the LCL CAL 10 allows the user to configure the calibrator and to create calibration procedures, to download data from the CALYS 10 and to print out calibration report or measurement curves.

It is useful to program calibration procedure, as well as to print out the calibration certificates.

Its NiMh battery allows an intensive use and a quick charge in less than 3 hours.
Thanks to its belt, it can be used in "hands free" position.

functions

Measurement and emission are simultaneous and independent.

DC voltage, DC current, resistance

Measurement

Input	Measuring range	Resolution	90 days accuracy	1 year accuracy	Remarks
mV	- 60 to + 60 mV - 600 to + 600 mV	1 µV 10 µV	0.02 %+ 5 µV 0.02 % + 30 µV	0.04 % + 7 µV 0.04 % + 50 µV	I > 1 000 MΩ
V	- 6 to + 6 V - 60 to + 60 V	0.1 mV 1 mv	0.02 % + 0.3 mV 0.02 %+ 3 mV	0.04 % + 0.5 mV 0.04 % + 5 mV	I > 10 MΩ
mA	- 60 to + 60 mA	1 µA	0.02 % + 3 µA	0.04 % + 5 µA	Voltage drop < 1.2 V
Ω	0 to + 600 Ω 0 to + 6 kΩ	10 mΩ 0.1 mΩ	0.02 % + 30 mΩ 0.02 % + 0.3 Ω	0.04 % + 50 mΩ 0.04 % + 0.5 Ω	Current 1 mA Current 0.1 mA

Accuracies are given in ± (% rdg + n digits) at 23 ± 5°C.

Emission - simulation

Output	Emission range	Resolution	90 days accuracy	1 year accuracy	Remarks
mV	- 10 to + 50 mV - 100 to + 500 mV	1 µV 10µV	0.025 % + 5 µV 0.025 % + 30 µV	0.04 % + 7 µV 0.04 % + 50 µV	
V	- 1 to + 5 V - 1 to + 50 v	0.1 mV 1 mV	0.025 % +0.3 mV 0.025 % +3 mV	0.04 % + 0.5 mV 0.04 % + 5 mV	
mA	0 to 24 mA	1 µA	0.025 % + 3 µA	0.04 % + 5 µA	Voltage 30 V
Ω	0 to 500 Ω 0 to 5 000 Ω	0.01 Ω 0.1 Ω	0.025 % +0.03 Ω 0.025 % +0.3 Ω	0.04 % + 0.05 Ω 0.04 % + 0.5 Ω	Current≤ 5 mA Current ≤ 0,5 mA

Temperature by RTD

With 2, 3 or 4 wires.
In measurement resolution of 0.01°C.

Accuracy are given in ± (% rdg + n°C) at 23 ± 5°C.

Probe	Measurement			Simulation			
	Measurement range	90 days accuracy	1 year accuracy	Covered range	Resolution	90 days accuracy	1 year accuracy
Pt 50	- 220 to + 1 200°C	0.03 %+ 0.15°C	0.05 %+ 0.3°C	- 220 to + 1 200°C	0.05°C	0.04 %+ 0.15°C	0.05 %+ 0.3°C
Pt 100 (1)	- 220 to + 1 200°C	0.03 %+ 0.1°C	0.06 % + 0.2°C	- 220 to + 1 200°C	0.02°C	0.04 %+ 0.1°C	0.06 % + 0.2°C
JPt 100 (2)	- 200 to + 510°C	0.03 %+ 0.1°C	0.06 % + 0.2°C	- 200 to + 510°C	0.02°C	0.04 %+ 0.1°C	0.06 % + 0.2°C
Pt 100 (3)	- 210 to + 850°C	0,03 %+ 0.1°C	0.06 % + 0.2°C	- 210 to + 850°C	0.02°C	0.04 %+ 0.1°C	0,06 % + 0,2°C
Pt 200	- 220 to + 600°C	0.03 %+ 0.1°C	0.05 %+ 0.2°C	- 220 to + 410°C	0.02°C	0.03 %+ 0.1°C	0.05 % + 0.2°C
Pt 500	- 220 to + 1 200°C	0.03 %+ 0.15°C	0.05 %+ 0.3°C	- 220 to + 1 200°C	0.05°C	0.04 %+ 0.15°C	0.05 % + 0.3°C
Pt 1000	- 220 to + 1 200°C	0.03 %+ 0.1°C	0.06 % + 0.2°C	- 220 to + 1 200°C	0.02°C	0.04 %+ 0.1°C	0.06 % + 0.2°C
Ni 100	- 60 to + 180°C	0.1°C	0.17°C	- 60 to + 180°C	0.02°C	0.1°C	0.17°C
Ni 120	- 40 to + 205°C	0.08°C	0.15°C	- 40 to + 205°C	0.02°C	0.08°C	0.15°C
Ni 1000	- 60 to + 180°C	0.1°C	0.17°C	- 60 to + 180°C	0.02°C	0.1°C	0.17°C
Cu 10 (4)	- 70 to + 150°C	0.9°C	1.5°C	- 70 to + 150°C	0.2°C	0.9°C	1.5°C
Cu 50	- 50 to + 150°C	0.2°C	0.4°C	- 50 to + 150°C	0.05°C	0.2°C	0.4°C

(1) $\alpha = 3851$; (2) $\alpha = 3916$
(3) $\alpha = 3926$; (4) $\alpha = 427$

Temperature by thermocouples

Accuracies are given at 23 ± 5°C. Resolution in simulation is 0.1°C.

Sensor	Measurement				Simulation		
	Measurement range	Resolution	90 days accuracy	1 year accuracy	Simulation range	90 days accuracy	1 year accuracy
K	- 250 to - 200°C - 200 to - 120°C - 120 to - 50°C - 50 to + 1 372°C	0.2°C 0.1°C 0.1°C 0.1°C	1.3°C 0.4°C 0.2°C 0.03 %+ 0.1°C	2.2°C 0.7°C 0.3°C 0.05 %+ 0.2°C	- 240 to - 200°C - 200 to - 120°C - 120 to - 50°C - 50 to + 1 232°C + 1 232 to + 1 372°C	1.3°C 0.4°C 0.2°C 0.03 %+ 0.1°C 1.3°C	2.2°C 0.7°C 0.3°C 0.05 %+ 0.2°C 2.1°C
T	- 250 to - 200°C - 200 to - 100°C - 100 to + 400°C	0.2°C 0.1°C 0.1°C	1.0°C 0.4°C 0.2°C	1.7°C 0.6°C 0.3°C	- 240 to - 200°C - 200 to - 100°C - 100 to + 400°C	1.0°C 0.4°C 0.2°C	1.7°C 0.6°C 0.3°C
J	- 210 to - 150°C - 150 to + 800°C + 800 to + 1 200°C	0.1°C 0.1°C 0.1°C	0.4°C 0.2°C 0.8°C	0.6°C 0.4°C 1.3°C	- 210 to - 150°C - 150 to + 870°C + 870 to + 1 200°C	0.4°C 0.2°C 0.8°C	0.6°C 0.4°C 1.3°C
E	- 250 to - 180°C - 180 to + 700°C + 700 to + 1 000°C	0.1°C 0.1°C 0.1°C	0.7°C 0.2°C 0.6°C	1.2°C 0.4°C 1.0°C	- 240 to - 180°C - 180 to + 660°C + 660 to + 1 000°C	0.7°C 0.2°C 0.6°C	1.2°C 0.4°C 1.0°C
N	- 240 to - 190°C - 190 to - 120°C - 120 to + 900°C + 900 to + 1 300°C	0.2°C 0.1°C 0.1°C 0.1°C	1.4°C 0.5°C 0.3°C 0.4°C	2.2°C 0.8°C 0.5°C 0.7°C	- 240 to - 190°C - 190 to - 120°C - 120 to + 900°C + 900 to + 1 300°C	1.4°C 0.5°C 0.3°C 0.4°C	2.2°C 0.8°C 0.5°C 0.7°C
U	- 200 to - 100°C - 100 to + 600°C	0.1°C 0.1°C	0.3°C 0.2°C	0.5°C 0.3°C	- 200 to - 100°C - 100 to + 600°C	0.3°C 0.2°C	0.5°C 0.3°C
L	- 200 to + 900°C	0.1°C	0.25°C	0.4°C	- 200 to + 855°C + 855 to + 900°C	0.25°C 0.6°C	0.4°C 1.0°C
S	- 50 to + 150°C + 150 to + 550°C + 550 to + 1 768°C	0.5°C 0.2°C 0.1°C	1.2°C 0.7°C 0.8°C	1.8°C 1.0°C 1.3°C	- 50 to + 150°C + 150 to + 550°C + 550 to + 1 768°C	1.2°C 0.7°C 0.8°C	1.8°C 1.0°C 1.3°C
R	- 50 to + 150°C + 150 to + 450°C + 450 to + 1 768°C	0.5°C 0.2°C 0.1°C	1.4°C 0.7°C 0.7°C	2.2°C 1.0°C 1.3°C	- 50 to + 150°C + 150 to + 450°C + 450 to + 1 768°C	1.4°C 0.7°C 0.7°C	2.2°C 1.0°C 1.3°C
B	+ 400 to + 900°C + 900 to + 1 820°C	0.2°C 0.1°C	1.3°C 0.7°C	1.8°C 1.2°C	0 to + 900°C + 900 to + 1 820°C	1.3°C 0.7°C	1.8°C 1.2°C
C	- 20 to + 600°C + 600 to + 2 000°C + 2 000 to + 2 320°C	0.1°C 0.1°C 0.1°C	0.4°C 1.0°C 1.4°C	0.6°C 1.8°C 2.5°C	- 20 to + 600°C + 600 to + 2 000°C + 2 000 to + 2 320°C	0.4°C 1.0°C 1.4°C	0.6°C 1.8°C 2.5°C
Pl	- 100 to + 700°C + 700 to + 1 400°C	0.1°C 0.1°C	0.25°C 0.5°C	0.4°C 1.0°C	- 100 to + 700°C + 700 to + 1 232°C + 1 232 to + 1 395°C	0.25°C 0.5°C 1.5°C	0.4°C 0.8°C 2.4°C
Mo	0 to + 400°C + 400 to + 1 100°C + 1 100 to + 1 375°C	0.1°C 0.1°C 0.1°C	0.2°C 0.3°C 0.8°C	0.4°C 0.5°C 1.3°C	0 to + 400°C + 400 to + 1 000°C + 1 000 to + 1 375°C	0.25°C 0.4°C 0.8°C	0.5°C 0.7°C 1.3°C

Pressure measurement

Performed by a digital pressure sensor
Ranges: 0-1 bar, 0-3 bar, 0-10 bar, 0-30 bar, 0-100 bar, 0-300 bar and 0-1 000 bar.

Resolution: 0.01% of full scale.
Accuracy:
- 0.05% of full scale between 10 and 40°C,
- 0.1% of full scale between - 10 to + 10°C and from 40 to 80°C.

Supply: 8-28 V.

additional functions

- Temperature units: °C, °F, °K.
- Scaling/ linearisation: display of Y=f(x). This scaling can be designed using from 2 to 10 couples of points.
- 9 languages
French, English, German, Spanish, Dutch, Polish, Italian, Czech, Swedish.

Measurement mode

• Relative measurement
The value R is the reference measured by the CALYS 10.
Then the CALYS 10 will display D the gap between a measured value M and the value R.
D = M-R.
• Triggered measurements
- Manual acquisition
- Burst of measurement
- Threshold programming. From this threshold, all the values will be stored.
• Measurement Memory
Up to 1000 values in 128 burst can be stored. These values can be displayed on the screen with statistical values: Min, max and average.

Emission mode

• Curve simulation
Thanks to 100 memorised values, a curve can be generated to control valves, panel meters controllers.
• Increment generation
Steps are generated after programming of the amplitude, rising time and levelled time.
• Ramp
Amplitude, rising and falling time, level time are programmed to create ramps up and down.
A hold function can freeze the ramp at any moment.

Transmitter tests

These tests can be performed on all type of transmitters (temperature, current, voltage, resistance, pressure, ...). After programming of the several parameters such as signal on the IN and OUT, accuracy of the transmitter, setpoint, the input signal is simulated from the calibrator and the output (most of the time a 4-20mA or 0-10V) signal is measured by the calibrator, linearised. Then a comparison between the input and the output is performed.
A report is generated on the screen and can be edited using the LCL CAL 10 software.
12 procedures can be written and downloaded into the calibrator.

• Pressure transmitters
Thanks to a manometer type HM 28 (up to 70 bar) or pressure sensor (up to 1000 bar) and a pump, a pressure is generated. The process signal is read on the output of the transmitter and a report can be printed with a pass or fail result.

• Temperature transmitter
The temperature is generated on the input and the process signal coming from the output of the transmitter is measured. The CALYS 10 compares the input and the output, giving the pass or fail signal at the end of the test.

Panel meter test

This test is same as for transmitter but the values displayed on the indicator are entered in the calibrator through the keyboard. Results are stored, can be computerised then a report can be printed.

Calibration of temperature probes and chains

The CALYS 10 has the ability to drive temperature generators (dry-blocks or baths) If the used temperature generator is calibrated then it can be considered as a standard.
Then using the CALYS10, the calibration of a temperature probe or a chain (probe + thermometer) can be performed easily and automatically.
The CALYS 10 drives the oven or the bath, controls the temperature setpoints and stores the temperature measured by the probe.
A calibration certificate can be edited with all the data, taking into account corrections from the calibration certificate of the bath.

general specifications

Display

Graphic backlight display.

Operating conditions

0 to 50°C.
10 to 80% of relative humidity.

Waterproof: IP 41.

RS 232 connection.

Power requirements

NiMh battery, 5 elements.
Quick charge (less than 3 hours).
Lifetime: 10 hours.
Charger: 12V/400mA.

Feature

Overall dimensions: 260 x 144 x 60 mm.
Weight: < 1.5kg.

The instrument is supplied with ABS protective casing, a transport carrying case with the charger, the "hands free" belt.

configuration and exploitation software

LCL CAL 10 is used on a computer connecting the RS 232 connection. It is used under Windows.
LCL CAL 10 is useful to save time writing procedure for scaling, for calibration, to define ramps, steps on a computer and downloading them to the calibrator.
It can be used to recall and display under curve or histogram the stored data, or to apply them calculations off line, and to edit calibration test certificates.

accessories

• Digital pressure sensor:
0 - 1 bar
0 - 3 bar
0 - 10 bar
0 - 30 bar
0 - 100 bar
0 - 300 bar
0 - 1000 bar.

• RS232/RS485 adapter for pressure sensor.

ordering instructions

Multifunction calibrator	CALYS 10
Software	LCL CAL 10

Accessories

Battery pack	AN 6010
Set of 5 leads	AN 5875
RS232 9 pts male/9 pts female cable	ACL9310
RS 485/RS 232 adapter	Consult us
Pressure sensor	Consult us

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The above characteristics are subject to modification