

CALYS 1000

Table documented multifunction calibrator

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Suitable for all field and lab measurements, it can simultaneously measure, generate and record over two isolated channels various signals of temperature, pressure, resistance, process and frequency in one single instrument.

Description

CALYS 1000 is a field documenting multifunction calibrator within CALYS range. It is the perfect tool for advanced process maintenance and use on test bench in all industries.
Suitable for all field and lab measurements, it can simultaneously measure, generate and record over two isolated channels various signals of temperature, pressure, resistance, process and frequency in one single instrument.
Providing extended functionalities (temperature simulation, scaling, steps, synthesizer, statistical functions, user-programmable configurations...), CALYS 1000 makes advanced data exploitation and full data traceability easier, as well as quick access to functions by menus.
The instrument simultaneously measures and simulates:

- Temperature: Up to 0,014% RDG
- Resistance: Up to 0,012% RDG, 4 kΩ range
- Current: Up to 0,0175% RDG, 50 mA range + 24 V loop supply
- Voltage: Up to 0,013% RDG, 50 V range
- Frequency: Up to 0,005% RDG, 20 kHz range (10 kHz in simulation)
- Pressure: with an external pressure module (ref. ACL433) (comparison calibration with a pressure pump).

Calibration procedures and DATACAL software

Using this user-friendly instrument, calibration tasks can be quickly carried out over the whole process chain. Take the documenting process calibrator to the field with you during the whole week with 10 calibration procedures stored in the device.
Run the procedure after connecting the probes to the instrument and save the results for onsite easy and quick calibration. Back to the office, you can then upload the data on a computer in order to issue customized calibration certificates with dedicated calibration software DATACAL.

Innovative and ergonomic design



- Metal housing for enhanced robustness
- Capacitive touch panel
- USB communication
- Carrying handle
- Battery and main powered

Graphic screen and display resolution

CALYS 1000 allows the digit number after the dot to be selected: This function is justified by the needs of users who want or not to display the best resolution for calibration or on the contrary limit it for simple verifications.
CALYS 1000 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.

Specifications

Performances & technical specifications in temperature @23°C ±5°C

Uncertainty is given in % of reading + fixed value.

Resistive probes: Measurement and simulation

Probe type	Range	Measurement		Emission	
		Resolution	Accuracy / 1 year	Resolution	Accuracy / 1 year
Pt50 (a = 3851)	-220°C to +850°C	0.01°C	0.012 % R + 0.06°C	0.03°C	0.014 % R + 0.18°C
Pt100 (a = 3851)	-220°C to +850°C	0.01°C	0.012 % R + 0.05°C	0.02°C	0.014 % R + 0.12°C
Pt100 (a = 3916)	-200°C to +510°C	0.01°C	0.012 % R + 0.05°C	0.02°C	0.014 % R + 0.12°C
Pt100 (a = 3926)	-210°C to +850°C	0.01°C	0.012 % R + 0.05°C	0.02°C	0.014 % R + 0.12°C
Pt200 (a = 3851)	-220°C to +850°C	0.01°C	0.012 % R + 0.12°C	0.10°C	0.014 % R + 0.33°C
Pt500 (a = 3851)	-220°C to +850°C	0.01°C	0.012 % R + 0.07°C	0.03°C	0.014 % R + 0.18°C
Pt1000 (a = 3851)	-220°C to +850°C	0.01°C	0.012 % R + 0.05°C	0.02°C	0.014 % R + 0.08°C
Ni100 (a = 618)	-60°C to +180°C	0.01°C	0.012 % R + 0.03°C	0.01°C	0.014 % R + 0.08°C
Ni120 (a = 672)	-40°C to +205°C	0.01°C	0.012 % R + 0.03°C	0.01°C	0.014 % R + 0.08°C
Ni1000 (a = 618)	-60°C to +180°C	0.01°C	0.012 % R + 0.03°C	0.01°C	0.014 % R + 0.08°C
Cu10 (a = 427)	-70°C to +150°C	0.10°C	0.012 % R + 0.18°C	0.01°C	0.014 % R + 0.10°C
Cu50 (a = 428)	-50°C to +150°C	0.01°C	0.012 % R + 0.06°C	0.03°C	0.014 % R + 0.15°C

Resistive probes measurements in 2, 3 or 4 wires: automatic recognition of number of connected wires, with indication on screen.
Accuracies are given for 4-wire mounted probes.
Take into account particular error of temperature sensor used and implementation conditions.
Temperature coefficient: < 10% of accuracy /°C
Measuring current: 0.25 mA (Measurement) or from 0.1 to 1 mA (Emission)
Settling time: < 1 ms (Simulation on quick transmitters)

Thermocouples: Measurement and simulation

Type	Measurement			Simulation		
	Range	Res	Accuracy / 1 year	Range	Res	Accuracy / 1 year
K	-250 to -200°C -200 to -120°C -120 to -0°C +0 to +1372°C	0.2°C 0.1°C 0.05°C 0.05°C	0.80°C 0.25°C 0.1°C 0.013 % R + 0.08°C	-240 to -50°C -50 to -0°C +0 to +1372°C	0.2°C 0.1°C 0.05°C	0.60°C 0.10°C 0.013 % R + 0.08°C
T	-250 to -200°C -200 to -120°C -120 to -50°C -50 to +400°C	0.2°C 0.05°C 0.05°C 0.05°C	0.70°C 0.25°C 0.10°C 0.013 % R + 0.08°C	-240 to -100°C -100 to -0°C +0 to +400°C	0.2°C 0.05°C 0.05°C	0.40°C 0.10°C 0.013 % R + 0.08°C
J	-210 to -120°C -120 to -0°C +0 to +1200°C	0.05°C 0.05°C 0.05°C	0.25°C 0.09°C 0.013 % R + 0.07°C	-210 to -0°C +0 to +1200°C	0.05°C 0.05°C	0.20°C 0.013 % R + 0.07°C
E	-250 to -200°C -200 to -100°C -100 to -0°C +0 to +1000°C	0.1°C 0.05°C 0.05°C 0.05°C	0.45°C 0.15°C 0.07°C 0.013 % R + 0.05°C	-240 to -100°C -100 to +40°C +40 to +1000°C	0.1°C 0.1°C 0.05°C	0.25°C 0.10°C 0.013 % R + 0.05°C
R	-50 to +150°C +150 to +550°C +550 to +1768°C	0.5°C 0.2°C 0.1°C	0.8°C 0.013 % R + 0.35°C 0.013 % R + 0.2°C	-50 to +350°C +350 to +900°C +900 to +1768°C	0.5°C 0.2°C 0.1°C	0.5°C 0.013 % R + 0.35°C 0.013 % R + 0.2°C
S	-50 to +150°C +150 to +550°C +550 to +1768°C	0.5°C 0.2°C 0.1°C	0.80°C 0.013 % R + 0.35°C 0.013 % R + 0.25°C	-50 to +120°C +120 to +450°C +450 to +1768°C	0.5°C 0.2°C 0.1°C	0.8°C 0.013 % R + 0.35°C 0.013 % R + 0.25°C
B	+400 to +900°C +900 to +1820°C	0.2°C 0.1°C	0.013 % R + 0.4°C 0.013 % R + 0.2°C	+400 to +850°C +850 to +1820°C	0.2°C 0.1°C	0.013 % R + 0.4°C 0.013 % R + 0.2°C
U	-200 to +	0.05°C	0.15°C	-200 to	0.05°C	0.15°C

	60°C			+600°C		
L	-200 to +00°C	0.05°C	0.2°C	-200 to +900°C	0.05°C	0.20°C
C	-20 to + 900°C +900 to +2310°C	0.1°C 0.1°C	0.25°C 0.013 % R + 0.15°C	-20 to +900°C +900 to +2310°C	0.1°C 0.1°C	0.25°C 0.013 % R + 0.15°C
N	-240 to -190°C -190 to -110°C -110 to -0°C +0 to +1300°C	0.2°C 0.1°C 0.05°C 0.05°C	0.5°C 0.15°C 0.08°C 0.013 % R + 0.06°C	-240 to -190°C -190 to -110°C -110 to -0°C +0 to +1300°C	0.2°C 0.1°C 0.05°C 0.05°C	0.3°C 0.15°C 0.08°C 0.013 % R + 0.06°C
Pt	-100 to +1400°C	0.05°C	0.3°C	-100 to +1400°C	0.05°C	0.3°C
Mo	+0 to +1375°C	0.05°C	0.013 % R + 0.06°C	+0 to +1375°C	0.05°C	0.013 % R + 0.06°C
NiMo/NiCo	-50 to +1410°C	0.05°C	0.013 % R + 0.30°C	-50 to +1410°C	0.05°C	0.013 % R + 0.30°C

Accuracy is given for reference @ 0°C.
When using the internal reference junction (except for couple B) add an additional uncertainty of 0.2 °C at 0 °C.
It is possible (except for thermocouple B) to choose by programming the cold junction localization: External at 0°C, internal (temperature compensation of instrument’s terminals) or manually entered.
Temperature coefficient: <10% of accuracy /°C
Display unit: °C and F
Thermocouples G, D: Spécifications on instruction manual available on request

Specifications and performances in pressure @23°C ±5°C>

Pressure: Measurement by external digital sensor



Ranges	0-1 bar	0-3 bar	0-10 bar	0-30 bar	0-100 bar	0-300 bar	0-1000 bar
Absolute	X	X	X	X	X	X	X

Relative	X	X	X	X			

Available in relative, absolute and differential pressure.
Connector: ¼ gas
Resolution: 0.02% FS
Accuracy:
- 0.05% FS from 10 to 40°C
- 0.1% FS from -10 to +10°C and from 40 to 80°C
This digital pressure module ACL433 is connected to CALYS 1000 through RS485 serial cable to the digital input connector. All data are digital. Measurements are compensated in temperature by a polynomial correction implemented into the firmware at factory.

Performances & technical spécifications in process @23°C ±5°C

DC current: Measurement

Range	Resolution	Accuracy / 1 year	Notes
0-20 mA	1 µA	0.0175% RDG + 2 µA	Rin: < 25 Ω With or without loop supply (24 V)
4-20 mA	1 µA	0.0175% RDG + 2 µA	
±50 mA	1 µA	0.0175% RDG + 2 µA	

For measurements of transmitter outputs, special ranges give a dual display using mA and % of full scale..
Temperature coefficient: < 10 ppm/°C beyond reference domain
Loop supply: 24 V ±10%
HART® compatibility: Input impedance Rin = 280 Ω
CALYS 1000 also allows linear or quadratic signals to be linearized.

DC current: Emission

Range	Resolution	Accuracy / 1 year	Note
24 mA	1 µA	0.0175% RDG + 2 µA	With or without loop supply (24 V)
4-20 mA	1 µA	0.0175% RDG + 2 µA	
0-20 mA	1 µA	0.0175% RDG + 2 µA	

Temperature Coefficient < 10 ppm/°C beyond reference domain
Settling time: < 5 ms
Specifications given for CALYS configurations in:
- Active mode (+24V ON) 1 Meter in passive mode (+24 V OFF)
- Passive mode (+24 V OFF) 1 Meter in active mode (+24 V ON)
Pre-programmed steps

0%	25%	50%	75%	100%		
4-20 mA linear		4	8	12	16	20
0-20 mA linear		0	5	10	15	20
4-20 mA quad		4	5	8	13	20

0-20 mA quad	0	1.25	5	11,25	20
4-20 mA valves	3.8-4-4.2		12		19, 20, 21

Direct voltage: Measurement

Range	Resolution	Accuracy / 1 year	Notes
±100 mV	1 µV	0.013% RDG + 3 µV	Rin: > 10 MΩ
±1 V (1)	10 µV	0.013% RDG + 20 µV	Rin: > 10 MΩ (1): -0.8 V to +1 V
±10 V	100 µV	0.015% RDG + 200 µV	Rin: > 1 MΩ
±50 V	1 mV	0.015% RDG + 2 mV	Rin: > 1 MΩ

Rin: input resistancetransmitter
Temperature coefficient: < 7 ppm/°C beyond reference domain

Direct voltage: Emission

Range	Resolution	Accuracy / 1 year	Min Load	Notes
100 mV	1 µV	0.013% RDG + 3 µV	1 kΩ	Iout max: 5 mA
2 V	10 µV	0.013% RDG + 20 µV	2 kΩ	Iout max: 5 mA
20 V	100 µV	0.015% RDG + 200 µV	4 kΩ	Iout max: 25 mA
50 V	1 mV	0.015% RDG + 2 mV	4 kΩ	

Iout: output current from transmitter
Temperature coefficient: < 7 ppm/°C beyond reference domain
Settling time: < 5 ms

Resistance: Measurement

Range	Resolution	Accuracy / 1 year	Notes
400 Ω	1 mΩ	0,012% RDG + 10 mΩ	Meas current: 0.25 mA
4000 Ω	10 mΩ	0,012% RDG+ 100 mΩ	Meas current: 0.25 mA

2, 3 or 4 wires resistance measurement: automatic recognition of number of connected wires, with indication on screen
Accuracies are given for 4-wire mounted probes
Temperature coefficient: < 7 ppm/°C beyond reference domain
Open circuit terminal voltage: < 10 V
Continuity test: Open circuit for R > 1000 Ω and closed circuit for R < 1000 Ω

Resistance: Emission

Range	Resolution	Accuracy / 1 year	Notes

40 Ω	1 mΩ	0.014% RDG + 3 mΩ 0.014% RDG + 10 mΩ	Iext: 10 mA Iext: 1 mA
400 Ω	10 mΩ	0.014% RDG + 20 mΩ 0.014% RDG + 30 mΩ	Iext: 1 / 10 mA Iext: 0.1 / 1 mA
4000 Ω	100 mΩ	0.014% RDG + 300 mΩ	Iext: 0.1 / 1 mA

Temperature coefficient: < 7 ppm/°C beyond reference domain
Current settling time: < 1 ms
Iext : Current received by the calibrator

Frequency and counting: Measurement

Range	Resolution	Accuracy / 1 year
20 kHz	< 0.01 Hz	0.005% RDG

Temperature coefficient: < 5 ppm/°C beyond reference domain
Scale unit: Pulse / min and Hz
Trigger level: 1 V
Measurement on frequency signals or dry contacts
Counting will be performed on defined time or infinite time

Frequency and pulses: Emission

Range	Resolution	Accuracy / 1 year
1000 Hz	0.01 Hz	0.005% RDG
10 kHz	10 Hz	0.005% RDG

Temperature coefficient: < 5 ppm/°C beyond reference domain
Scale unit: Pulse / min and Hz
Pulse emission and dry contact simulation
Max amplitude: 20 V selectable by user

Further functionalities

File Menu	Users can save up to 10 full configurations of the instruments and recall them. Configurations include all programming done on instrument.
Scaling in measurement and simulation modes	Scaling allows process signals to be displayed in % of FS or in all other units. This function also allows sensors to be corrected after a calibration.
Relative measurement	

Models and accessories

Instrument:

CALYS1000 Table documenting multifunction calibrator
Delivered in standard with:

- Quick start manual
- Battery charger
- Set of 6 testing leads
- Factory test report

Accessories:

ACL433 External digital pressure sensor, range to be specified at the order:
Absolute or relative pressure: Range from -1 -> 1; 3; 10; 30 bar
Absolute pressure: Range from -1 -> 100; 300; 1000 bar
ACL9311 Set of 6 measuring cables with removable crocodile clips
ER 49504-000 USB cable

Software:

DATACAL Calibration software for CALYS 1000 / 1200 / 1500
Supplied with USB cable

Certification:

QMA11EN COFRAC certificate of calibration
With all relevant data points where the device has been tested

Packing information:

Size	340 x 245 x 130 mm
Weight	4 kg
Standard delivery	6 weeks