

CALYS 50

Field multifunction calibrator for basic use

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Description

CALYS 50 is a basic 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 and generate over two isolated channels various signals of temperature, resistance, process and frequency in one single instrument.
It provides **extended functionalities** (temperature simulation, scaling, steps, synthesizer, statistical functions...), easily accessible through quick menus by function.
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 IN / 20 V OUT range
- Frequency: Up to 0,005% RDG, 20 KHz range (10 KHz in simulation)

IP 54, fully protected by an antichoc rubber holster, CALYS 50 integrates "easyconnect" terminals and a wide backlite display that makes it easy to use in any severe or dark conditions.

Easy connection system



Connect your probes by simply pushing on the terminal top and insert wires of up to 3 mm or 10 AWG diameter and compensated thermocouple connectors.
Wires are held tight between two brass plates ensuring thermal stability and a very good cold junction compensation for thermocouples.
This system also enables 4 mm banana plugs and security connectors to be connected on the terminal top.

CALYS series, 4 models from basic use to advanced performances

Specifications		CALYS 50	CALYS 75	CALYS 100	CALYS 150
Top accuracy		200 ppm		130 ppm	50 ppm
Temperature accuracy	Thermocouples (14) RTDs (12)	0.013% RDG for Tc K 0.012% RDG		0.01% RDG for Tc K 0.01% RDG	0.005% RDG for Tc K 0.006% RDG
DC current + Loop supply 24 V	Range Accuracy	50 mA 0.0175% RDG			100 mA 0.007% RDG
DC voltage	Range Accuracy	50 V IN / 20 V OUT 0.013% RDG	50 V 0.010% RDG		50 V 0.005% RDG
Frequency	Range Accuracy	20 KHz IN / 10 KHz OUT 0.005% RDG			100 KHz 0.01% RDG
Resistance	Range Accuracy	4000 Ω 0.012% RDG		4000 Ω 0.010% RDG	50 KΩ 0.006% RDG
Pressure	Range Accuracy		Relative pressure: 30 bar / Absolute pressure: 1,000 bar 0.05% RDG		
Compliance to standards					21 CFR Part 11
				NADCAP Heat treatment AMS 2750	
Additional functions		Advanced data exploitation: Scaling, relative measurement, simulation of ramps and steps, synthetizer, square root, statistical functions Transmitter function			
Additional functions			Switch test Calibration of transmitters		
Additional functions				Comparison calibration HART: Digital calibration and data transfer Calibration of thermistors	
Software			DATACAL calibration software for configuration and data management		
Memory			10,000 data stored and recalled on screen as curve or list		

Specifications

Specifications and performances in temperature @23°C ±5°C

Uncertainty is given in % of reading (CALYS 50 display) + fixed value.

Resistive probes: Measurement and simulation

Sensor	Range (Input and Output)	Resolution	Accuracy / 1 year (Measurement)	Accuracy / 1 year (Simulation)
Pt50 (α = 3851)	-220°C to +850°C	0.01°C	0.012% RDG + 0.06°C	0.014% RDG + 0.18°C
Pt100 (α = 3851)	-220°C to +850°C	0.01°C	0.012% RDG + 0.05°C	0.014% RDG + 0.12°C
Pt100 (α = 3916)	-200°C to +510°C	0.01°C	0.012% RDG + 0.05°C	0.014% RDG + 0.12°C
Pt100 (α = 3926)	-210°C to +850°C	0.01°C	0.012% RDG + 0.05°C	0.014% RDG + 0.12°C
Pt200 (α = 3851)	-220°C to +600°C	0.01°C	0.012% RDG + 0.12°C	0.014% RDG + 0.33°C
Pt500 (α = 3851)	-220°C to +8500°C	0.01°C	0.012% RDG + 0.07°C	0.014% RDG + 0.18°C
Pt1000 (α = 3851)	-220°C to +850°C	0.01°C	0.012% RDG + 0.05°C	0.014% RDG + 0.08°C
Ni100 (α = 618)	-60°C to 180°C	0.01°C	0.012% RDG + 0.03°C	0.014% RDG + 0.08°C
Ni120 (α = 672)	-40°C to +205°C	0.01°C	0.012% RDG + 0.03°C	0.014% RDG + 0.08°C
Ni1000 (α = 618)	-60°C to +180°C	0.01°C	0.012% RDG + 0.03°C	0.014% RDG + 0.08°C
Cu10 (α = 427)	-50°C à to 150°C	0.01°C	0.012% RDG + 0.18°C	0.014% RDG + 0.1°C
Cu50 (α = 428)	-50°C to +150°C	0.01°C	0.012% RDG + 0.06°C	0.014% RDG + 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
Measuring current: 0.25 mA (Measurement) or from 0.1 to 1 mA (Emission)
Temperature coefficient: < 10% of accuracy /°C

Thermocouples: Measurement and simulation

Type	Input range	Resolution	Accuracy / 1 year (Measurement)	Output range	Resolution	Accuracy / 1 year (Simulation)
K	-250 to -200°C -200 to -120°C -120 to +0°C 0°C to +1372°C	0.1°C 0.1 0.05°C 0.05°C	0.8°C 0.25°C 0.1°C 0.013% RDG + 0.08°C	-240 to -50°C -50 to -0°C +0°C to +1372°C	0.1°C 0.1 0.05°C	0.6°C 0.1°C 0.013% RDG + 0.08°C
T	-250 to -200°C -200 to -120°C -120 to -50°C -50 to +400°C	0.1°C 0.05°C 0.05°C 0.05°C	0.7°C 0.25°C 0.1°C 0.013% RDG + 0.08°C	-240 to -100°C -100 to -0°C +0 to +400°C	0.1°C 0.05°C 0.05°C	0.4°C 0.1°C 0.013% RDG + 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% RDG + 0.07°C	-210 to -0°C +0 to +1200°C	0.05°C 0.05°C	0.2°C 0.013% RDG + 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% RDG + 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 0.1°C 0.013% RDG + 0.05°C
R	-50 to +150°C +150 to +550°C +550 to 1768°C	0.1°C 0.1°C 0.1°C	0.8°C 0.013% RDG + 0.35°C 0.013% RDG + 0.2°C	-50 to +350°C +350 to +900°C +900 to 1768°C	0.1°C 0.1°C 0.1°C	0.5°C 0.013% RDG + 0.35°C 0.013% RDG + 0.2°C
S	-50 to +150°C +150 to +550°C +550 to +1768°C	0.1°C 0.1°C 0.1°C	0.80°C 0.013% RDG + 0.35°C 0.013% RDG + 0.25°C	-50 to +120°C +120 to +450°C +450 to +1768°C	0.1°C 0.1°C 0.1°C	0.8°C 0.013% RDG + 0.35°C 0.013% RDG + 0.25°C
B	+400 to +900°C +900 to +1820°C	0.1°C 0.1°C	0.013% RDG + 0.4°C 0.013% RDG + 0.2°C	+400 to +850°C +850 to +1820°C	0.1°C 0.1°C	0.013% RDG + 0.4°C 0.013% RDG + 0.2°C
U	-200 to +660°C	0.05°C	0.15°C	-200 to +600°C	0.05°C	0.15°C

L	-200 to +900°C	0.05°C	0.2°C	-200 to +900°C	0.05°C	0.2°C
C	-20 to +900°C +900 to 2310°C	0.1°C 0.1°C	0.25°C 0.013% RDG + 0.15°C	-20 to +900°C +900 to 2310°C	0.1°C 0.1°C	0.25°C 0.013% RDG + 0.15°C
N	-240 to -190°C -190 to -110°C -110 to +0°C +0 to +1300°C	0.1°C 0.1°C 0.05°C 0.05°C	0.5°C 0.15°C 0.08°C 0.013% RDG + 0.06°C	-240 to -190°C -190 to -110°C -110 to +0°C +0 to +1300°C	0.1°C 0.1°C 0.05°C 0.05°C	0.3°C 0.15°C 0.08°C 0.015% RDG + 0.06°C
Platinum	-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% RDG + 0.06°C	+0 to +1375°C	0.05°C	0.013% RDG + 0.06°C
NiMo/NiCo	-50 to +1410°C	0.05°C	0.013% RDG + 0.30°C	-50 to +1410°C	0.05°C	0.013% RDG + 0.3°C

Thermocouples: D and G, for specifications, refer to the instruction manual (Available on request)
Accuracy is given for reference @ 0°C.
When using the internal reference junction (except couple B) add an additional uncertainty of 0.2 °C at 0 °C.
It is possible (thermocouple B excepted) 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

Specifications and performances in process @23°C ±5°C

DC current: Measurement

With or without loop supply

Range	Res.	Accuracy / 1an	Rin
0-20 mA	1 µA	0.0175% RDG + 2 µA	< 25 Ω
4-20 mA	1 µA	0.0175% RDG + 2 µA	< 25 Ω
±50 mA	1 µA	0.0175% RDG + 2 µA	< 25 Ω

Temperature coefficient: < 10 ppm/°C beyond reference domain
Loop supply: 24 V ±10%
HART® compatibility: Input impedance Rin = 280 Ω
Display with linear or quadratic scaling

DC voltage: Measurement

Range	Res.	Accuracy / 1an	Rin
100 mV	1 µV	0.013% RDG + 3 µV	> 10 MΩ
1 V (1)	10 µV	0.013% RDG + 20 µV	> 10 MΩ
10 V	100 µV	0.015% RDG + 200 µV	> 1 MΩ
50 V	1 mV	0.015% RDG + 2 mV	> 1 MΩ

Temperature coefficient < 7 ppm/°C beyond reference domain
(1) Specification domain: -0.8 V to +1 V

Frequency, counting: Measurement

Range	Resolution	Accuracy / 1an
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.

Resistance: Measurement

Range	Resolution	Accuracy / 1an
400 Ω	1 mΩ	0.012% RDG + 10 mΩ
400 Ω	10 mΩ	0.012% RDG + 100 mΩ

Resistance measurement 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
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
Measurement current: 0.25 mA

DC current: Emission

With or without loop supply

Range	Resolution	Accuracy / 1an
24 mA	1 µA	0.0175% RDG + 2 µA
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

DC voltage: Emission

Range	Res.	Accuracy / 1an	Min load
100 mV	1 µV	0.013% RDG + 3 µV	1 kΩ
2 V	10 µV	0.013% RDG + 20 µV	2 kΩ
20 V	100 µV	0.015% RDG + 200 µV	4 kΩ

Noise: 3 ppm (for 0.1 Hz to 10 Hz) and 5 ppm (for 10 Hz to 100 Hz)
Temperature coefficient: < 7 ppm/°C beyond reference domain
Settling time: < 5 ms

Frequency, pulse: Emission

Range	Resolution	Accuracy / 1an
1000 Hz	0.01 Hz	0.005% RDG
10 kHz	0.1 Hz	0.005% RDG

Temperature coefficient < 5 ppm/°C beyond reference domain

Resistance: Emission

Range	Res.	Accuracy / 1an	Nota Iext
40 Ω	1 mΩ	0.014% RDG + 3 mΩ 0.014% RDG + 10 mΩ	10 mA 1 mA
400 Ω	10 mΩ	0.014% RDG + 20 mΩ 0.014% RDG + 30 mΩ	10 mA 1 mA
4000 Ω	100 mΩ	0.014% RDG + 300 mΩ	0.1 / 1 mA

Temperature coefficient: < 5 ppm/°C beyond reference domain
Current establishing time: < 1 ms
Iext: Current received by the calibrator

Further features

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:

CALYS50 On-site documenting multifunction calibrator
Delivered in standard with:

- User manual
- Battery charger
- Set of 6 testing leads
- Carrying strap
- Factory test report

Accessories:

AN6050 Transport case for CALYS series
ACL9311 Set of 6 measuring cables with removable crocodile clips
ER 49504-000 USB cable

Certification:

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

Packing information:

Size 210 mm x 110 mm x 50 mm
Weight without packing 900 g