CALYS 75

On-site multifunction calibrator

Simultaneous Measurement and Generation
Rugged Construction for on-site use
Easy connection system
Measurement Data Recording

Designed in close collaboration with industrial users, CALYS 75 integrates all the necessary functions for adjustment and maintenance of process.

Its ergonomic design and its embedded software allow CALYS 75 to be a high performance calibrator and very easy to use.
IP 54, rated and fully protected by an anti-shock sheath, with integrated "easy-connect®" terminals and its high contrast backlit display for use in all lightning conditions

Its elastomer keypad protects it from dirt and grease marks and the raised keys allow use CALYS 75 with gloves. It has 10 user programmable working configurations for ease of use with repetitive jobs.

CALIBRATION

CALYS 75: Introduction

CALYS 75 is a portable calibrator able to measure and to generate simultaneously on 2 isolated channels.
It has a wide backlit display to be used in all lightning conditions.
Fully protected by the **sheath** with a polycarbonate keypad to protect it from dirt. The raised keys ease use when wearing protective gloves.
It is able to measure and generate voltage, current, frequency, resistance signals, resistive probes and thermocouples. Unit also measures pressure when used with optional external pressure modules.

Anti-shock sheath   "easy-connec®t" terminals   External digital pressure sensor connection

Navigator

Power supply
USB connector

Wide backlighted screen

Protected by polycarbonat

Alphanumerical keyboard

Calys 75 is delivered in standard with a strap and a stand for desktop use, a quick battery charger, and a set of 6 measuring cables with crocodile clips

Main characteristics

Display: Backlight display with contrast settings
USB Connection
Recommended ambient conditions: 0 to 50°C, 10to 80% relative humidity
Maximum ambient conditions: -10 to 55°C. 10 to 80% relative humidity
Infress protection rating: IP 54
Rechargeable NiMH Batteries
Dimensions: 210X110X50 mm (8.3x4.3x2.0 in.)
Weight: 200g (7 Oz.)
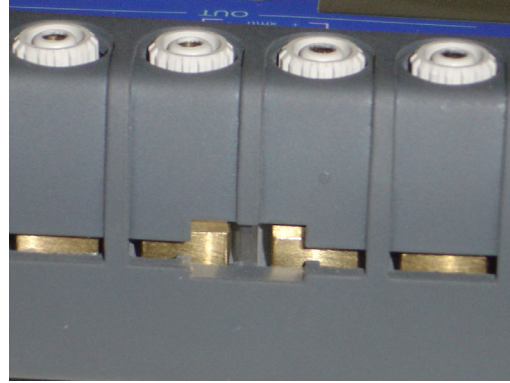
CALIBRATION

"easy connect®" System

This unique system is used by pushing on the terminal's top and inserting:
- Wires with a diameter up to 3 mm or 10AWG
- Compensated thermocouple connectors,

and by releasing.
Wires are held tight between 2 brass plates which provide thermal stability to create a very good cold junction compensation for thermocouples.

This system allows 4mm banana plugs and also security connectors to be connected on the front panel.

Display resolution:

CALYS 75 has user adjustable resolution to allow measurement to meet specific testing requirements.

Functions:

CALYS 75 allows the following physical values to be measured and simulated:

- **Voltage**
- **Current**
- **Resistance**
- **Temperature by resistive probes and thermocouples**
- **Pressure measurement when used with optional external pressure module (simulation requires user supplied pressure pump)**

It allows scaling of process signals and corrections to temperature probes.

It is compatible with HART transmitters by inserting a 250ohms resistance which digital data transfer uninterrupted
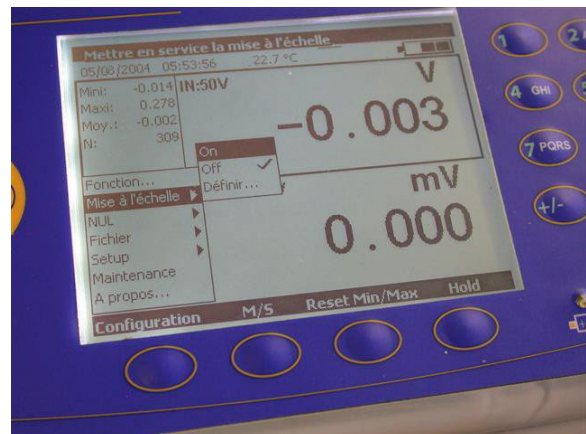
Display

CALYS 75 dual display continuously displays the measurement value, the emitted value, the gauge and the used functions.
On the toplines date, time and external temperature are indicated.
During measuring average, maximum, minimum and the number of measurements are displayed on the left. during 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 graphically display probe connections an wires

CALIBRATION

Functions and performances:@23°C ±5°C

Accuracies are given in % of reading(CALYS 75 display) + fixed value

Direct current: Measurement

CALYS 75 is able to measure up to 50 mA, with or without loop power supply (24V power supply).

Range	Resolution	Accuracy / 1yr	Remarks
±50mA	1 µA	0,018%R + 2 µA	Rin < 25 Ω

For measurements of transmitters outputs, special ranges give a dual display using mA and % of full scale.

Calys 75 also allows to linearize following linear or quadratic signal.

In current measurement Hart compatibility can be selected to measure currents coming from Hart protocol transmitters

DC current: Emission

Range	Resolution	Accuracy / 1yr
24mA	1 µA	0,018%R + 2 µA

Emission with or without loop supply (24V)

Preprogrammed steps

	0%	25%	50 %	75%	100%
4-20mA linear	4	8	12	16	20
0-20mA liear	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

Direct voltage: Measurement

Range	Resolution	Accuracy / 1yr	Remarks
±100mV	1 µV	0,013%R + 3 µV	Rin > 10 MΩ
±1V	10 µV	0,013%R + 20 µV	Rin > 10 MΩ
±10V	100 µV	0,015%R + 200 µV	Rin = 1MΩ
±50V	1 mV	0,015%R + 2 mV	Rin = 1MΩ

Rin: input resistance

Direct voltage: Emission

Range	Resolution	Accuracy / 1yr	Remarks
100mV	1 µV	0,013% R+ 3 µV	Load 1KΩ
2V	10 µV	0,013% R+ 30 µV	Load 2KΩ
20V	100 µV	0,015% R+ 300 µV	Load 4KΩ

Frequency and counting: Measurement

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

Threshold triggering: 1V
Unit 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 time.

Frequency and pulses: Emission

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

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

Resistance: Measurement

Range	Resolution	Accuracy / 1yr	Remarks
400 Ω	1 mΩ	0.012% R+ 10 mΩ	Measurement current = 0.25 mA
4000 Ω	10 mΩ	0.012% R+ 100 mΩ	Measurement current = 0.25 mA

2, 3 or 4 wires resistance measurement :automatic recognition of number of connected wires, with indication on screen

Resistance: Emission

Range	Resolution	Accuracy / 1yr	Remarks
400 Ω	10 mΩ	0.014% + 30 mΩ	Iext from 0.1 to 10 mA
4000 Ω	100 mΩ	0.014%R + 300 mΩ	Iext from 0.1 to 1 mA

Resistance emission: establishing time <1ms for compatibility with smart transmitters type

Pressure: using optional external digital pressure module

Range	0-1 bar	0-3 bar	0-10 bar	0-30 bar	0-100 bar	, 0-300 bar	0-1 000 bar
Absolue	X	X	X	X	X	X	X
Relative	X	X	X	X			

Resolution :0,02 % of full scale.
Accuracy : 0,05 % of full scale between 10 and 40°C; - 0,1 % of full scale between - 10 + 10°C and 40 to 80°C.

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Temperature

Resistive probes: Measurement and emission

Probe type	Range	Resolution Measurement	Accuracy / 1yr Measurement	Resolution Emission	Accuracy / 1yr Emission
Pt 50(α = 3850)	- 220°C + 1 200°C	0,01°C	0,012 % R+ 0,06°C	0,03°C	0,014 % R+ 0,18°C
Pt 100 (α = 3850)	- 220°C + 1 200°C	0,01°C	0,012 % R+ 0,05°C	0,02°C	0,014 % R+ 0,12°C
JPt 100 (α = 3916)	- 200°C + 510°C	0,01°C	0,012 % R+ 0,05°C	0,02°C	0,014 % R+ 0,12°C
Pt 100 (α = 3926)	- 210°C + 850°C	0,01°C	0,012 % R+ 0,05°C	0,02°C	0,014 % R+ 0,12°C
Pt 200 (α = 3851)	- 220°C + 600°C	0,01°C	0,012 % R+ 0,12°C	0,10°C	0,014 % R+ 0,33°C
Pt 500 (α = 3850)	- 220°C + 1 200°C	0,01°C	0,012 % R+ 0,07°C	0,03°C	0,014 % R+ 0,18°C
Pt 1 000 (α = 3851)	- 220°C + 1 200°C	0,01°C	0,012 % R+ 0,05°C	0,02°C	0,014 % R+ 0,08°C
Ni 100 (α = 618)	- 60°C + 180°C	0,01°C	0,012 % R+ 0,03°C	0,01°C	0,014 % R+ 0,08°C
Ni 120 (α = 672)	- 40°C + 205°C	0,01°C	0,012 % R+ 0,03°C	0,01°C	0,014 % R+ 0,08°C
Ni 1 000 (α = 618)	- 60°C + 180°C	0,01°C	0,012 % R+ 0,03°C	0,01°C	0,014 % R+ 0,08°C
Cu 10 (α = 427)	- 70°C + 150°C	0,1°C	0,012 % R+ 0,18°C	0,01°C	0,014 % R+ 0,10°C
Cu 50 (α = 428)	- 50°C + 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

- 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)

Thermocouples: Measurement and Emission

Type	Measurement Range	Measurement Resolution	Measurement Accuracy / 1 yr	Emission OUT range	Emission Resolution	Emission Accuracy / 1 yr
K	- 250 to - 200°C - 200 to - 120°C - 120 to - 0°C + 0 to + 1 372°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 + 1 372°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 + 1 200°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 + 1 200°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 + 1 000°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 + 1 000°C	0,10°C 0,10°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 + 1 768°C	0,5°C 0,2°C 0,1°C	0,80°C 0,013 % R +0,35°C 0,013 % R + 0,2°C	- 50 to + 350°C + 350 to + 900°C + 900 to + 1 768°C	0,5°C 0,2°C 0,1°C	0,5°C 0,013 % R + 0,35°C 0,013 % R + 0,20°C
S	- 50 to + 150°C + 150 to + 550°C + 550 to + 1 768°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 + 1 768°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 + 1 820°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 + 1 820°C	0,2°C 0,1°C	0,013 % R + 0,4°C 0,013 % R+ 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 + 2 310°C	0,1°C 0,1°C	0,25°C 0,013 % R+ 0,15°C	- 20 to + 900°C + 900 to + 2 310°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 + 1 300°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 + 1 300°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
PI	- 100 to + 1 400°C	0,05°C	0,3°C	- 100 to + 1 400°C	0,05°C	0,3°C
Mo	0 to + 1 375°C	0,05°C	0,013 %R + 0,06°C	0 to + 1 375°C	0,05°C	0,013 %R + 0,06°C
NiMo /NiCo	- 50 to + 1 410°C	0,05°C	0,013 %R + 0,30°C	- 50 to + 1 410°C	0,05°C	0,013 %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 thermocouple typeB:

- 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.

Additional functions

File Menu:
User can save up to 10 full configurations of the instruments and recall them. Configurations can be saved and recalled by user or use. Configurations include all programming done on instrument.

Contrast adjustment:
Screen's contrast can be adjusted as needed to fit with measurement environment.

Screen Backlighting:
Time of backlighting can be programmed to save battery.

Battery life:
8 hours minimum.

Scaling:
In measurement and simulation, 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:
- Programming of a reference value different from the one of the instrument (NUL function).
- Subtracting of constant value by measuring or programming it from a measured value(TARE function).

Square root:
In current measurement and simulation, this function allows taking into account a quadratic signal coming from transmitter of type ΔP.

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

Transmitters tests:
Transmitters can be verified using user procedures. 20 procedures can be stored as well as test results. Deviation curves are displayed.
Test reports editing.

Simulation Menu:
Simulation value is set by entering value on keypad or by changing the specific 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 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, CALYS 75 allows curve generation to be remade.
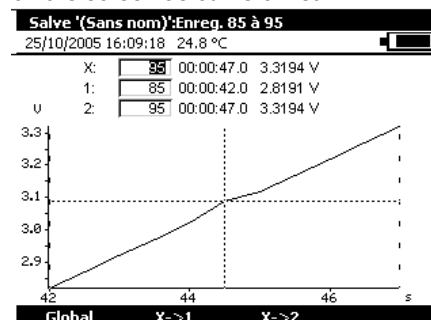
Transmitter function:
CALYS 75 is able to be used as a transmitter. Measurement input is copied on the output with scaling.

Switch test:
In temperature or pressure CALYS 75 can control electronic thermostats and pressostats trigger levels.

Memory
CALYS 75 can record data automatically or on user request. 10 000 data can be stored and displayed on the screen as curve or list

Ordering instructions:

Onsite calibrator	CALYS 75	Digital pressure sensor	ACL 433
Transportation case	ACL 6050	(Precise range when ordering)	