memocal certo

Multifunction Documenting Process Calibrator

- Accuracy ±0.01% rdg for all TC's and RTD's
- Complies with AMS2750 (secondary standard)
- Light, Rugged and Ergonomic for Field Use, with Anti-shock rubber case
- Push & Lock, TC and 4 mm Industrial Plug Connection
- Dual Channels High Accuracy Thermometer
- Programmable Tasks
- In-Line Digit Setting
- Large Graphic Backlighted Display
- Simultaneous Measure and Simulation for TRX Calibration
- Real-Time Clock with Memory for In-Field Calibration Procedures ("as found" + "as left")
- Software for Automatic Calibration and Documenting in Compliance with ISO9001

ERO ELECTRONIC

Memocal$_{certo}$
Multifunction Calibrator

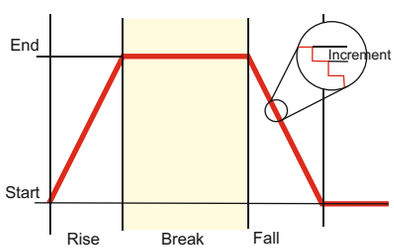
The memocal certo (Documenting Process Calibrator) is a hand tool for calibration maintenance and trouble shooting of virtually all the control process instrumentation.

The memocal certo series features:

- Calibrate temperature, pressure, current dc, voltage dc, frequency and resistance
- Dual channel display for simultaneous measure/source
- Measure and source 14 type of thermocouple and 10 RTD's
- 24 Vdc loop power supply
- Hold, zero, scale, Minimun, Maximum and Average
- Automatic Ramp/Step with programmable Time, Step and Soak
- Supports customized PRT's curve for enhanced temperature measurement
- Documenting capabilities using DataCal software Package
- Scalable 4-20 mA measure/source into effective engineering unit

Programmable generator

- Autoramp and Autostep capability with Start, End, and Step programmable parameters
- Single and continuous cycle with Start, End, Rises, Soaks, and Falls programmable parameters
- the signal value setting uses a unique in-line single-digit setting mode or a direct numeric entry
- direct keypad access to n.10 programmable memory stored values



Built-in calculator

A special calculator function is integrated in memocal certo. You can read the value from the input channel, operate on it, and then write the result on the output channel. All standard math functions are included.

Multichannel Data logging

The calibrator can be used as a multichannel datalogger for electrical and temperature signals. The graphic mode allows you to display the trend; the Replay function allows you to generate the electrical signal using the data stored. The DataCal PC software allows the data storage in the hard-disk.

Switch Test

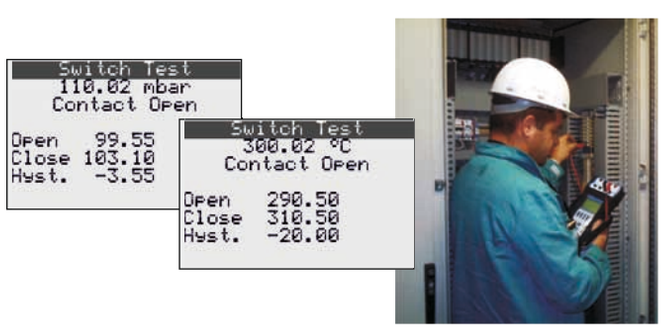
Temperature and signal switches can be tested using this advanced procedure. The calibrator will hold the display reading when the contact changes status.

Transmitter simulation program

The instrument can be used as a temporary signal converter replacement. Any input signal (electric or pressure) can be converted into a 4-20 mA output.
The galvanic insulation between the input and output channels allow also to use of this feature on the process.

Task

The memocal certo can store and recall up to 10 complete instrument configurations. By pressing 2 keys only you can store or recall the configuration of both the channels and the display (including input and output values too). In this way the work on field is simpler and quicker.



Transmitter Calibration

The memocal certo can be configured to easily manage the check and the calibration of any pressure and temperature transmitter. The wide display lets you simultaneously display the input and output values and to select the right units for the transmitter under test.
The current or voltage reading can be scaled/converted in % of span or in the engenieristic unit to simplify the verification operations. The measuring circuit is also able to power the loop for a direct connection with the transmitter under test.
All the memocal certo capabilities let the calibrator useful for all the checks and calibration activities.

Software

Our software has been designed to be used in industries, where there are both laboratory and maintenance on field needs. It is a Windows™ software designed to plan, manage and document all the calibrations and the certifications of the process instrumentation.

Modular for a Total Flexibility

memocal certo

LCD Graphic Display

Large display with text and graphic capabilities.
The rugged LCD is protected by a polycarbonate window from scratches and impacts.

2 Channels

Dual simultaneous IN/OUT channels.
mV, V, mA (active and passive loop), TCs, 3/4w RTDs, Frequency, Pulse.
High accuracy, high repeatability and low drift.

Three operative modes: measure, simulate and measure/simulate

Keypad

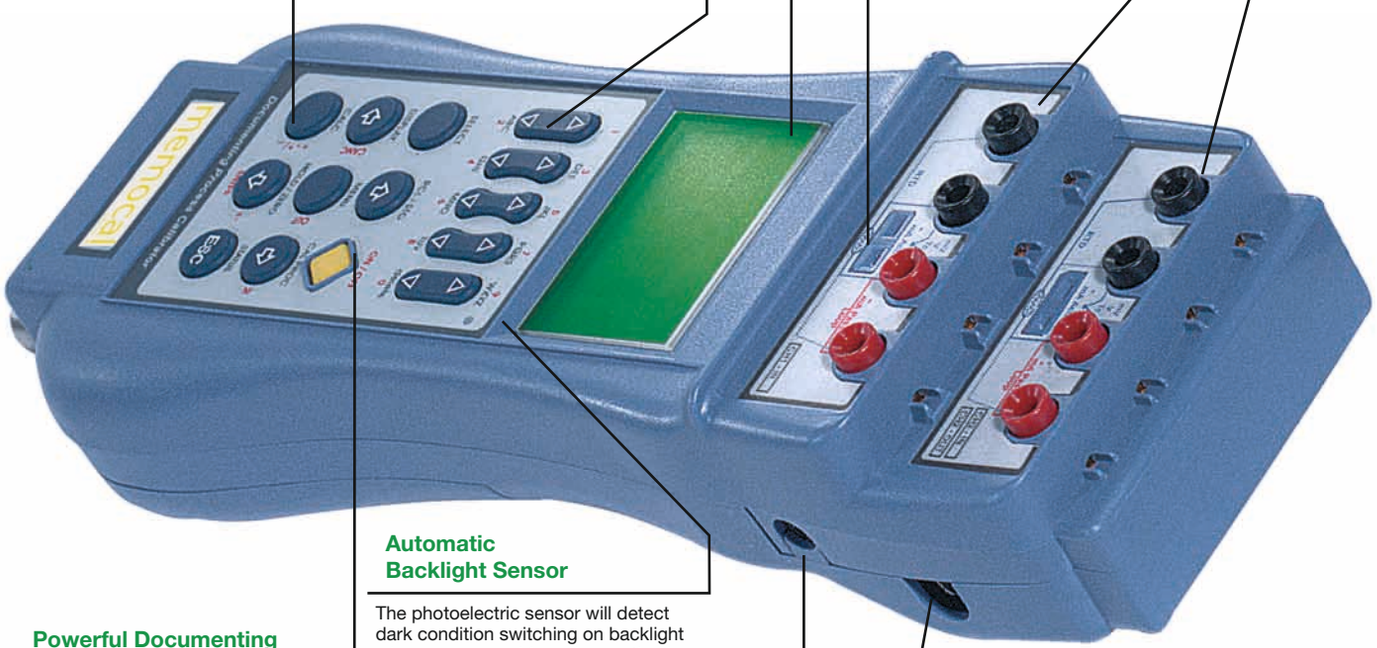
19 key sealed rubber keypad, for direct access to the main functions of the instrument.

Direct Up/Down Keys

5 dedicated keys for directly increase/decrease the value of the output signal.

Mini-DIN TC Connector

Isothermic binding post for TC's with Rj compensation.



Automatic Backlight Sensor

The photoelectric sensor will detect dark condition switching on backlight when necessary. Manual operation is also available.

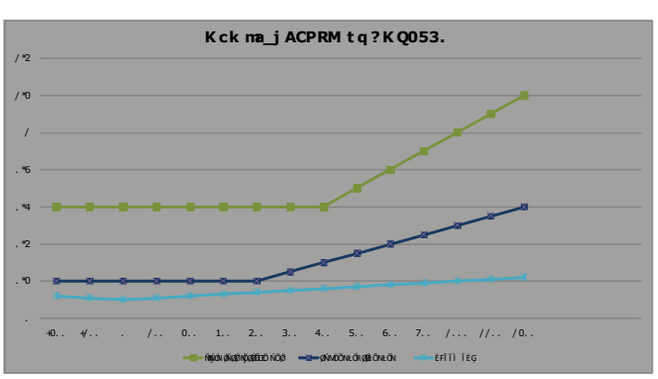
Powerful Documenting Capability

Only ONE KEY to enter in Calibration Procedure Mode.
Select the TAG and run the calibration procedure. All procedure data are loaded from the PC and the Calibration report can be downloaded to the PC with our software.

Battery Charger

RS232 interface

Capabilities	Memocal CERTO
mA, V, T/C's, RTDs, Hz, W	•
Measure/Source	•
Basic Accuracy (rdg)	**±0.01%**
Dual Channel Display	•
Loop P.S.	•
Documenting capability	•



Memocal certo
Multifunction Calibrator

Specifications

Report of Calibration
Each memocal certo is factory calibrated and certified against our Standards, which are periodically certified by an Internationally recognised Laboratory to ensure traceability, and shipped with a Report of Calibration stating the nominal and actual values and the deviation errors.

Firmware
The firmware is stored on a flash memory and allows a fast and easy upgrade of the instrument using the USB cable and the STFlash software.

Over-Voltage protection
The unit is equipped with an advanced system including thermal fuse (auto repair, do not need replacement), high voltage suppressor and resistor-diode voltage limiter.

EMC Conformity
The instrument fulfils the prevision of the directive 2004/108/CEE Electromagnetic Compatibility.

Measure or Source Voltage
Input impedance:
>10 MW for ranges up to 2000 mV f.s.
>500 kW for ranges up to 20 V f.s.
Output impedance (emf output):
less than 0.5Ω with a maximum current of 0.5 mA
Output noise (at 300 Hz):
<2 µVpp for ranges up to 200 mV f.s.,
<10 µVpp for ranges up to 2000 mV f.s.
<80 µVpp for ranges up to 20 V f.s.

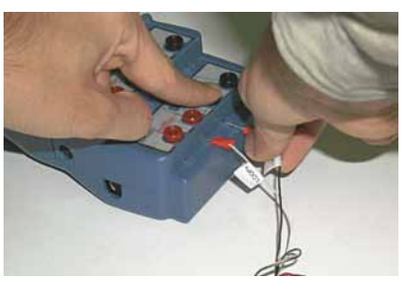
Measure or Source Current
Input impedance: <20 Ω at 1 mA
Maximum load resistance:
1000Ω at 20 mA
Loop Supply: 24V ± 5%

Measure or Source Resistance and RTDs
Connections: 2, 3 and 4 wires
Source resistance effects: ±1 µV error for 1000Ω source resistance
Rtd and Ω simulation excitation current: from 0.100 to 4 mA without incremental error
Rtd and Ω measurement excitation current: 0.2 mA
Rtd cable compensation: up to 100 mΩ (for each wire)
Rtd cable compensation error (Pt100): ±0.005°C/Ω of total wire
Maximum load resistance: 1000Ω at 20 mA

Measure or Source Thermocouples
Engineering unit: °C/°F/K selectable
Resolution: 0.01°C / 0.01°F
Temperature scale: ITS90 and IPTS68 selectables
Reference junction compensation:
internal automatic from -10 °C to +55 °C
external adjustable from -50 °C to +100 °C
Rj compensation drift: ± 0.002°C/°C (from -10 °C to +45 °C) - Class A Pt100
Input impedance (Tc ranges): >10 MΩ

Frequency
Input impedance: >500KΩ

"Push & Lock" binding posts
The multi-connection binding posts is an exclusive project designed to connect the calibrator in a simpler and faster way.



The 3 different connection system available are:
- Standard 4 mm industrial plugs
- Mini isothermic TC's connectors
- Push & Lock system for wires

Advanced Functions
Calculation functions: hold, max, min, offset, zero, average
In/Out data memory: 10 data with manual or automatic recall
Convert function: displays the electrical equivalent of the engineering unit
Scale factor: setting with zero and span programmable within -399999 and +999999
Square root: in combination with scale factor

General Specifications
Calibration: self learning technique with automatic procedure
Channel 1-Channel 2 insulation: 250 Vdc
Common mode rejection: 140 dB at ac operation
Normal mode rejection: 60dB at 50/60Hz
Display: graphic LCD display with automatic and manual backlight device
Measurement sampling time: 250 ms
Digital interface: full bidirectional RS232
Power supply: external charger and rechargeable Ni-MH battery
Battery life (typical):
10h on Tc and mV input/output (backlight Off)
4h with 20 mA simulation (backlight Off)
Recharging time (typical): 5h at 90% and 6h at 99% with instrument switched off.
Battery charge indication: bar graph on the LCD display (flashing on charge)
Line operation: 100V - 120V - 230V - 240Vac with the external battery charger
Line transformer insulation: 2500 Vac
Operating environment temperature range: from -10°C to +55°C
Storage temperature range: from 0°C to +60°C (excluding batteries)
Humidity: max 95%RH non condensing
Case: Injection moulded policarbonate case
Sealing: IP54
Weights: nett 1.4 Kg gross 2.5 Kg
Dimensions: 290x98x57 mm

Multifunction Calibrator for Documenting the Verification and the Certification activity

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Ranges and Accuracy

Measure or Source	Range	Resolution	Accuracy Memocal CERTO
Tc J	-210 to 1200°C	0.01 °C*	±(0.01% rdg. + 0.1°C) (1)
	-350 to 2200°F	0.01 °F	±(0.01% rdg. + 0.2°F) (1)
Tc K	-270 to 1370°C	0.01 °C*	±(0.01% rdg. + 0.1°C) (2)
	-454 to 2500°F	0.01 °F	±(0.01% rdg. + 0.2°F) (2)
Tc T	-270 to 400°C	0.01°C*	±(0.01% rdg. + 0.1°C) (2)
	-454 to 760°F	0.01 °F	±(0.01% rdg. + 0.2°F) (2)
Tc R	-50 to 1760°C	0.1°C	±(0.01% rdg. + 0.2°C) (3)
	-60 to 3200°F	0.1°F	±(0.01% rdg. + 0.4°F) (3)
Tc S	-50 to 1760°C	0.1°C	±(0.01% rdg. + 0.2°C) (3)
	-60 to 3200°F	0.1°F	±(0.01% rdg. + 0.4°F) (3)
Tc B	50 to 1820°C	0.1°C	±(0.01% rdg. + 0.3°C)
	140 to 3310°F	0.1°F	±(0.01% rdg. + 0.6°F)
Tc C	0 to 2300°C	0.1°C	±(0.01% rdg. + 0.2°C)
	32 to 4170°F	0.1°F	±(0.01% rdg. + 0.4°F)
Tc G	0 to 2300°C	0.1°C	±(0.01% rdg. + 0.3°C)
	32 to 4170°F	0.1°F	±(0.01% rdg. + 0.6°F)
Tc D	0 to 2300°C	0.1°C	±(0.01% rdg. + 0.3°C)
	32 to 4170°F	0.1°F	±(0.01% rdg. + 0.6°F)
Tc U	-200 to 400°C	0.1°C	±(0.01% rdg. + 0.1°C) (1)
	-330 to 760°F	0.1°F	±(0.01% rdg. + 0.2°F) (1)
Tc L	-200 to 760°C	0.1°C	±(0.01% rdg. + 0.1°C) (1)
	-330 to 1400°F	0.1°F	±(0.01% rdg. + 0.2°F) (1)
Tc N	-270 to 1300°C	0.1°C	±(0.01% rdg. + 0.1°C) (2)
	-450 to 2380°F	0.1°F	±(0.01% rdg. + 0.2°F) (2)
Tc E	-270 to 1000°C	0.1°C	±(0.01% rdg. + 0.1°C) (2)
	-450 to 1840°F	0.1°F	±(0.01% rdg. + 0.2°F) (2)
Tc F	0 to 1400°C	0.1°C	±(0.01% rdg. + 0.1°C)
	32 to 2560°F	0.1°F	±(0.01% rdg. + 0.2°F)
Pt100 IEC	-200 to 850°C	0.01°C	±(0.01% rdg. + 0.05°C)
OIML, α=.3926	-330 to 1570°F	0.01 °F	±(0.01% rdg. + 0.09°F)
Pt100	-200 to 650°C	0.01°C	±(0.01% rdg. + 0.05°C)
α=.3902	-330 to 1210°F	0.01 °F	±(0.01% rdg. + 0.09°F)
Pt100	-200 to 600°C	0.01°C	±(0.01% rdg. + 0.05°C)
JIS SAMA	-330 to 1120°F	0.01 °F	±(0.01% rdg. + 0.09°F)
Pt200	-200 to 850°C	0.1°C	±(0.01% rdg. + 0.15°C)
	-330 to 1570°F	0.1°F	±(0.01% rdg. + 0.27°F)
Pt500	-200 to 850°C	0.1°C	±(0.01% rdg. + 0.1°C)
	-330 to 1570°F	0.1°F	±(0.01% rdg. + 0.2°F)
Pt1000	-200 to 850°C	0.01°C	±(0.01% rdg. + 0.1°C)
IEC OIML	-330 to 1570°F	0.01°F	±(0.01% rdg. + 0.2°F)
Cu10	-70 to 150°C	0.1°C	±(0.01% rdg. + 0.4°C)
	-100 to 310°F	0.1°F	±(0.01% rdg. + 0.7°F)
Cu100	-180 to 150°C	0.1°C	±(0.01% rdg. + 0.05°C)
	-300 to 310°F	0.1°F	±(0.01% rdg. + 0.09°F)
Ni100	-60 to 180°C	0.1°C	±(0.01% rdg. + 0.05°C)
	-80 to 360°F	0.1°F	±(0.01% rdg. + 0.09°F)
Ni120	0 to 150°C	0.1°C	±(0.01% rdg. + 0.05°C)
	32 to 310°F	0.1°F	±(0.01% rdg. + 0.09°F)
mV	-20 to 200mV	1µV	±(0.01% rdg. + 3 µV)
V	-0.2 to 2V	10µV	±(0.01% rdg. + 10 µV)
	-2 to 20V	100µV	±(0.01% rdg. + 100 µV)
mA	0 to 50mA**	0.1µA	±(0.01% rdg. + 0.4µA)
mA (IN CH1)	-5 to 50mA	0.1µA	±(0.01% rdg. + 0.4µA)
Ω (IN)	0 to 500Ω	10mΩ	±(0.01% rdg. + 12mΩ)
	0 to 5000Ω	100mΩ	±(0.01% rdg. + 120mΩ)
Ω (OUT)	0 to 500Ω	10mΩ	±(0.01% rdg. + 20mΩ)
	0 to 5000Ω	100mΩ	±(0.01% rdg. + 200mΩ)
Frequency	1 to 200 Hz	0.001Hz	±(0.005% rdg.+0.001Hz)
	1 to 2 kHz	0.01Hz	±(0.005% rdg.+0.01Hz)
	1 to 20 kHz	0.1Hz	±(0.005% rdg.+0.1Hz)
Pulse	0 to 10^6	1 count	

NOTES:
The relative accuracies shown above are stated for 360 days and the operative conditions are from 18 to 28°C.
Typical 2 year relative accuracy can be estimated by multiplying the "% of reading" specifications by 1.4.
All input ranges: additional error ±1 digit.
Stated accuracies for Tcs only valid with wire connections (Push & Lock) and standard banana connectors. Not always valid for measures with mini DIN Tc connectors.

Factory traceability chart and uncertainty can be supplied on request.
* Resolution is 0.1°C with temperature lower than -200°C.
** 21mA max on passive current loop

(1) up to -100°C (-148°F) the accuracy is ± 0,02% rdg +0,1°C (+0,2°F)
(2) up to -170°C (-274°F) the accuracy is ± 0,02% rdg +0,1°C (+0,2°F)
(3) up to 0°C (+32°F) the accuracy is ± 0,02% rdg +0,2°C (+0,4°F)

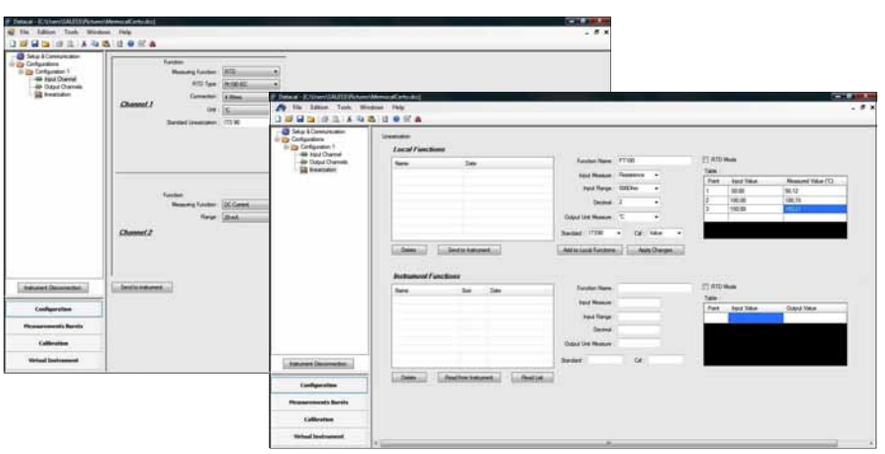
Memocal certo
Multifunction Calibrator

DataCal Software

The DataCal software provides a comprehensive solution to the calibration requirements. It is easy to use, compliant to ISO9001 requirements and generates traceable and editable calibration documents. The four main functional areas are:

- Instrument configuration
- Measurement burst
- Paperless calibration procedures
  Virtual instrument

Instrument Configuration



The instrument can be configured using DataCal interface:

- **Input channel:** quantity measured, type of sensors, scale, scaling value, display parameters, unit
- **Output channel:** quantity measured, period, start point
- **Linearization:** name, type, unit, calibration values

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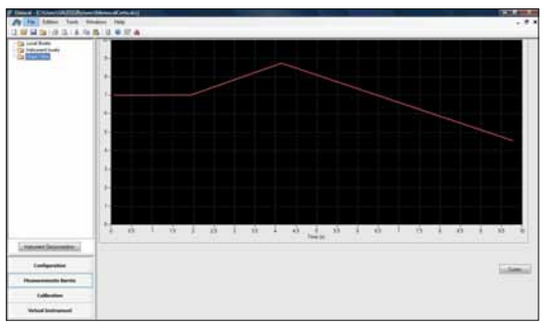
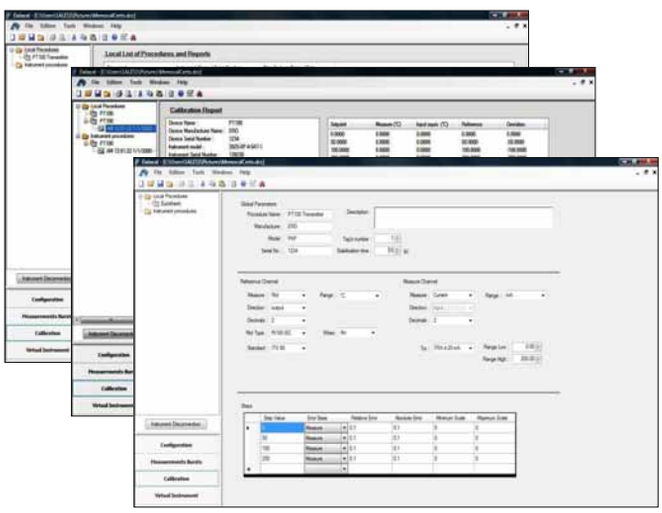
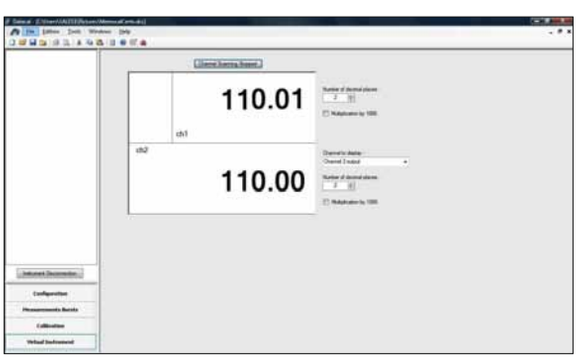
Measurement Bursts

This function allows to download logged data from internal memory to PC. Data can be saved on disks, showed in table and graph view, loaded from disks, exported in Excel format file.



Calibration

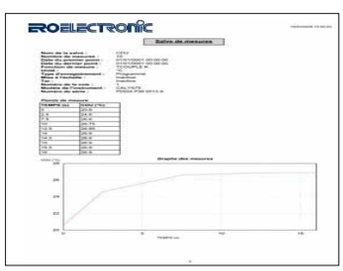




Paperless calibration procedures

Create multi-parameter automatically run calibration procedures directly with DataCal and define:

- calibration method
- channels
- accuracy
- measurement and simulation
- advanced control of the test point



After the instrument calibration, the report is sent back to DataCal for processing and shaping.

Virtual Instrument

For real-time visual control use the Virtual Instrument to:
- display real-time measures
- immediately detect mistakes

Memocal certo
Multifunction Calibrator


memocal certo with portable leather bag

Ordering Codes

MEMCERTO	Calibrator with ISO Calibration Certificate
MEMCERTOKIT1	Test Leads Kit for electrical signals
IG031478	Portable Leather Bag
MEMLAT1PNT	Calibration Certificate of Accredited Laboratory
MEMCERTOSW	MemocalCerto DataCal Software
MEMCERTOUSB	MemocalCerto USB Cable with converter

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