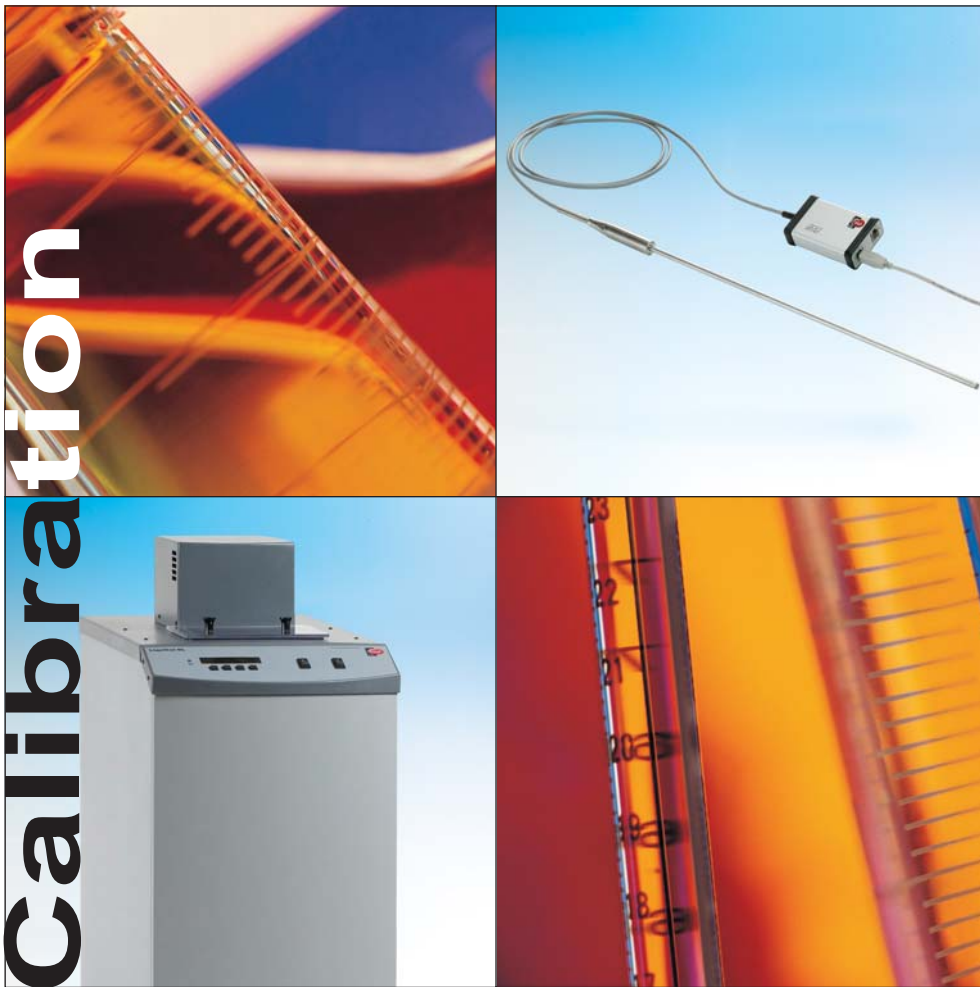


Calibration Solutions



The high performance calibration system for every need

LiquiCal™

LiquiCal™ is a range of high performance liquid baths used for high precision temperature calibrations. The baths can be controlled via PC allowing for automated calibration and ramp control or as a stand alone unit. LiquiCal™ provides high accuracy along with a large immersion depth, high stability, fast temperature change and quiet run.

LiquiCal™ Features

The models cover temperatures from -80 °C to +300 °C all having the same exterior dimensions, bath openings and liquid filling volume except for the micro baths (LiquiCal™ SM/HM) which are far smaller facilitating mobility.

Type	Temperature	Stability	Volume
LiquiCal™-LL	-80 °C to +110 °C	±0.005-0.006	15.9 L
LiquiCal™-SL	-40 °C to +150 °C	±0.005-0.007	15.9 L
LiquiCal™-HL	+40 °C to +300 °C	±0.007-0.010	15.9 L
LiquiCal™-SM	-20 °C to +140 °C	±0.03-0.05	0.8 L
LiquiCal™-HM	+35 °C to +200 °C	±0.02-0.03	1.0 L



System overview

Complete Automated Solution

The LiquiCal™ baths can be integrated with Ellab Temperature Standard (ETS) and Valsuite Pro calibration and validation software for complete automated calibration and control. The software will control the ramp, stability time and automatically calibrate Ellab's data logging equipment.

On LiquiCal™ SL, HL and LL a convenient overflow reservoir captures any excess fluid that results from fluid expansion. The bath's 15.9 L (4.2 gallon) tank can easily be emptied by drain when needed.

Liquids for LiquiCal™ baths

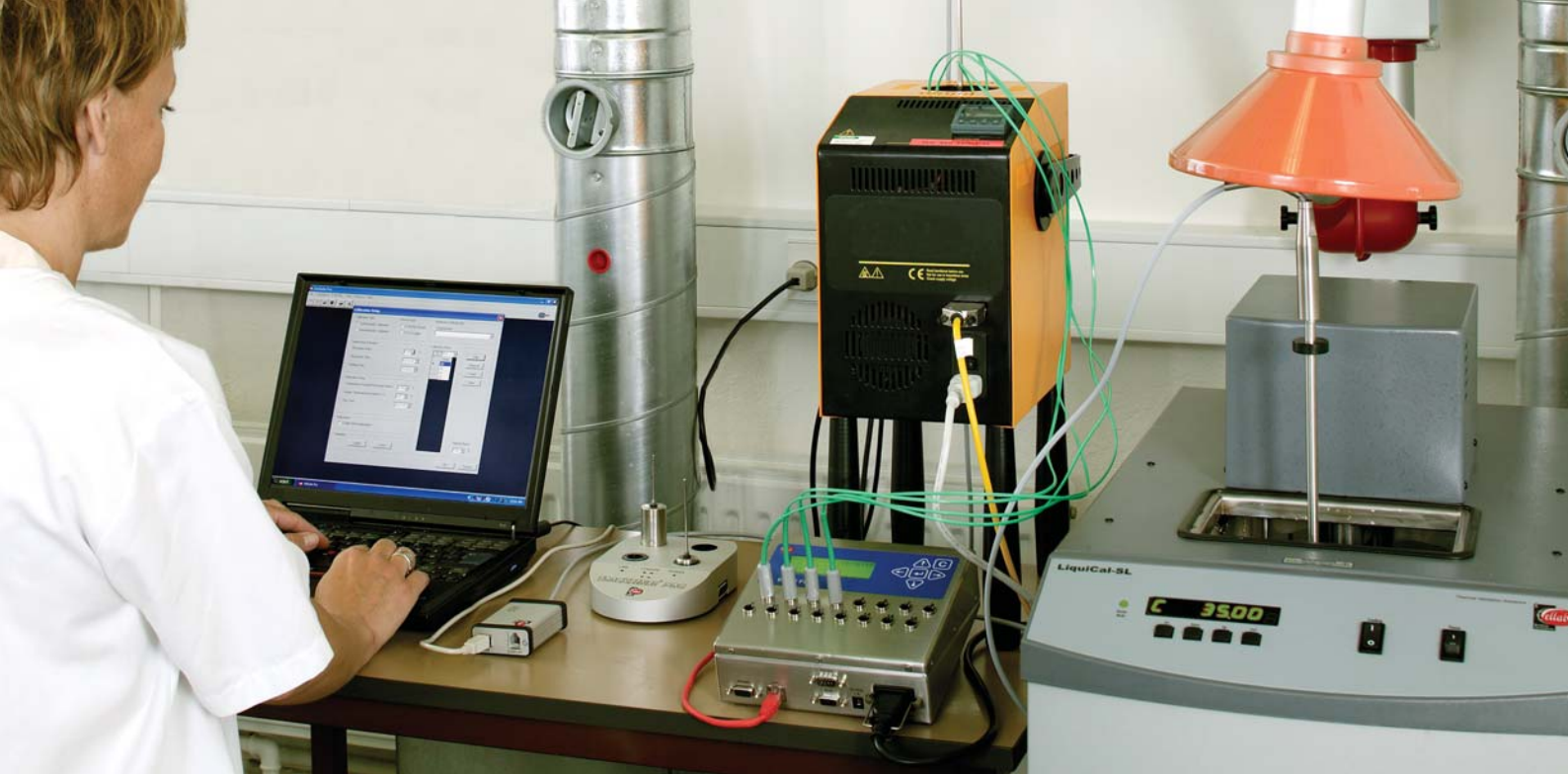
To obtain optimal temperature stability and homogeneity in the calibration zone liquids with the lowest possible viscosity (<25 CST) are preferred. Ellab supplies a range of liquids in 3.8 L (1 gallon) containers covering the temperature range of -80 °C to +300 °C safely.

Type	Temperature
Ellab Low Temperature Liquid	-80 °C to +5 °C
Ellab Standard Oil	-30 °C to +200 °C
Ellab High Temperature Oil	+80 °C to +300 °C

One Bath / One Oil - Concept

Using Ellab Standard Oil within a temperature range of -30 °C to +150 °C together with LiquiCal™ SL or SM bath, you will be able to cover most validation applications, including:

- Sterilization using autoclaves and retorts.
- Pasteurization using plate heat exchangers.
- Testing using environmental chambers.
- Chilling using refrigerators.
- Storing using freezers.



Complete calibration set-up facility.

Dryblock Solutions

When calibration at temperatures up to +400 °C is required, and when mobility is needed, a transportable Ellab Dryblock system is available. A stable temperature profile is created using a controlled and heated aluminum block, which is equipped with wells to fit the sensors/probes being used. Please note that you cannot expect the same high performance as with liquid baths due to this design.

Ellab Temperature Standard

Traceable ETS allows extremely accurate temperature calibration. ETS is available in 3 different versions and comes with calibration certificates traceable to NPL. The ValSuite™ Pro software with the ETS and the LiquiCal™ provides an automatic setup, which simplifies the calibration system and saves time. Furthermore an optional ETS Display unit as well as ETS Suite graphical software for stand alone use is available providing read out and/or data-collection and export facility.

Type	Temperature	Accuracy
ETS10	-80 °C to +250 °C	±0.011 °C / 0.025 °C
ETS20	-50 °C to +150 °C	±0.02 °C
ETS25	-196 °C to +420 °C	±0.025 °C



Ellab Temperature Standard

ValSuite™ Pro Software

ValSuite Pro Software allows semi or full-automatic pre and post calibration of cable probes or wireless loggers. Using the intuitive menus all data necessary for software calibration

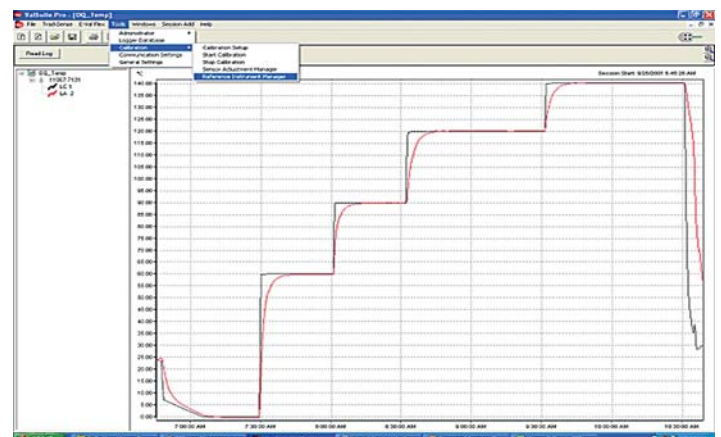
is processed, generating offset values that are stored in the software. For TrackSense® Pro wireless loggers and E-Val Flex intelligent cable probes a firmware calibration routine is recommended on a regular basis, and user alert can be programmed into the memory for smart handling.

Calibration Set-up

Ellab calibration software uses a point-to-point method and can handle multiple points using only interpolation. When choosing semi-automatic calibration only an ETS is connected. In a full-automatic calibration both the ETS and LiquiCal™ bath are in operation. The following performance criteria can be set:

- Maximum allowed calibration bath fluctuation band and time.
- Holding time.
- Max allowed temperature standard fluctuation.
- Maximum sensor temperature deviation and pass time.

All setup conditions and acceptance criteria together with actual values and deviations are shown in the calibration report.



Typical ValSuite Pro software calibration graph.

Ellab

Software Managing Tools

ValSuite Pro features two different calibration management tools:

- Reference Instrument Management (RIM).
- Sensor Adjustment Management (SAM).

Based on a database RIM keeps track of used equipment in your calibration routines i.e. instrument type, serial number, manufacturer, calibration date, calibration expiry and certificate number. SAM provides complementary information on previously calibrated E-Val Flex probes and TrackSense[®] Pro sensors. All data is transferred and displayed in the calibration report.

GAMP4 guidelines and DS/EN ISO 9001

All documentation for development of Valsuite[™] Pro software is in accordance with the guidelines set out in GAMP4. Software package includes appropriate documentation and complies with 21 CFR part 11. Ellab quality system is compliant with DS/EN ISO 9001.

Calibration Certifications and Service

Ellab maintains a complete calibration facility for annual certifications and service. All certifications are traceable to NPL and NIST standards. Service and maintenance contracts are available.



Approvals
CE marked.



QUALITY SYSTEM
DS/EN
ISO 9001



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