

ALCTE Automatic LC Tester (Academic Version)



The ALCTE is a low cost version of the ALCT, available only to academic customers and designed especially for them. This version of the ALC provides many features not available to industrial customers, such as a versatile function generator and data acquisition module along with optional photo detector support. The ALCTE is a USB based instrument which can be connected conveniently to both desktop and laptop computers. The ALCTE's easy-to-use software allows for the measurement of both positive and negative dielectric nematic liquid crystal materials. The ALCTE offers the measurement of material parameters for ferroelectric liquid crystals as well. The range of material parameters measured by the ALCTE includes:



For NLC (Positive Dielectric Anisotropic Material):

- Threshold Voltage
- Splay and Bend Elastic Constants
- ϵ_{\perp} and ϵ_{\parallel} Dielectric Constants
- Ion Density and Mobility*
- Electrical Resistivity*
- Rotational Viscosity

For Negative Dielectric Anisotropic Nematic Material:

- Threshold Voltage
- Splay and Bend Elastic Constants
- ϵ_{\perp} and ϵ_{\parallel} Dielectric Constants
- Ion Density and Mobility*
- Electrical Resistivity*

For FLC:

- Spontaneous Polarization
- Electrical Switching Time
- Optical Switching Time
- Rotational Viscosity
- Ion Density and Mobility*
- Electrical Resistivity*
- Dielectric Constant

*Resistivity and ion density measurement of ALCTE are designed for academic use only. The minimum current measurement is 1nA. For current measurement down to 10pA, please refer to the IV1.

The ALCTE can also be integrated with Instec's microscope thermal stages and temperature controllers. This enables the user to analyze the temperature dependence of the above parameters.

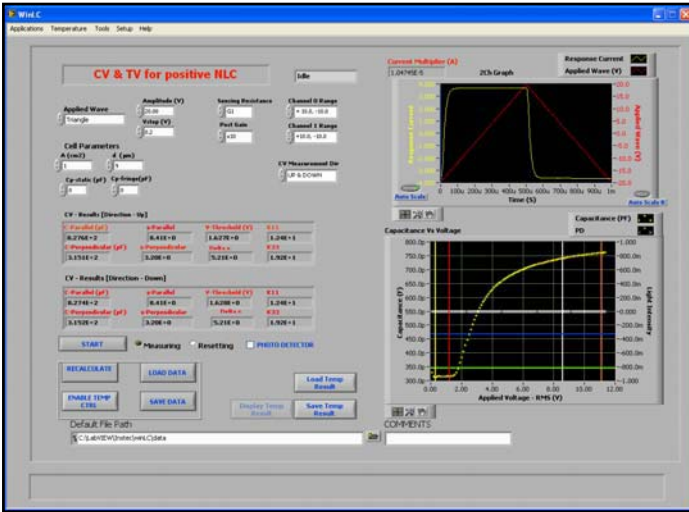
Technical Specifications

Output Wave	DC to 10KHz, voltage 0 to $\pm 100V$
Output Update Rate	500KHz
Output Resolution	16 bit
Input Resolution	16 bit
Input Sample Rate	500KHz
Current Measurement Range	1nA ~ 1mA
Current Sensing Resistance	10K, 100K, 1M, and 10M Ω
Current Resolution	100pA
Post Gain in the ALCT Box	1, 10, 100, 1000
Capacitance Measurement	2pF to 100nF

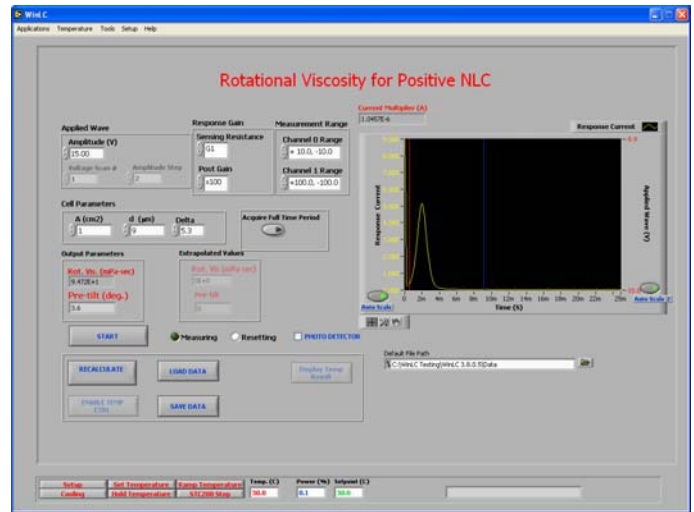
Easy-to-Use Software, WinLCE

The ALCTE's software has been designed to be both flexible and simple to use. For example, when determining the material parameters of a Nematic Liquid Crystal either of two methods may be chosen. In one the user is free to decide exactly what data to be used in the analysis. In the other, the software automatically selects the default values to insure repeatable results over a series of tests.

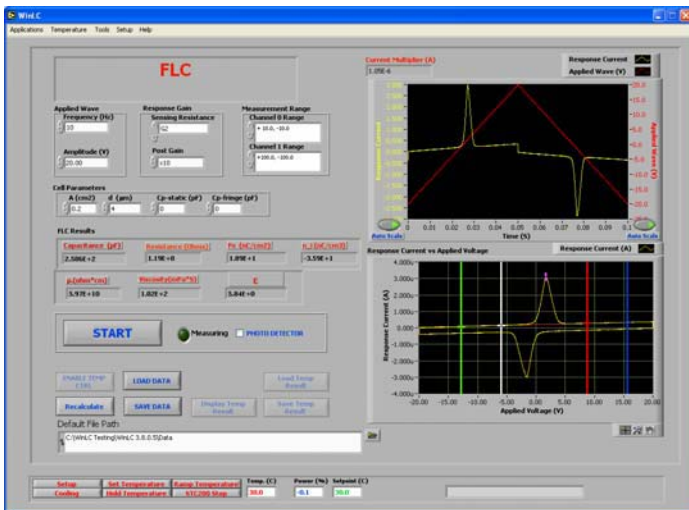
Liquid Crystal Measurement Instruments



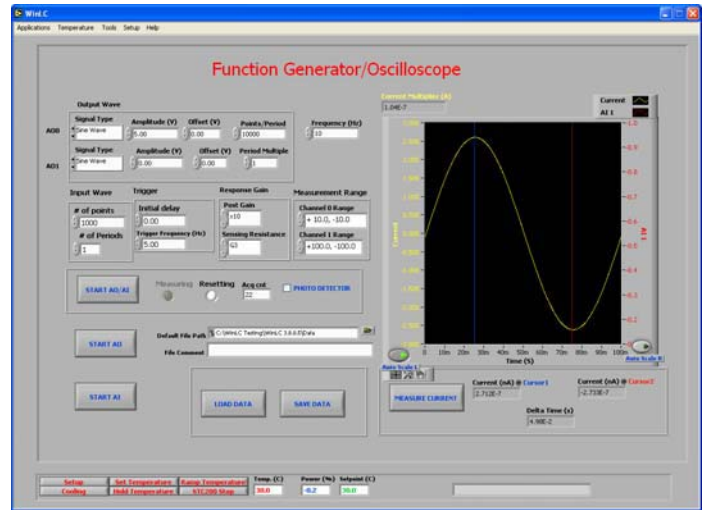
Software Interface for CV Curve of NLC



Software Interface for Gamma1 Measurement (Positive NLC)



Software Interface for FLC Polarization Measurement



Software Interface for Function Generator/Oscilloscope