



Additional Software Options



SpectraWiz LabVIEW

Customizable Programs with Source Codes

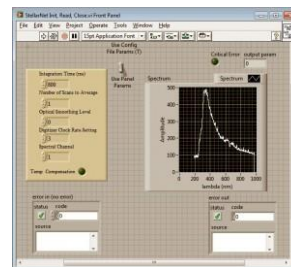
StellarNet provides fully functional customizable spectroscopy programs for National Instruments LabVIEW free with every spectrometer. The LabVIEW programming environment allows rapid customization to adapt the software to any application. Current features include setting of all instrument configuration parameters, plotting of spectral data in Scope mode, Absorbance mode, Transmission mode, and even Irradiance mode. In addition, a time series function is built in that enables the user to select independent wavelengths and follow them as a function of time. This time series data can be exported to file and post-processed for kinetic parameters. In addition to the Spectroscopy Suite, basic VIs are available that allow the user to integrate StellarNet's spectrometer into their existing LabVIEW application.

StellarNet init, read, close.vi

The StellarNet Init, Read, Close.vi is a general-purpose subVI for programming episodic spectral readings in LabVIEW. When called, it:

1. Initializes the instrument using either programmatic parameters or parameters stored on disk by SpectraWiz,
2. Acquires the spectrum, returning it to the calling VI as a graph-ready cluster that includes amplitude and wavelength information, and
3. Checks for error information from the .dll during the scan process, providing this in a LabVIEW-compatible format.

Since it is entirely self-contained, it can be used interactively as well as called as a subVI



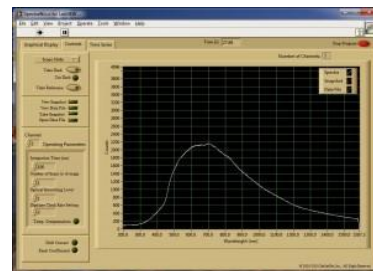
Single Channel

The StellarNet SpectraWiz for LabVIEW spectrometry application is a full spectroscopy program that provides an easy-to-use graphical user interface for any of up to eight StellarNet USB spectrometers plus logging of process data on local or network storage.

It is designed to work independently of the SpectraWiz software utility. Spectrometer calibration parameters are managed by this application, either automatically in the case of BLUE-Wave and other advanced units onboard parameter storage, or manually when the spectrometers are first connected.

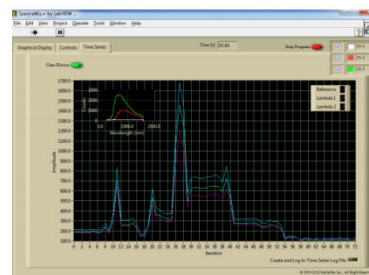
The software utilizes an easy-to-use and space-efficient tabbed-panel design. Data logging and snapshots are supported, and time series may be logged to show changes of three wavelengths of any channel.

The software was entirely coded in LabVIEW 8.2 and interacts with the spectrometers via swdll.dll. In the graphical user interface, spectrometers (channels) are numbered 1-8, consistent with SpectraWiz usage.



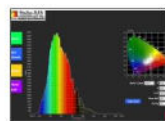
Multi-Channel

LabVIEW Mega Program in LabVIEW ver 7.x & 8.x – controls up to 8 simultaneous spectrometers & radiometers – includes source diagram and is compatible with Wizard-Runtime engine for chemometrics models.

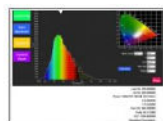


StellarRad Radiometry Program (Handheld unit)

The StellarRAD software is fast, easy-to-use, and specifically designed for a touchscreen tablet. It incorporates live spectra and CIE 1931 color space chromaticity display among other real-time features. Pressing the Capture button will quickly generate a .pdf report that includes the full front panel plus summary information. Press the Snapshot Display button to display a static outline of a spectrum you wish to use as a baseline for comparing other lamps and luminaries in real time. This software is perfect for multi field measurement with quick data capture and easy to view comparison spectra with under the curve color representations.



Large buttons and simplified interface designed for field measurements with beautiful colorimetric displays



One click comprehensive .pdf report generated by the Capture button.



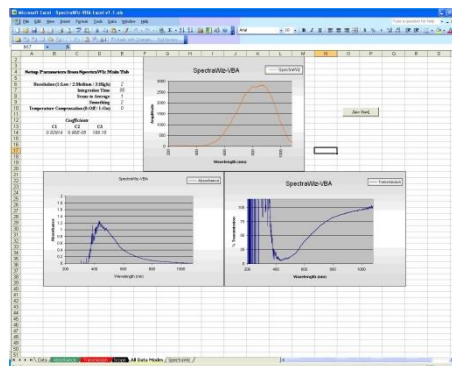
Snapshot button draws an outline of the current spectrum for easy comparison as illumination conditions change. Great feature for showing light quality comparisons!

SpectraWiz VBA

StellarNet also offers the customizable StellarNet VBA programs for MS Excel that instantly grabs and graphs data from a StellarNet spectrometer.

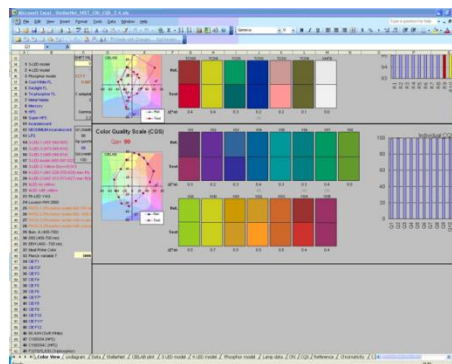
Setup and run from Excel in absorbance, transmission, or scope mode. With our VBA modules, you can rapidly customize your spectral analysis to meet your unique research requirements. You can integrate this module's data acquisition capabilities into your existing analytical spreadsheet, thereby enabling acquisition and analysis of spectral data without leaving the Microsoft Excel environment. Create custom reports, calculate and graph absorbance or percent transmission, all at the push of a button. It's all here and more importantly, it is included free with your StellarNet spectrometer.

Excel's VBA script functionality enables the user to query an instrument directly from Microsoft Excel. Data from the device is imported directly onto an Excel page for post data processing using user defined algorithms. Above is the processed data graphics page of the module. Scope, absorbance, and transmission data is displayed simultaneously.



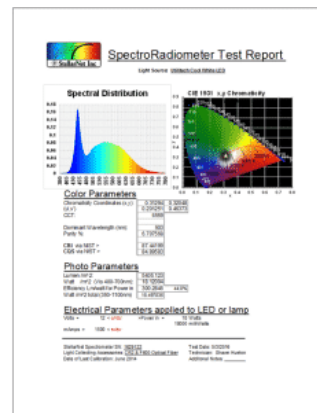
CRI & CQS Software

CRI & CQS calculations are performed in a comprehensive spreadsheet written by the folks at NIST. If you purchase a StellarNet spectrometer we'll send you our free modified version that reads your instrument!



LED Test Report

The SpectroRadiometer Test Report Software now enables customers to display and print all of the relevant test data on one sheet making quality control and R&D efforts much more efficient. The test report also shows the CIE LAB diagram with the xy/u'v' chromaticity values automatically updated for your light. Additionally, CCT (Correlated Color Temperature), PAR, dominant wavelength, and % color purity are calculated. The software also includes NIST created calculations for CRI (Color Rendering Index) and CQS (Color Quality Scale) and total power measurements in Lumens, Watts, or associated irradiance values with efficiency and efficacy values calculated as well based on your input electrical parameters.



Software SDK (C, C#, VB, Pascal)

StellarNet provides with each spectrometer purchase a complete software development toolbox of sample source codes and programs including SwDemo for Delphi Pascal – SwDemo for C# Sharp compiler – SwDemo for C SDK compiler – SwDemo for Visual Basic 5+.

Thin Film Companion

Specialty Software Programs

Thickness and optical constants (n and k) can be measured quickly and easily using powerful user-friendly software which make daily complex measurements quick and simple.

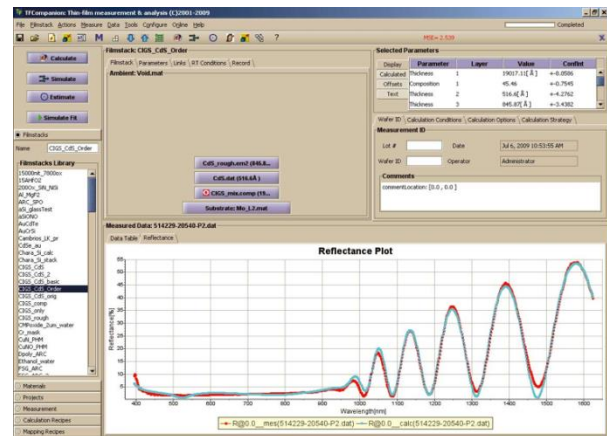
TF software includes a large library of materials data that enables measurement of the wide range of layer structures: multilayer, freestanding, rough, thick and thin layer structures are supported. New materials can be added easily by measuring corresponding sample or importing data from the text file.

The measurement process consists of two steps: data acquisition and data analysis. TF Systems defines all the process in a measurement recipe and makes it transparent to the user. At the same time the user has the ability to store measured data and analyze it later.

TF supports Parameterized materials e.g. Cauchy, Sellmeier, EMA (effective-medium approximation), Harmonic oscillator, Tauc-Lorentz oscillator, Drude-Lorentz and many more approximations. These approximations represent optical dispersion of materials in desired spectral range using few coefficients that can be adjusted. For example, oxides are frequently represented using Cauchy and glasses using Sellmeier approximation, amorphous materials (e.g. SiN_x , aSi) can be represented using Tauc-Lorentz and phase-mixed materials (e.g. poly-Si) using EMA approximation.

Measurements are made using: reflectance/transmittance spectroscopy which measures the optical response of the layer structure. The user creates an optical model of the layer structure and uses data analysis to determine physical properties: the results are inferred from the best fit of measured and modeled data. TF software provides many options to easily analyze simple and most complex filmstacks, graded layers, periodic structures, very thick films, films on thin substrates, multi-sample measurements, etc. Simulation and error-estimator tools allow user better understand data and the expected precision.

During in-situ, in-line or other long running measurements conditions like surface roughness, ambient light, etc. may be changing. TF software supports roughness and scaling correction that allows factoring in these effects.



Spectroscopy Pro-Tools

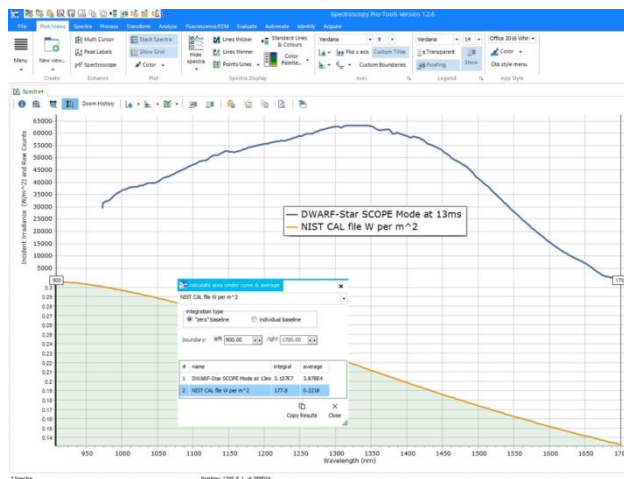
Add-on software for creating amazing interactive multi-spectrum plots, tons of options for spectral processing, and even spectral acquisition.



Spectroscopy Pro-tools software has:

- Advanced baseline correction capabilities which can help adjust your spectra and remove unwanted fluorescence or glass signal
- A variety of color palettes and other customization features (multiple plot windows, drag and drop spectral files, adjust line widths, legend and key text sizes, adjust background grids, hide and remove spectra)
- The ability to label peaks and can normalize to a peak maximum, create peak lists of all loaded spectra, and even create calculated FWHM values
- A lot of great features for Fluorescence Spectroscopy such as emission sensitivity correction, excitation intensity corrections, lamp removal peaks, 2D plots of excitation and emission matrix

Spectroscopy Pro-tools allows you to easily stack multiple spectra and customize for display or publication. To the right is an example of a DWARF-Star NIR spectrometer measuring a calibrated light source. One graph shows the raw SCOPE Mode data in relative counts and the other curve is the calibrated spectral irradiance of the same lamp in Watts/m²/nm. Graphing tools like this give users more control over how their values are interpreted and presented. Area under the curves (integral) can also be calculated and presented per spectrum.

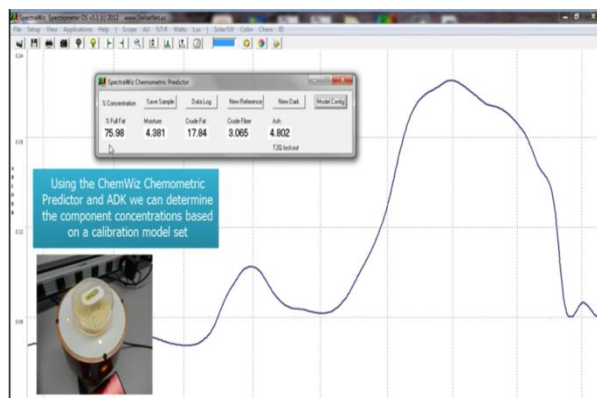


ChemWiz Chemometrics

Full spectrum chemometric analysis for multiple components can now be performed using the ChemWiz® Analyzer Development Kit (ADK). This software toolkit, when combined with StellarNet spectrometer instrumentation and SpectraWiz operating software, enables rapid development of complex analyzers needed to provide custom measurement solutions for many applications.

Real-time spectral data is used as input to measure concentrations of up to 6 components such as moisture, fat, protein, alcohols, acids, or chemicals such as pesticides. Alternatively, the ChemWiz® ADK can be used to classify samples, such as the types of plastic.

The toolkit includes a model builder which is used to process spectra from a set of known component concentrations. Here the spectral pre-processing techniques are selected such as multivariate scatter correction (MSC), smoothing, derivatives, and mean centering. The multivariate analysis type is then selected such as partial least squares (PLS). Finally, a cross validation technique is chosen and used to improve the reported statistics indicating accuracy and fitness of the calibration model created.



The ADK includes a runtime engine that performs the analysis in real-time with little to no sample preparation. The measurement results are displayed on the SpectraWiz Application panel for “Chemometric Predictor” which is also provided in our Multi-Chanel LabVIEW software program for OEM developers.

Each analyzer system can be tailored with sampling accessories to measure liquids, solids, and powders. For liquids, absorbance is measured via flow cells, dip probes, or cuvettes. For solids and powders, reflectance is typically used to measure sample absorbance. Near infrared diode array spectrometers such as the DWARF-Star NIR-512 with TEC cooling are typically configured for analyzer development.

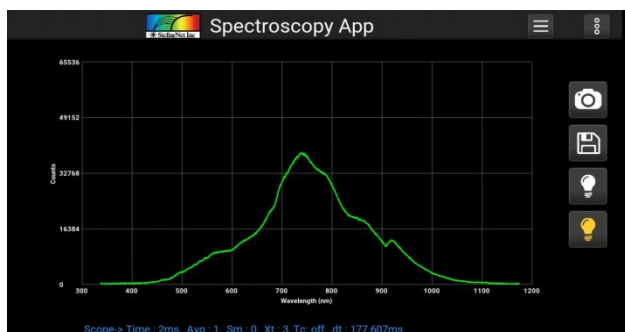
SpectraWiz Mobile Apps

Each **zAP2** and **SMART-Control** includes our latest **SpectraWiz Mobile App** set written in the form of `.bin` files (Linux executable) and *dynamic library* for USB drivers as `stellarnet_driver.so` and `stellarnet.hex` files. We also provide with simple data acquisition script written in *python* (`data.py`) that can communicate with `stellarnet_driver.so` and perform simple operation to set device parameter and acquire spectrum data.

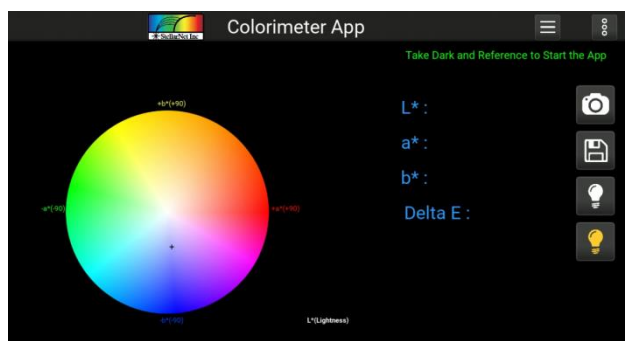
Using the local access point and your own mobile device, you can easily run applications for *General Spectroscopy, Radiometry, Colorimetry, and Concentration analysis*.



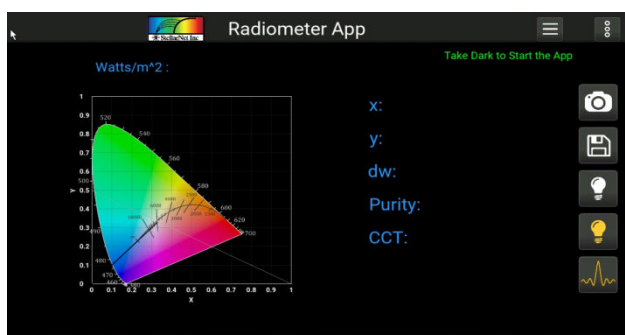
At the startup of each Smart-Control system you will see the home page of SpectraWiz Mobile apps where you can launch the application of your choice by tabbing or clicking corresponding icons.



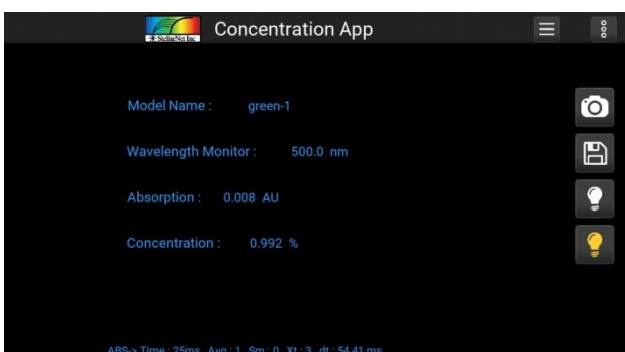
The Spectroscopy app was designed for general spectroscopic visualization in different modes such as *Scope*, *Absorption*, *Transmission* and *Radiometer*. It also has option to take screenshot, save data and export data in various protocols.



Color app is design to give CIELAB D65 reference values for L^* , a^* , b^* in numeric and graphical form. Additionally, it also gives information about x , y chroma and hue.



By click the Radiometer app form the home page you can launch the radiometer app which is design to give x , y , dominant wavelength, purity and correlated color temperature using the radiometer calibration.



Concentration app is designed to use *absorption data* and the *linear model* to give concentration values for the defined wavelengths.

In-app purchases allow users to download source codes, which can be further customized to suite each user's requirements. Using the powerful Python language you can create your own onboard apps to stream only the data you need.

Check out our [SpectraWiz Mobile Apps user manual](#) for more details.