



# Software

Our comprehensive library of data acquisition and display software helps you make the most of your spectroscopic measurements and analysis. No matter what operating system you prefer, chances are excellent that Ocean Optics has the software tool you need.

From analysis to drivers and from spectrometer operation to scripting and development, Ocean Optics software is the ideal partner.



## Tip

You can get the latest updates to your Ocean Optics software online at [www.oceanoptics.com](http://www.oceanoptics.com).

# Software

## Software Overview



# SPECTRASUITE

Our Java-based, modular SpectraSuite software supports a wide variety of operating systems and controls all of our USB devices. Ocean Optics is the first to offer such a robust software package with this level of cross-platform capability.

# SpectraSuite+

We're taking SpectraSuite a step further with the introduction of SpectraSuite+. This next logical step in the evolution of spectrometer software will provide better stability, persistence of user settings, broader scope of device features, and consistent file saving and loading procedures.

# OmniDriver

OmniDriver lets you harness the power of high-speed data acquisition, spectral processing, data analysis, visual data representation and data flow in a single cross-platform driver. OmniDriver is not only platform-independent, but device-independent as well. OmniDriver works with all Ocean Optics USB spectrometers and direct-attach devices.



SPAM is an add-on product for OmniDriver that offers a library of spectral processing functions to manage data from any USB spectrometer – including those from other vendors.

## SpectraSuite

### Spectroscopy on any Operating System

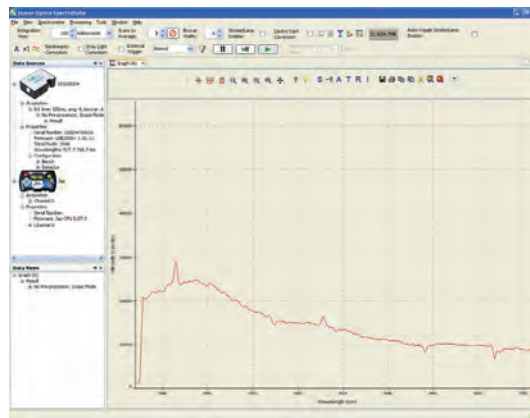
SpectraSuite is a completely modular, Java-based spectroscopy software platform that operates on Windows (both 32- and 64-bit), Mac OS X and Linux operating systems. The software can control any Ocean Optics USB spectrometer and device. The SpectraSuite interface looks and feels the same on all operating systems, yet retains the familiar appearance of an application native to each OS.

### Ultimate USB Spectrometer & Device Control

SpectraSuite easily manages multiple USB spectrometers – each with different acquisition parameters – in multiple windows and provides graphical and numeric representations of spectra from each spectrometer. Using SpectraSuite, you can combine data from multiple sources for applications that include upwelling/downwelling measurements, dual-beam referencing and process monitoring.

### All-in-One SpectraSuite

- Allows you to annotate graphs and to specify format and precision of displayed values
- Displays a color spectrum behind graphs
- Corrects for non-unity for reflection measurements
- Performs reference monitoring
- Displays x-axis in GHz, microns, pixel number, Raman shifts, wavenumbers or nanometers
- Provides an Experiment Wizard that guides users on configuring common experiments
- Acquires data from one spectrometer using different parameters to run multiple experiments
- Stores data in a number of formats such as tab-delimited ASCII (for Excel or other analysis packages) and GRAMS SPC
- Provides Strip Charts using any processing mode (transmission, absorbance, etc.) to track processes, perform kinetic analyses and monitor spectral events -- all as a function of time.
- Allows the addition and configuration of external libraries such as a C function from a DLL or a Java function from a .jar file with the click of a button.



### Features for Reflective & Emissive Color & Absolute Irradiance

- Provides dominant wavelength and wavelength purity
- Calculates reflective or emissive color
- Provides chromaticity diagram of color-space values
- Offers CIE standard illuminants for reflective color (A, B, C, D50, D55, D65, D75, E, F1-F12)
- Calculates CIELAB, XYZ, xyz, u'v'w', hue, chroma, CCT (correlated color temperature), saturation, CRI and more

## SpectraSuite+

### Ready for the Future of Spectroscopy

SpectraSuite+ is our most advanced spectroscopy operating software to date. In addition to all of the great features that you've come to expect from SpectraSuite, SpectraSuite+ adds the following features to an already robust platform:

- Significantly improved threading
- Customizable user-interface that allows you to choose what data you want to display and which items to display on the toolbars and menus
- Language localization
- Allows you to manually save experiment settings (source, processing type, acquisition parameters and data view customization) for later use
- Can perform specialized calculations on spectral and other measurement data, including derivatives and integrals of spectral data; spectral arithmetic; ratio-metric on the same spectrum or between 2 different spectra; and interpolation, subsetting and concatenation of a spectrum
- Support for the following experiments/processing modes:
  - Scope Mode
  - Absorbance
  - Transmission
  - Reflection
  - Absolute Irradiance
  - PARSpec
  - Color
  - Chemical Concentration
  - Spectral Math/Arithmetic
  - Multiple Strip Charts

# Software

## SpectraSuite Technical Details

### Spectroscopic Functions

SpectraSuite allows you to perform the three basic spectroscopic experiments – absorbance, reflectance and emission – as well as absolute irradiance, color and chemical concentration. Signal-processing functions such as electrical dark-signal correction, stray light correction, boxcar pixel smoothing and signal averaging are also included. Scope mode, the spectrometer operating mode in which raw data (signal) is acquired by the detector, allows you to establish these signal-conditioning parameters. The basic concept for the software is that real-time display of data allows users to evaluate the effectiveness of their experimental setups and data processing selections, make changes to these parameters, instantly see the effects and save the data. Most spectrometer-system operating software does not allow such signal-conditioning flexibility.

With SpectraSuite, you can perform time-acquisition experiments for kinetics applications. As part of the time-acquisition function (strip charts), you can monitor and report single wavelengths, and you can average between wavelengths and find the integral between two wavelengths. In addition, you can perform reference monitoring in a variety of ways: single wavelength (1 or 2 channels), integrated intensity (starting and ending wavelengths for 1 or 2 channels) and wavelength-by-wavelength (2 channels).

SpectraSuite gives you complete control of setting the parameters for all system functions such as acquiring data, designing the graph display, and using spectra overlays. SpectraSuite has the benefit of providing various software-controlled triggering options for external events such as laser firing or light source pulsing.

Other advanced features give you several data-collection options. You can independently store and retrieve dark, reference, sample and processed spectra. All data can be saved to disk using autoincremented filenames. You can save data as ASCII files or in the native GRAMS/32 SPC or JCAMP format. One feature prints the spectra and another copies spectral data into other software such as Excel and Word.

### Device Support

SpectraSuite can be used with the following Ocean Optics spectrometers when they are interfacing to a computer through their USB port:

- S2000 Spectrometer (with A/D Converter)
- USB650 Spectrometer
- USB2000 Spectrometer
- USB2000+ Spectrometer
- USB2000-FLG Spectrometer
- USB4000 Spectrometer
- HR2000 High-resolution Spectrometer
- HR2000+High-resolution Spectrometer
- HR4000 High-resolution Spectrometer
- Jaz System
- QE65000 Scientific-grade Spectrometer
- NIR-512 Near-IR Spectrometer
- NIR256-2.1 and NIR256-2.5 Near-IR Spectrometers
- NIRQuest512, 512-2.2 and 512-2.5 Near-IR Spectrometers
- NIRQuest256-2.1 and 256-2.5 Near-IR Spectrometers
- Maya2000 and Maya2000-Pro Spectrometers
- MMS Raman Spectrometer
- ARCOptix ANIR Series FTS Spectrometers

SpectraSuite also supports the following USB devices:

- ADC1000-USB A/D Converter
- Spectral Hyper Adapter (SHA-1)

In addition, SpectraSuite is compatible with the Remora Wi-Fi™ /Ethernet Adapter.

### Operating System Platforms Supported

SpectraSuite provides cross-platform support for the following operating systems:

- Microsoft Windows – Windows XP, Vista and 7; 32-bit and 64-bit
- Linux – Red Hat 9 or later, Fedora (any version), Debian 3.1 or later (Sarge), SUSE (9.0 or later), Centos (any version), and Ubuntu
- Apple Macintosh – OS X version 10.3 or later

### Site License Available

For multiple installations at a single site, we offer a non-transferable site license for an unlimited number of copies of SpectraSuite software. Contact an Applications Scientist for more information.

OmniDriver is a powerful Software Developer's Kit for Windows, Mac and Linux operating systems that allows you to easily write custom software solutions for your Ocean Optics USB spectrometers and direct-attach devices. OmniDriver is the culmination of our best software driver packages; it's developed in Java and includes cross-platform native libraries to offer the following:

## High-Res Timing

Time stamping that is accurate to sub-millisecond performance; great for chemical kinetics and other applications that require complex time accountability.

## LabVIEW Support

OmniDriver provides drivers for LabVIEW (Version 7.1 or greater ) to enable you to configure Ocean Optics spectrometers as real-time virtual instruments in National Instruments' LabVIEW graphical programming environment.

## Support for Ocean Optics USB Spectrometers

- S2000 Spectrometer (with A/D Converter)
- USB650 Spectrometer
- USB2000 Spectrometer
- USB2000+ Spectrometer
- USB2000-FLG Spectrometer
- USB4000 Spectrometer
- HR2000 High-resolution Spectrometer
- HR2000+High-resolution Spectrometer
- HR4000 High-resolution Spectrometer
- Jaz System
- QE65000 Scientific-grade Spectrometer
- NIR-512 Near-IR Spectrometer
- NIR256-2.1 and NIR256-2.5 Near-IR Spectrometers
- NIRQuest512, 512-2.2 and 512-2.5 Near-IR Spectrometers
- NIRQuest256-2.1 and 256-2.5 Near-IR Spectrometers
- Maya2000 and Maya2000-Pro Spectrometers
- MMS Raman Spectrometer
- ARCoptix ANIR Series FTS Spectrometers

**Note: OmniDriver does NOT support PCI or ISA products.**

## Operating System Support

- Windows: Windows XP, Vista, Windows 7 ; 32- and 64-bit
- Mac: OS X 10.5 or later
- Linux: Many x86 distributions are supported, Kernel 2.4.20 and libusb 0.1.10 or later are required

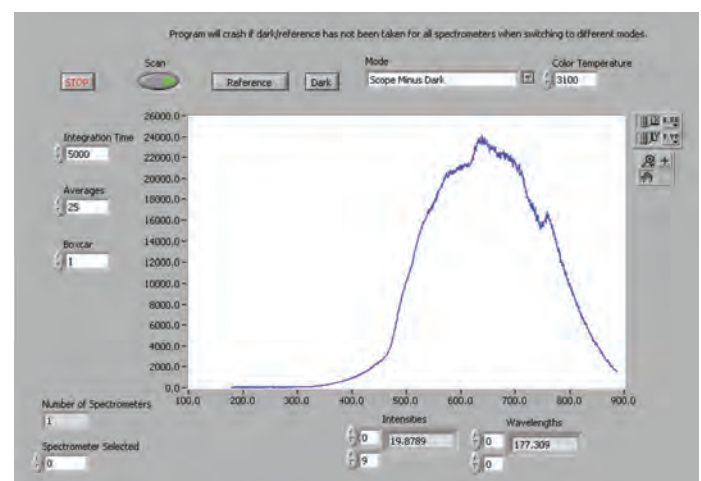
## Measurement Corrections:

- Detector nonlinearity
- Electrical dark (automatic baseline removal)
- Stray light
- Boxcar smoothing (averaging across pixels)
- Averaging multiple scans

## Control of the following extended functions (depending on spectrometer model):

- Strobe enable
- Thermo-electric cooling (TEC), and reading detector and PCB temperatures
- Gated fluorescence mode
- Analog output (4-20 mA current output for LS-450 and soon the AOUT; voltage out for HR4000)
- Analog input for the supported spectrometers (voltage only)
- Digital (TTL) input/output (control of GPIO pins)
- Setting external trigger modes
- Reading out wavelength calibration
- Setting continuous strobe delays

Integrate OmniDriver into your own software application for complete control over USB spectrometers and devices in virtually any OS environment.



# Software

## SPAM Spectral Processing Math

SPAM is the perfect complement to OmniDriver since it features the additional functions needed to perform spectral processing such as peak-finding, radiometric and color analysis, etc. The SPAM library can be used to process spectral data.

### SPAM Features

SPAM provides the following powerful tools for processing your spectral data:

- Scope mode
- Scope minus dark
- Absorbance
- Transmission
- Reflection
- Relative irradiance (with user-specified color temperature)
- Raman (with user-specified wavelength)
- Blackbody and CIE Relative daylight spectrum generators with user-defined color temperature
- Peak finding and metrics (centroid, full width at half max in units of pixels and wavelengths, center wavelength, integral, pixel number, 90% enclosing width)

### Robust Set of Functions

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>- Absolute irradiance</li> <li>- New calibration from lamp files</li> <li>- Photometry</li> <li>- Lumens</li> <li>- Lux</li> <li>- Candela</li> <li>- Luminance</li> <li>- <math>\mu</math>Joule</li> <li>- <math>\mu</math>Watt</li> <li>- <math>\mu</math>Joule/cm<sup>2</sup></li> <li>- <math>\mu</math>Watt/cm<sup>2</sup></li> <li>- dBm</li> <li>- Photons/cm<sup>2</sup></li> <li>- Total photons</li> <li>- Moles of photons</li> <li>- Electron volts</li> </ul> | <ul style="list-style-type: none"> <li>- Color</li> <li>- Reflective and emissive color</li> <li>- Emissive color can use relative or absolute irradiance</li> <li>- CIE 1931 and CIE 1964 observers</li> <li>- CIE Illuminants A, B, C, D50, D55, D65, D75, E (unity), F1-F12</li> <li>- Color spaces</li> <li>- CIE XYZ</li> <li>- x, y, z</li> <li>- Color Rendering Index (CRI)</li> <li>- General CRI Ra</li> <li>- Special CRI R1- R14</li> <li>- Correlated Color Temperature (CCT)</li> <li>- Dominant wavelength and purity</li> <li>- <math>u'v'w'</math>, <math>u,v</math> hue angle, <math>u,v</math> saturation</li> <li>- CIE Whiteness and Tint</li> <li>- CIELAB (<math>L^*a^*b^*</math>, hue angle, chroma)</li> <li>- CIE 1960 <math>u,v</math></li> <li>- Hunter Lab</li> </ul> |
|---|--|

### Measurement Units

- Nanometers
- Microns
- Pixel number
- Gigahertz
- Wave numbers
- Raman shifts

### SPAM Corrections

- Nonunity reference
- Reference Monitoring



# WE EMPOWER YOU



At Ocean Optics, we're not afraid of giving.




As the inventors of the world's first miniature spectrometer, we've spent over 20 years learning everything there is to know about optical sensing and we make sure that our customers and partners benefit from it.

Our Application Blog contains a wide range of application and experiment notes. We produce and publish video tutorials to make using Ocean Optics spectrometers easy and accurate. We share photos of application and experiment setups. And, we even get into social networking – all to make our customers optical sensing super heroes.

## www.oceanoptics.com/social

APPLICATION BLOG - ONLINE SHOP - FACEBOOK - TWITTER - VIDEO TUTORIALS  
PHOTO SHARING - 24 HOUR CHAT SUPPORT

www.oceanoptics.com | info@oceanoptics.com  
+1 727-733-2447

### Identifies Elements & Compounds

SpecLine Software is a powerful tool designed for identifying atomic emission lines and molecular bands in spectral data. SpecLine's advanced evaluation, search, compare and identify functions – and its extensive library of over 100 elements and over 400 compounds – enable you to quickly identify unknown lines, peaks and bands. SpecLine was designed for scientists, engineers and researchers using emission spectroscopy in fields such as astrophysics, the plasma sciences and plasma processing.

### Searching and Comparing Data

In the Line Identification window, you can define all the parameters for your search in a Periodic Table screen (top right), and begin the process with just a single click. SpecLine can analyze even the most complex spectral data, including spectra with double lines, line shoulders and complex band structures. Up to 12 separate spectra, even if they are in different file formats, can be combined for comparative purposes.

### Identification

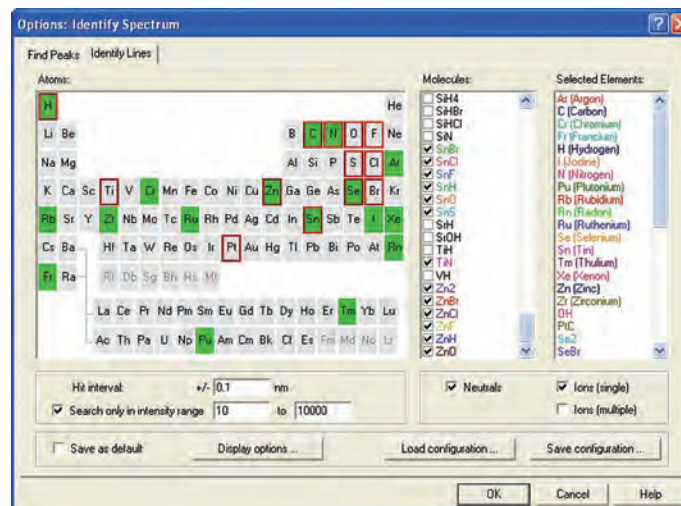
SpecLine applies a variety of sophisticated filter functions such as Wiener-Fourier and polynomial noise removal to identify the elements and compounds in your spectra. After SpecLine applies comparative searches to its extensive atomic, ionic and molecular database of over 100 elements in several ionization states and over 400 elemental compounds, it provides detailed data on each identified peak and line, such as the name of the element, the peak's wavelength, the electron voltage and its transition state and quantum number.

### Opening Spectra & Saving Data

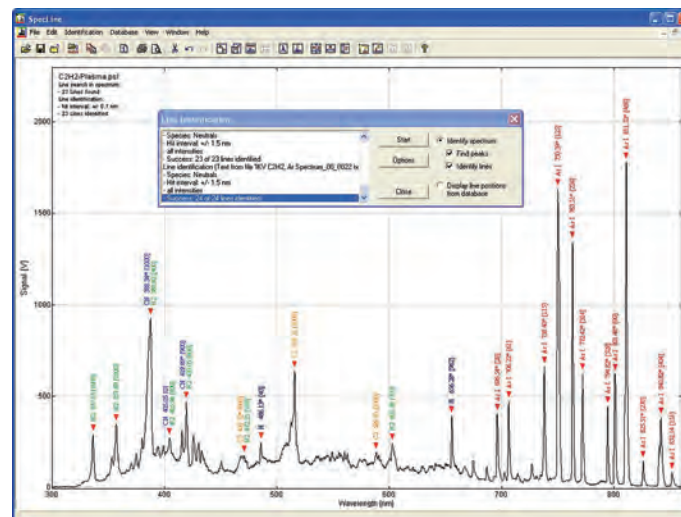
SpecLine can analyze spectral data from various spectroscopy software applications; it also can open all Ocean Optics software file formats as well as SPC and ASCII file formats. In addition, you can save all of SpecLine's identification data in its native file format or export it into various applications, such as Excel.

### Hardware Keys

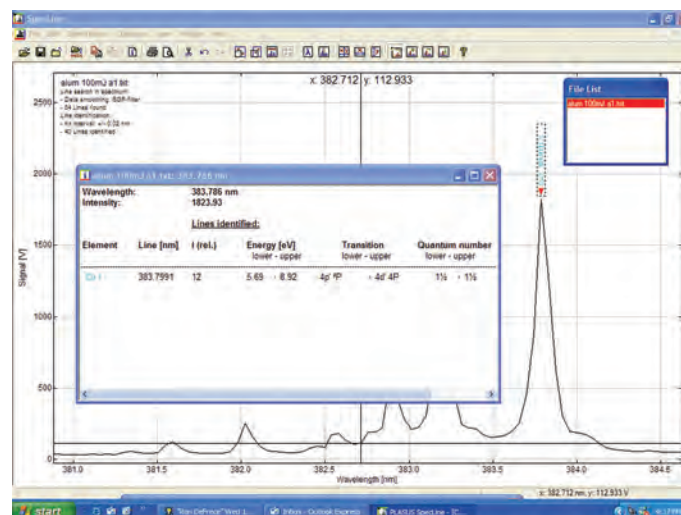
SpecLine Software comes with a USB or parallel-port (printer port) hardware key. The key is a security device to protect against unlicensed copies. It connects to an input/output port on your computer and must be used to run the software. SpecLine-U comes with a USB hardware key for use with Windows 98/2000/ME/XP operating systems (but not Windows 95 or NT). SpecLine-P comes with a feed-through parallel port hardware key.



In the Identify Lines window, you can search atoms from a Periodic Table, molecules from an extensive list, and elements in single or multiple ionization states.



In this window, a search on the peaks and lines in a spectrum has been completed and identified successfully.



This window demonstrates SpecLine's ability to provide detailed data on just one emission line.

# Software

## Available Items

Item code	Description	Category
JAZ-SPL	Scripting Language software development tool for Jaz systems	Device Drivers & Code
OMNI+SPAM	OmniDriver and SPAM together for one price	Device Drivers & Code
OMNIDRIVER	Java-based Spectroscopy Software Driver Package for select Windows, Macintosh and Linux operating systems	Device Drivers & Code
JAZ-A-IRRAD	Absolute irradiance application for Jaz	Jaz Application
Jaz-API	Application Programming Interface for Jaz	Jaz Device Drivers & Code
OOILIBSPLUS	LIBS2500plus Software	LIBS
RAM-ANIQ-LAB	Single license of chemometric software package designed for spectral analysis and chemometrics	Raman analysis
RAM-ANIQ-LAB-10USERS	Ten license bundle of chemometric software package designed for spectral analysis and chemometrics	Raman analysis
RAM-ANIQ-LAB-5USERS	Five license bundle of chemometric software package designed for spectral analysis and chemometrics	Raman analysis
RAM-ANIQ-RAMAN-LIB	Single license bundle of Raman Spectra Library with 1870 spectra	Raman analysis
RAM-ANIQ-RAMAN-LIB-10USERS	Ten license bundle of Raman Spectra Library with 1870 spectra	Raman analysis
RAM-ANIQ-RAMAN-LIB-5USERS	Five license bundle of Raman Spectra Library with 1870 spectra	Raman analysis
RAM-ANIQ-SPEC-MGR	Single license spectral database and data management package to manage spectral libraries	Raman analysis
RAM-ANIQ-SPEC-MGR-10USERS	Ten license bundle of spectral database and data management package to manage spectral libraries	Raman analysis
RAM-ANIQ-SPEC-MGR-5USERS	Five license bundle of spectral database and data management package to manage spectral libraries	Raman analysis
RAM-RSI-LIB	Raman database - complete collection, 8694 spectra - Requires RAM-RSIQ-QUAL Add-on	Raman analysis
RAM-RSIQ-CFR	Add-on module for RSIQ software supporting compliance with 21 CFR Part 11 "Electronic Records and Signatures"	Raman analysis
RAM-RSIQ-QUAL	Add-on module for RSIQ software that manages and searches user created or purchased Raman spectral libraries	Raman analysis
RAM-RSIQ-QUANT	Add-on module for RSIQ software, a multivariate analysis tool for calibration of Raman systems. Requires Thermo Scientific's GRAMS/AI software to edit and create a multivariate model to perform multivariate analysis	Raman analysis
SPECLINE-U	Software, with USB dongle for evaluation of spectral data	Spectral Identification
GRAMSAI	ThermoGalactic Spectral Processing Software	Spectral Processing
GRAMSAIF	ThermoGalactic Spectral Processing Software, International	Spectral Processing
GR-PLSPLUS_IQ	PLS Development Software for GRAMS/AI	Spectral Processing
GR-PLSPLUS_IQ-I	PLS Development Software for GRAMS/AI -- International	Spectral Processing
GR-SPECID	Spectral ID Software for use with GRAMS/AI	Spectral Processing
SPAM	Spectral Processing and Manipulation Software	Spectral Processing
LINEARITY	Linearity Correction	Spectrometer Operating
SPECTRASUITE	Cross-platform Spectroscopy Operating Software	Spectrometer Operating
SPECTRASUITE-20	SpectraSuite Site license; authorizes 1-20 copies	Spectrometer Operating
SpectraSuite+	Updated SpectraSuite Spectroscopy Operating Software	Spectrometer Operating
SPECTRASUITE-20-U	SpectraSuite-20 annual upgrade subscription fee	Spectrometer Operating
SPECTRASUITE-E	SpectraSuite Site license; authorizes 1-40 copies for Education	Spectrometer Operating
SPECTRASUITE-E-U	SpectraSuite-E annual upgrade subscription fee	Spectrometer Operating
SPECTRASUITE-PAR	Optional SpectraSuite module for PAR analysis	Spectrometer Operating
SPECTRASUITE-S	SpectraSuite site license; authorizes unlimited copies	Spectrometer Operating
SPECTRASUITE-S-U	SpectraSuite-S annual upgrade subscription fee	Spectrometer Operating
SPECTRASUITE-U	SpectraSuite annual upgrade subscription fee	Spectrometer Operating