

Алматы (7273)495-231	Иваново (4932)77-34-06	Магнитогорск (3519)55-03-13	Ростов-на-Дону (863)308-18-15	Тольятти (8482)63-91-07
Ангарск (3955)60-70-56	Ижевск (3412)26-03-58	Москва (495)268-04-70	Рязань (4912)46-61-64	Томск (3822)98-41-53
Архангельск (8182)63-90-72	Иркутск (395)279-98-46	Мурманск (8152)59-64-93	Самара (846)206-03-16	Тула (4872)33-79-87
Астрахань (8512)99-46-04	Казань (843)206-01-48	Набережные Челны (8552)20-53-41	Санкт-Петербург (812)309-46-40	Тюмень (3452)66-21-18
Барнаул (3852)73-04-60	Калининград (4012)72-03-81	Нижний Новгород (831)429-08-12	Саратов (845)249-38-78	Ульяновск (8422)24-23-59
Белгород (4722)40-23-64	Калуга (4842)92-23-67	Новокузнецк (3843)20-46-81	Севастополь (8692)22-31-93	Улан-Удэ (3012)59-97-51
Благовещенск (4162)22-76-07	Кемерово (3842)65-04-62	Ноябрьск (3496)41-32-12	Саранск (8342)22-96-24	Уфа (347)229-48-12
Брянск (4832)59-03-52	Киров (8332)68-02-04	Новосибирск (383)227-86-73	Симферополь (3652)67-13-56	Хабаровск (4212)92-98-04
Владивосток (423)249-28-31	Коломна (4966)23-41-49	Омск (3812)21-46-40	Смоленск (4812)29-41-54	Чебоксары (8352)28-53-07
Владикавказ (8672)28-90-48	Кострома (4942)77-07-48	Орел (4862)44-53-42	Сочи (862)225-72-31	Челябинск (351)202-03-61
Владимир (4922)49-43-18	Краснодар (861)203-40-90	Оренбург (3532)37-68-04	Ставрополь (8652)20-65-13	Череповец (8202)49-02-64
Волгоград (844)278-03-48	Красноярск (391)204-63-61	Пенза (8412)22-31-16	Сургут (3462)77-98-35	Чита (3022)38-34-83
Вологда (8172)26-41-59	Курск (4712)77-13-04	Петрозаводск (8142)55-98-37	Сыктывкар (8212)25-95-17	Якутск (4112)23-90-97
Воронеж (473)204-51-73	Курган (3522)50-90-47	Псков (8112)59-10-37	Тамбов (4752)50-40-97	Ярославль (4852)69-52-93
Екатеринбург (343)384-55-89	Липецк (4742)52-20-81	Пермь (342)205-81-47	Тверь (4822)63-31-35	

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Innovative Solutions for Your Application Needs

Spectrometer Catalog & Corporate Profile

What does B&W Tek do?

B&W Tek is an advanced analytical instrumentation company providing mobile solutions with a focus on handheld and portable Raman, LIBS, and NIR spectrometers. Originally established as a diode-pumped solid-state laser manufacturer in 1997, we've grown into an industry-leading, total solutions provider in photonics, coupling our core laser, spectrometer, and chemometric technologies with custom design and manufacturing capabilities.

Some industries that we serve:

- | | |
|------------------------------|-----------------------|
| Academic/Government Labs | Pharmaceutical |
| Art & Archaeology | Plastics & Polymers |
| Gems & Minerals | Petroleum & Petrochem |
| LED Lighting | Safety/Security |
| Medical & Biomedical OEM/OED | Semiconductor/Solar |
| Nanotech | Specialty Chemicals |



Our core technologies include:

- Diffraction Limited, Spectrum Stabilized, and High Power Lasers
- UV, Vis, NIR, & Raman Spectrometers
- Mobile Raman and LIBS Spectroscopy Systems
- Sampling Accessories & Broadband Light Sources

What can I expect from B&W Tek?

At B&W Tek, we guarantee superior performance, quality, and solid regulatory compliance standards on each product that leaves our facility. We operate in ISO 13485 & ISO 9001 certified facilities equipped with clean room environments and apply an extensive Quality Control Test to make sure our products and services pass or exceed domestic and international standards and regulations.

We have a full suite of Applications Support Services such as Installation Qualification (IQ), Operational Qualification (OQ), and Performance Qualification (PQ) checks, as well as software verification and validation. B&W Tek can also provide calibration and recertification services for our products.

- ISO 9001 & ISO 13485 Certified
- FDA & CDRH Registration and Compliance
- CE Safety Standards
- UL Safety Standards
- Manufacturing FDA Class II and III Devices



What makes B&W Tek different from other providers?

While there are many companies that can provide you with some of the components you need for your application, we are a “one-stop-shop” that provides everything you need in one place. In many of the industries we serve, we’re the only one of our kind. At B&W Tek, we pride ourselves on providing not just the pieces of each project, but a total solution. Due to our resources and expertise, we’re able to do this for our customers in a number of ways.

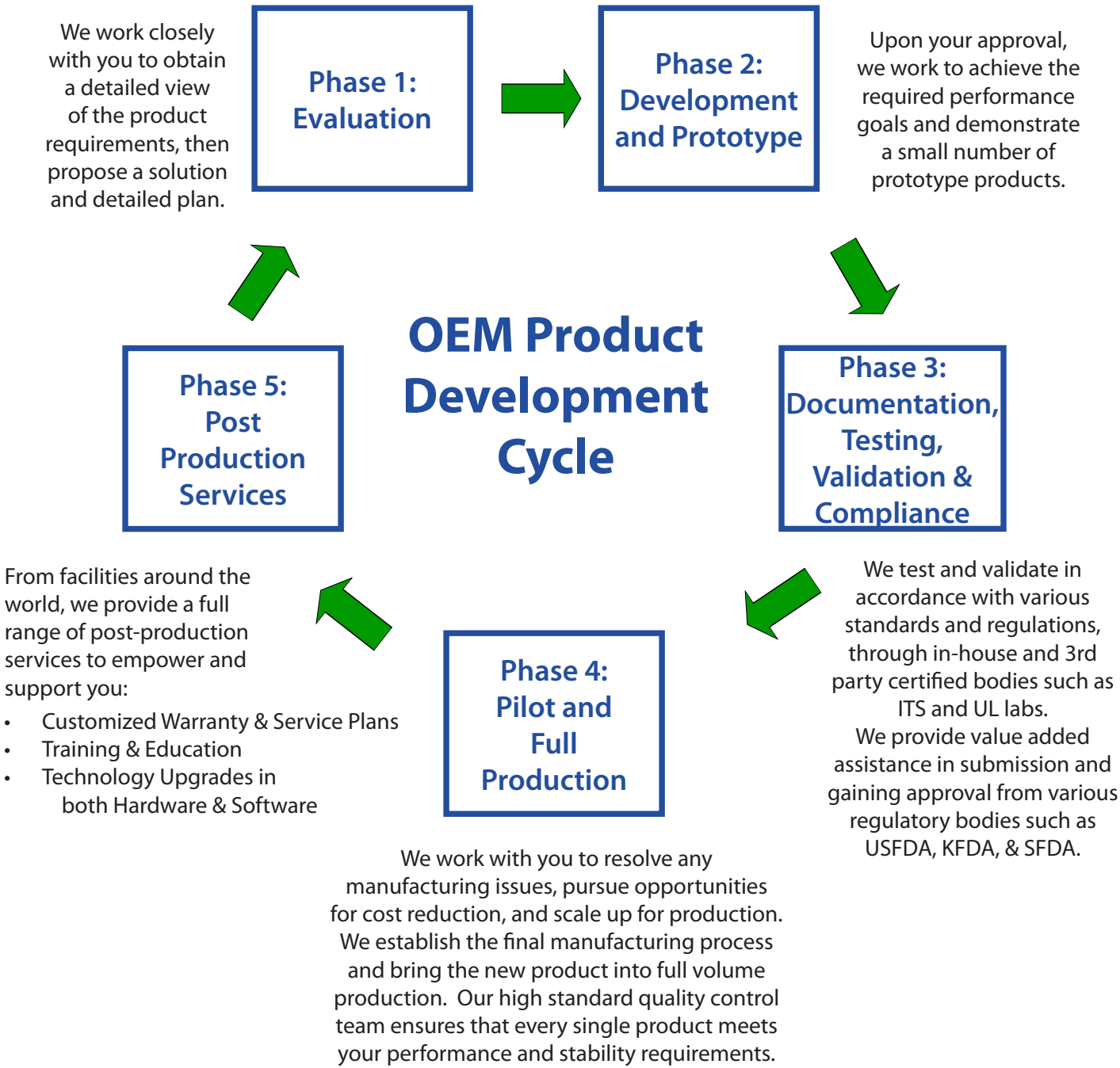
With a variety of extensive product families, we’re able to take an assortment of ready-to-use, off-the-shelf products and put them together to form a complete system. There are hundreds of possible options by combining any variety of our lasers, spectrometers, accessories, and even software packages - all of which are designed and built in house.



We’re also able to provide total solutions with input from you! By offering various services in industrial design, custom development, end-user training, and regulatory compliance testing and certification, we work with you to make your ideas come to life. We design, engineer, prototype and manufacture an extensive range of instrumentation for a variety of applications, working with you from concept to completion. Though we may not currently make the product that’s perfect for your application, we are always open to the challenge of creating new technologies and breaking into new applications.

How will B&W Tek make my ideas a reality?

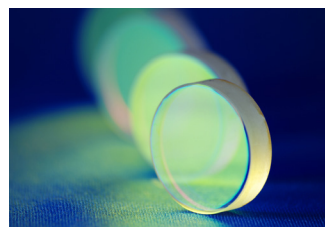
B&W Tek is a total solution provider of Laser, Spectrometer, IR, NIR and Raman Instrumentation because we not only work with our customers to understand their product needs, we help our customers achieve their business goals. At B&W Tek, we use our five step OEM Product Development Cycle to ensure we meet the overall goals of our customer at each milestone. Contact us at 302-368-7824 to speak to a specialist about your OEM needs.



Applications of Modular Spectroscopy

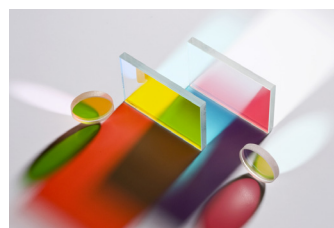
Reflectance:

- Reflectance is determined by first measuring a white reflectance standard and then measuring the surface of the material of interest in order to calculate the ratio between the two. Reflectance is one of the fundamental spectral properties of a material, and is one of the simplest measurements to make using a spectrometer.
- There are two primary components in a reflected spectrum: specular and diffuse. Each contains different information about the material. Depending on the component of interest, reflectance can be measured using a variety of accessories. Integrating spheres and fiber optic reflectance probes measure both diffuse and/or specular components, whereas a simple collimating lens can be used if you are only interested in the specular components.
- Reflectance can be used to characterize color (both specular & diffuse), coated & un-coated optical components, thin-film thickness, semiconductors, precious metals, and countless other materials.



Transmission:

- Transmission, which is also one of the most fundamental spectral properties of a material, has a very similar definition to reflectance. Transmission is defined as the ratio of the spectrum of incident light normal to the surface of the material and the spectrum of the light that is transmitted out of the other side of the material.
- Transmission measurements can be taken on solid, liquid and gas phase materials. Typically for solid materials, these measurements are made using two collimating lenses. For more challenging samples like liquids and gases, fiber coupled cuvette holders, flow cells, or immersion probes are used.
- Transmittance data is typically used for the characterization of optical components.



Absorption:

- Absorption is the log of transmission, but is the preferred method for most molecular spectroscopic analyses of materials. Absorption can be measured at any wavelength but is typically employed in the UV (200 - 400nm) and NIR (900 - 2200nm) ranges.
- Typical absorption set-ups are similar to transmission set-ups utilizing cuvette holders, flow cells, and immersion probes.
- Absorption allows for information to be gathered about the fundamental structure of a molecule and can be used for both qualitative and quantitative analyses.



Fluorescence:

- In fluorescence spectroscopy, a molecule is analyzed by exciting the species with a high energy photon (traditionally in the UV). This causes the electrons to transition from a ground state to a higher energy state. When the electron returns to the ground state, it emits a photon with lower energy which is equal to the energy level of which it was excited to. Therefore, by measuring the spectrum of the emitted light, you can investigate the different electronic and vibrational states of the molecule.
- Fluorescence spectroscopy can also be used to identify non-fluorescent compounds by tagging it with another molecule with known fluorescent properties and an affinity for the compound of interest.
- Typical fluorescence setups will employ a UV excitation source such as a pulsed xenon lamp or a UV laser directed onto a sample with a dichroic mirror to redirect the emitted light into a spectrometer. A right-angle (3-port) cuvette holder can also be used for liquid or powder samples.



Raman:

- Raman spectroscopy, a molecular spectroscopy which is observed as inelastically scattered light, allows for the interrogation and identification of vibrational (phonon) states of molecules. As a result, Raman spectroscopy provides an invaluable analytical tool for molecular finger printing as well as monitoring changes in molecular bond structure (e.g. state changes and stresses & strains).
- In comparison to other vibrational spectroscopy methods, such as FT-IR and NIR, Raman has several major advantages. These advantages stem from the fact that the Raman effect manifests itself in the light scattered off of a sample as opposed to the light absorbed by a sample. Similar to FT-IR, Raman spectroscopy is highly selective which allows Raman to identify and differentiate molecules and chemical species that are very similar.
- Because Raman spectroscopy is a weak process, the best quality data relies on the use of a TE Cooled spectrometer and a high quality laser.



Emission:

- Emission measurements are the simplest spectroscopic technique, and may be the most commonly used in history. When measuring emission, any variety of accessories can be utilized since in most cases you are not restricted by the size of the sample. Most of the time, a standard fiber optic patch cable is perfectly acceptable for the measurement.
- Examples of these types of measurements include elemental emission spectroscopy, spectral irradiance measurements, laser characterization, plasma endpoint detection, and countless others.



DIY Raman Solutions

Entry Level | Glacier X

Compact High Performance TE-Cooled CCD Spectrometer



Excitation	785 nm	532 nm
Coverage nm	750-1050 nm	530-690 nm
Coverage cm ⁻¹	0-3200 cm ⁻¹	0-4000 cm ⁻¹
Slit	10 μm	10 μm
Grating	1200/750	1800/500
Resolution (FWHM)	0.5 nm @ 912 nm	0.3 nm @ 614nm
Resolution (cm ⁻¹)	6 cm ⁻¹	8 cm ⁻¹
Detector Cooling	TE-Cooled 14° C	

Mid-Level | Exemplar Plus

High Performance Smart Spectrometer



Excitation	785 nm	532 nm
Coverage nm	750-1050 nm	532-680 nm
Coverage cm ⁻¹	0-3215 cm ⁻¹	0-4000 cm ⁻¹
Slit	25 μm	10 μm
Grating	830/900	1800/500
Resolution (FWHM)	0.60 nm @ 912 nm	0.30 nm @ 614 nm
Resolution (cm ⁻¹)	7 cm ⁻¹	8 cm ⁻¹
Detector Cooling	TE-Cooled 0° C	

Premium Level | Exemplar Pro

High Performance Smart Spectrometer



Excitation	785nm	532nm
Coverage nm	750-1050 nm	530-690 nm
Coverage cm ⁻¹	0-3125 cm ⁻¹	0-4000 cm ⁻¹
Slit	25 μm	10 μm
Grating	830/900	1800/500
Resolution (FWHM)	0.6 nm @ 912 nm	0.3 nm @ 614 nm
Resolution (cm ⁻¹)	7 cm ⁻¹	8 cm ⁻¹
Detector Cooling	TE-Cooled -20° C	

Lab Grade Raman Probe



Excitation	785 nm or 532 nm
Fiber Length	1.5 m
Shaft Length	76 mm
Shaft Diameter	9.5 mm
Window Material	Quartz
Working Distance	5.4 mm
Laser Surface Spot Size	85 μm
Fiber for Excitation	105μm Core with FC/PC Connector
Fiber for Collection	200μm Core with SMA 905 Male Connector

Laser Options

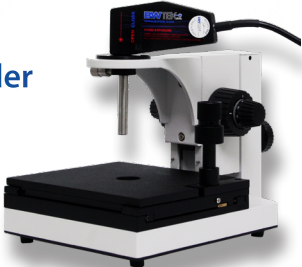
Excitation Source	532 nm	785 nm	1064 nm
Power	50 mW	300 mW	450 mW
Model	CleanLaze® 532	CleanLaze® 785	Call

Accessories

Liquid Vial Holder



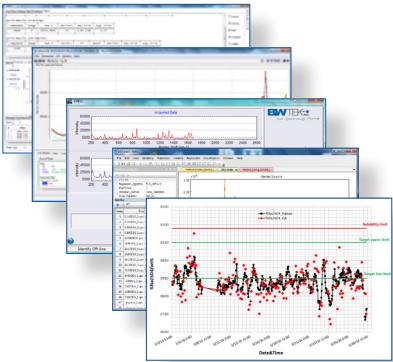
Probe Holder



Performance Validation Cap

Software

Excitation	785nm	532nm
BWSpec	Included	Included
SDK-SL-Windows	Available	Available
SDK-SL-Linux	Available	Available
SDK-SL-RS232	Available	Available
BWID SDK	Available	Available
Library Package	Available	Available



Modular Spectrometers



Quest™ X

Compact CCD Spectrometer

The Quest X is a linear CCD array spectrometer optomized for UV and NIR performance using a low stray light optical bench. It features a 2048 element detector, built in 16-bit digitizer, USB 2.0 interface with a >2.0 MHz readout speed, and external trigger. The Quest X is temperature compensated, which greatly reduces the thermal drift to ~15 counts/° C. This gives improved stablity by decreasing baseline drift and sustaining the dynamic range.

The Quest X is ideal for most UV, Vis, and NIIR applications with spectral configurations from 200nm to 1050nm and resolutions between 0.5nm and 4.0nm. Custom configurations and RS232 communication interface are available for OEM applications.

Wavelength Range	Pixels	Pixel Size	Digitization Rate	f/#	Spectra Per Second	Integration Time
200nm - 1050nm	2048	14 x 200µm	> 2.0 MHz	3.6	> 480	1ms, Adjustable in 1µs Increments

Slit	Dimensions	Approximate Resolutions					
Slit-Custom	Custom Slit Width						
Slit-200	200 µm wide x 1 mm high						
Slit-100	100 µm wide x 1 mm high						
Slit-50	50 µm wide x 1 mm high						
Slit-25	25 µm wide x 1 mm high						
Slit-10	10 µm wide x 1 mm high						
Filter to be used	Type, Groove density (g/mm)/Blaze λ (nm)	Range (nm)					
LVF (long)	Ruled, 600/250	200-850	1.0nm	1.8nm	3.0nm	4.0nm	Call
LVF (long)	Ruled, 600/400	350-1050	1.0nm	1.5nm	2.2nm	4.0nm	Call
LP-370	Ruled, 900/500	380-750	0.5nm	1.0nm	1.5nm	3.0nm	Call
LP-532	Ruled, 830/800	550-1050	0.7nm	1.2nm	2.0nm	3.5nm	Call
LP-570	Ruled, 1200/750	750-1000	0.6nm	0.8nm	1.2nm	3.5nm	Call
	Custom gratings and blazes available	Call					



Quest™ U

Low Straylight CCD Spectrometer

The Quest™ U is a linear CCD array spectrometer optimized for UV performance using a low straylight optical bench. It features a 2048 element detector, built-in 16-bit digitizer, USB 2.0 interface with a >2.0 MHz readout speed, and external trigger. The Quest™ U is temperature compensated, which greatly reduces the thermal drift to ~15 counts/°C. This decreases baseline drift and sustains the dynamic range.

Wavelength Range	Pixels	Pixel Size	Digitization Rate	f/#	Spectra Per Second	Integration Time
200nm - 850nm	2048	14 x 200µm	> 2.0 MHz	3.6	> 480	1ms, Adjustable in 1µs Increments

Slit	Dimensions	Approximate Resolutions					
Slit-Custom	Custom Slit Width						
Slit-200	200 µm wide x 1 mm high						
Slit-100	100 µm wide x 1 mm high						
Slit-50	50 µm wide x 1 mm high						
Slit-25	25 µm wide x 1 mm high						
Slit-10	10 µm wide x 1 mm high						
Filter to be used	Type, Groove density (g/mm)/Blaze λ (nm)	Range (nm)					
NA	Ruled, 1800/250	200-400	0.4nm	0.6nm	1.0nm	1.6nm	3.0nm
LVF (long)	Ruled, 600/250	200-850	1.0nm	1.5nm	2.5nm	4.0nm	8.0nm
	Custom gratings and blazes available	Call					

Modular Spectrometers



Exemplar®

Smart CCD Spectrometer

The Exemplar® is the next step in the evolution of miniature CCD spectrometers. It is the first smart spectrometer featuring on board data processing, USB 3.0 communication, and temperature compensation. The Exemplar is also optimized for multi-channel operation featuring ultra-low trigger delay and gate jitter. The Exemplar is ideal for most visible and near-infrared applications.

- Front Illuminated, Non-Cooled CCD
- Czerny-Turner Spectrograph
- More than 900 Spectra Per Second with Burst Mode

Wavelength Range	Pixels	Pixel Size	Digitization Rate	f/#	Spectra Per Second	Integration Time
200nm - 1050nm	2048	14 x 200µm	> 2.0 MHz	3.6	> 900	1ms, Adjustable in 1µs Increments

Slit	Dimensions	Approximate Resolutions					
Slit-Custom	Custom Slit Width						
Slit-100	100 µm wide x 1 mm high						
Slit-50	50 µm wide x 1 mm high						
Slit-25	25 µm wide x 1 mm high						
Slit-10	10 µm wide x 1 mm high						
Filter to be used	Type, Groove density (g/mm)/Blaze λ (nm)	Range (nm)					
LVF (long)	Ruled, 600/400	350-1050	1.0nm	1.5nm	2.2nm	4.0nm	Call
LP-370	Ruled, 900/500	380-750	0.5nm	1.0nm	1.5nm	3.0nm	Call
LP-570	Ruled, 1200/750	750-1000	0.6nm	0.8nm	1.2nm	2.5nm	Call
	Custom gratings and blazes available	Call					



Exemplar® LS

Low Straylight Smart CCD Spectrometer

The Exemplar® LS is a smart CCD spectrometer optimized for low straylight by utilizing an unfolded Czerny-Turner spectrograph. It features on board data processing, USB 3.0 communication, and temperature compensation. The Exemplar LS is also optimized for multi-channel operation, featuring ultra-low trigger delay and gate jitter.

Wavelength Range	Pixels	Pixel Size	Digitization Rate	f/#	Spectra Per Second	Integration Time
200nm - 850nm	2048	14 x 200µm	> 2.0 MHz	3.6	> 900	1ms, Adjustable in 1µs Increments

Slit	Dimensions	Approximate Resolutions					
Slit-Custom	Custom Slit Width						
Slit-200	200 µm wide x 1 mm high						
Slit-100	100 µm wide x 1 mm high						
Slit-50	50 µm wide x 1 mm high						
Slit-25	25 µm wide x 1 mm high						
Slit-10	10 µm wide x 1 mm high						
Filter to be used	Type, Groove density (g/mm)/Blaze λ (nm)	Range (nm)					
LVF (long)	Ruled, 1800/250	200-400	0.4nm	0.6nm	1.0nm	1.6nm	3.0nm
LP-370	Ruled, 600/250	200-850	1.0nm	1.5nm	2.5nm	4.0nm	8.0nm
	Custom gratings and blazes available	Call					

Modular Spectrometers



Exemplar® Plus

High Performance Smart Spectrometer

The Exemplar® Plus is a high performance smart spectrometer utilizing a low stray light unfolded Czerny-Turner spectrograph. It features a highly sensitive TE-Cooled back-thinned (BT) CCD detector which is linearly summed for high dynamic range. The Exemplar Plus features a high signal to noise ratio, making it ideal for low light level applications, and also features a built-in shutter allowing for dark scan measurements, even while illuminated.

Wavelength Range	Pixels	Pixel Size	Digitization Rate	f/#	Spectra Per Second	Integration Time
190nm - 1100nm	2048	14µm x ~ 0.9mm	>400kHz	3.6	> 140	6.3ms, Adjustable in 1µs Increments

Slit	Dimensions	Approximate Resolutions					
Slit-Custom	Custom Slit Width						
Slit-100	100 µm wide x 1 mm high						
Slit-50	50 µm wide x 1 mm high						
Slit-25	25 µm wide x 1 mm high						
Slit-10	10 µm wide x 1 mm high						
Filter to be used	Type, Groove density (g/mm)/Blaze λ (nm)	Range (nm)					
LVF (long)	Ruled, 400/550	350-1050	1.2nm	1.5nm	2.4nm	4.8nm	Call
LP-570	Ruled, 830/900	750-1050	0.4nm	0.6nm	0.98nm	1.55nm	Call
LVF (long)	Ruled, 300/280	190-1100	1.3nm	1.8nm	2.6nm	5.2nm	Call
LVF (long)	Ruled, 400/250	200-850	0.9nm	1.3nm	2.0nm	4.2nm	Call
Not Applicable	Ruled, 1500/250	190-380	0.28nm	0.42nm	0.54nm	1.05nm	Call
	Custom gratings and blazes available	Call					



Exemplar® Plus LS

High Performance Smart Spectrometer

The Exemplar® Plus LS is a high performance smart spectrometer utilizing an aberration corrected concave holographic grating, to minimize stray light. Its long focal length, coupled with a high quantum efficiency detector, provides superior data quality over the entire 190-1100nm spectral range.

Wavelength Range	Pixels	Pixel Size	Digitization Rate	f/#	Spectra Per Second	Integration Time
180nm - 1100nm	2048	14µm x ~ 0.9mm	>400 kHz	3.0	> 140	6.3ms, Adjustable in 1µs Increments

Slit	Dimensions	Approximate Resolutions					
Slit-Custom	Custom Slit Width						
Slit-100	100 µm wide x 1 mm high						
Slit-50	50 µm wide x 1 mm high						
Slit-25	25 µm wide x 1 mm high						
Slit-10	10 µm wide x 1 mm high						
Filter to be used	Type, Groove density (g/mm)/Blaze λ (nm)	Range (nm)					
Not Applicable	Concave Holographic	180-450	0.6nm	0.7nm	1.2nm	2.3nm	Call
LVF (long)	Concave Holographic	190-800	1.5nm	1.7nm	2.5nm	4.5nm	Call
LVF (long)	Concave Holographic	190-1100	2.0nm	2.5nm	3.2nm	6.0nm	Call
LVF (long)	Concave Holographic	200-550	0.6nm	0.7nm	1.2nm	2.5nm	Call
LVF (long)	Concave Holographic	350-1050	1.2nm	2.0nm	2.9nm	5.5nm	Call
LP-395	Concave Holographic	400-800	1.0nm	1.3nm	2.3nm	4.5nm	Call
	Custom gratings and blazes available	Call					

Modular Spectrometers



Exemplar® Pro

High Performance Smart Spectrometer

The Exemplar® Pro is a high performance smart spectrometer utilizing a low stray light unfolded Czerny-Turner spectrograph. It features a highly sensitive deep TE-Cooled back-thinned (BT) CCD detector which is linearly summed for high dynamic range, even while illuminated.

Wavelength Range	Pixels	Pixel Size	Digitization Rate	f/#	Spectra Per Second	Integration Time
190nm - 1100nm	2048	14µm x ~ 0.9mm	>400kHz	3.6	> 140	6.3ms, Adjustable in 1µs Increments

Slit	Dimensions	Approximate Resolutions					
Slit-Custom	Custom Slit Width						
Slit-100	100 µm wide x 1 mm high						
Slit-50	50 µm wide x 1 mm high						
Slit-25	25 µm wide x 1 mm high						
Slit-10	10 µm wide x 1 mm high						
Filter to be used	Type, Groove density (g/mm)/Blaze λ (nm)	Range (nm)					
LP-570	Ruled, 830/900	750-1000	0.4nm	0.6nm	0.98nm	1.55nm	Call
LP-495	Ruled, 1800/500	532-680	0.3nm	0.6nm	0.96nm	1.53nm	Call
	Custom gratings and blazes available	Call					



Glacier® X

Compact High Performance TE-Cooled CCD Spectrometer

The Glacier® X is a TE-Cooled linear CCD array spectrometer. It features a 2048 element detector, built-in 16-bit digitizer, and USB 2.0 interface. Compared to non-cooled CCD spectrometers, the Glacier® X offers higher dynamic range, significantly reduced dark counts, and superior long-term operation stability, making it ideal for low light level detection and long-term monitoring applications.

Wavelength Range	Pixels	Pixel Size	Digitization Rate	f/#	Spectra Per Second	Integration Time
200nm - 1050nm	2048	14 x 200µm	500kHz	3.2	> 180	1ms, Adjustable in 1µs Increments

Slit	Dimensions	Approximate Resolutions					
Slit-Custom	Custom Slit Width						
Slit-100	100 µm wide x 1 mm high						
Slit-50	50 µm wide x 1 mm high						
Slit-25	25 µm wide x 1 mm high						
Slit-10	10 µm wide x 1 mm high						
Filter to be used	Type, Groove density (g/mm)/Blaze λ (nm)	Range (nm)					
Not Applicable	Ruled, 1800/250	200-400	0.3nm	0.5nm	0.8nm	1.6nm	Call
LVF (long)	Ruled, 716/222	200-800	0.9nm	1.2nm	2.0nm	4.0nm	Call
LVF (long)	Ruled, 1200/250	250-600	0.6nm	0.9nm	1.5nm	3.0nm	Call
Not Applicable	Ruled, 3600/240	280-370	0.2nm	0.3nm	0.5nm	1.0nm	Call
LVF (long)	Ruled, 600/400	300-900	0.8nm	1.2nm	2.0nm	4.5nm	Call
LVF (long)	Ruled, 700/530	350-1050	1.1nm	1.4nm	2.2nm	4.3nm	Call
LP-370	Ruled, 900/500	380-750	0.6nm	1.0nm	1.8nm	3.0nm	Call
LP-395	Ruled, 1200/500	400-800	0.4nm	0.6nm	1.2nm	2.5nm	Call
LVF (long)	Ruled, 830/800	450-1050	0.9nm	1.2nm	2.0nm	4.0nm	Call
LP-495	Ruled, 1800/500	530-700	0.4nm	0.6nm	0.9nm	1.6nm	Call
LP-570	Ruled, 1714/650	600-800	0.3nm	0.5nm	0.8nm	1.7nm	Call
LP-570	Ruled, 1200/750	750-1050	0.5nm	0.8nm	1.4nm	2.5nm	Call
	Custom gratings and blazes available	Call					

Modular Spectrometers



Sol™ 1.7

NIR TE-Cooled InGaAs Array Spectrometer

The Sol™ 1.7 is a high performance linear InGaAs array spectrometer, featuring 256 and 512 (standard) pixels with TE Cooling down to -5°C, all while providing high throughput and large dynamic range.

With our spectral acquisition software, you can select between High Sensitivity and High Dynamic Range mode within your pre-configured spectral range. Customized spectral resolution and application support are available.

Wavelength Range	Pixels	Pixel Size	Digitization Rate	f/#	Spectra Per Second	Integration Time
900nm - 1700nm	512	25 x 500µm	500kHz	3.5	> 200	200µs to >= 64 Seconds

Slit	Dimensions			Approximate Resolutions		
Slit-Custom	Custom Slit Width					Custom
Slit-100	100 µm wide x 1 mm high			50 µm	100 µm	
Slit-50	50 µm wide x 1 mm high					
Slit-25	25 µm wide x 1 mm high					
Filter to be used	Type, Groove density (g/mm)/Blaze λ (nm)	Range (nm)	25 µm			
LP-1000	Ruled, 1000/1310 (S Configuration only)	1500-1600	0.35nm	0.7nm	1.5nm	Call
LP-1000	Ruled, 1000/1310 (S Configuration only)	1260-1355	0.4nm	0.8nm	1.6nm	Call
LP-1000	Ruled, 600/1200 (S Configuration only)	1450-1650	0.8nm	1.5nm	3.0nm	Call
LP-1000	Ruled, 600/1200 (S Configuration only)	1200-1400	0.7nm	1.5nm	3.0nm	Call
LP-870	Ruled, 300/1200 (S Configuration only)	900-1300	1.5nm	3.0nm	6.0nm	Call
LP-1000	Ruled, 300/1200 (S Configuration only)	1200-1600	1.5nm	3.0nm	6.0nm	Call
LP-870	Ruled, 150/1250 (L or S Configuration available)	900-1700	4.0nm	5.0nm	8.4nm	Call
	Custom gratings and blazes available	Call				



Sol™ 2.2A

NIR TE-Cooled InGaAs Array Spectrometer

The Sol™ 2.2A is a high performance linear InGaAs array spectrometer featuring 256 pixels and providing high throughput and large dynamic range with TE Cooling down to -15°C via a built-in 3-stage cooler.

Each spectrometer features an SMA 905 fiber optic input, built-in 16-bit digitizer, and is USB 2.0 plug-and-play compatible. The built-in autozero function automatically reduces dark current and dark non-uniformity, resulting in an increased signal-to-noise ratio.

Wavelength Range	Pixels	Pixel Size	Digitization Rate	f/#	Spectra Per Second	Integration Time
900nm - 2200nm	256	50 x 250µm	500kHz	3.5	> 300	250µs to >= 64 Seconds

Slit	Dimensions	Approximate Resolutions				
Slit-Custom	Custom Slit Width					Custom
Slit-100	100 µm wide x 1 mm high				100 µm	
Slit-50	50 µm wide x 1 mm high				50 µm	
Filter to be used	Type, Groove density (g/mm)/Blaze λ (nm)	Range (nm)				
Call	Ruled, 85/1350	900-2200		15.0nm	25.0nm	Call
LP-1000	Ruled, 100/1600	1100-2200		9.0nm	18.0nm	Call
	Custom gratings and blazes available		Call			

Modular Spectrometers



Sol™ 2.6

NIR TE-Cooled InGaAs Array Spectrometer

The Sol™ 2.6 is a high performance linear InGaAs array spectrometer featuring 256 pixels and providing high throughput and large dynamic range with TE-Cooling down to -15°C via a built-in 3-stage cooler.

Wavelength Range	Pixels	Pixel Size	Digitization Rate	f/#	Spectra Per Second	Integration Time
1550nm - 2550nm	256	50 x 250µm	500kHz	3.5	> 300	250µs to >= 64 Seconds

Slit	Dimensions			
Slit-Custom	Custom Slit Width			Custom
Slit-75	75 μm wide x 1 mm high		75 μm	
Filter to be used	Type, Groove density (g/mm)/Blaze λ (nm)	Range (nm)		
LP-1500	Ruled, 100/2500	1550-2550	15.0nm	Call
	Custom gratings and blazes available	Call		

Accessories

BDS100 Deuterium/Tungsten Light Source

The BDS100 is a DC powered turnkey SMA 905 fiber coupled UV/Vis/NIR light source with spectral output from 200 to > 1100nm. The 3W UV lamp is an electrode-less, RF induced deuterium lamp which shares a single optical path with the 3W tungsten halogen lamp. Features include a safety shutter and individual On/Off controls for both the deuterium and tungsten sources.



BDS130A Deuterium/Tungsten Light Source

The BDS130A is an AC powered turnkey SMA 905 fiber coupled UV/Vis/NIR light source with a spectral output of 190 to > 2500nm. The 30W deuterium lamp and 5W tungsten halogen lamp share a single optical path. Features include a safety shutter and individual On/Off controls for both the deuterium and tungsten lamps.



BPS101 Tungsten Halogen Light Source

The BPS101 is a DC powered high performance SMA 905 fiber coupled constant current tungsten halogen light source with a spectral output of 350 to > 2600nm. A user replaceable 5W input power bulb has a ~10,000 hour lifetime with a color temperature of 2800K. Constant current provides precision current control for stable performance. A remote control port provides On/Off modulation, operating current monitoring, and external operating current control.



SCL100 Spectral Calibration

The SCL100 is a series of DC powered compact SMA 905 fiber coupled spectral calibration light sources. The SCL100 can be used for wavelength calibration of monochromators, spectrometers, and spectroradiometers. By exciting these various gases, they will produce narrow intense lines of the corresponding element(s). There are 6 lamp models to select from: Argon (Ar), Krypton (Kr), Mercury (Hg), Mercury/Argon (Hg/Ar), Neon (Ne), and Xenon (Xe).



Accessories

BPS2.0 Tungsten Halogen Light Source

The BPS2.0 is a DC powered, high performance, SMA 905 fiber coupled, constant current tungsten halogen light source with a spectral output of 350 to > 2600nm. A user replaceable 20W bulb has a ~2,000 hour lifetime with a color temperature of 2900K. Constant current provides precision current control for stable performance. The BPS2.0 incorporates a fan for thermal stability for low drift. A remote control port provides On/Off modulation, operating current monitoring, and external operating current control.



BPX100 Pulsed Xenon Light Source

The BPX100 is an AC powered compact SMA 905 fiber coupled 5W Xenon flash lamp module with a spectral output of 185 - 2000nm. By passing an electrical current through a Xenon gas, the BPX100 produces both continuous and line spectra. Low pulse-to-pulse variations and long operating life characteristics makes the BPX100 ideal as an excitation light source for fluorescence spectroscopy and UV rich sources for reflectance and transmittance spectrophotometry.



BCH100A & BCH103A Cuvette Holders

The BCH100A & BCH103A cuvette sample holders are designed for fiber optic illumination/detection. A standard 12.5 x 12.5mm (OD) (1 cm path length) cuvette can be used for liquid sample transmittance and absorbance. Two SMA 905 fiber couplers with collimated optics come with the BCH100A and three come with the BCH103. Both can be used with any B&W Tek. fiber, array spectrometer and BPS or BDS light sources. The BCH100A comes with two "straight through" SMA 905 ports. The BCH103A can be used for fluorescence when set up for right angle measurements with respect to illumination.



BFH105 Inline Filter Holder

The BFH105 inline filter holder is designed to hold up to three standard Ø 1 in x 5 mm filters (sold separately). The BFH105 has two SMA 905 fiber connections with collimated optics and can be used with any B&W Tek array spectrometer and light source.



Accessories

BIP2.0 Integrating Sphere with Integrated Light Source

The BIP2.0 is a compact, fiber coupled integrating sphere with an integrated 20W tungsten halogen lamp which emits over the UV-NIR Spectrum. The two inch diameter integrating sphere is machined from PTFE. PTFE is reflective and highly Lambertian over the broad spectral range of 250-2500nm and 99% from 400-800nm. The BIP2.0 incorporates a fan for thermal stability for low drift and operates on 12 V DC. It is designed for measuring diffused reflectance using any B&W Tek array spectrometer.



BIS1.5 Integrating Sphere

The BIS1.5 is a compact, integrating sphere designed as a sampling accessory for measuring diffused transmittance using any B&W Tek array spectrometer. The 1.5 inch diameter integrating sphere is machined from PTFE. PTFE is reflective and highly Lambertian over the broad spectral range of 250-2500nm and 99% from 400-800nm.



Fiber Patch Cords

The Fiber Patch Cords (FPC) are fiber optic cables terminated with SMA905 connectors on both ends (FC connectors available upon request). These are available in UV, NIR, and MIR grade fused silica optical fibers with various core diameters. Fiber core sizes range from 50µm to 1000µm with a standard length of 1.5 meters with custom lengths available upon request.



BFA & BRS Bifurcated Fibers

The Bifurcated Fiber Assembly (BFA) series combines optical fibers at a common end with the fiber bundle bifurcated into two separate channels. These channels can connect to a light source and a spectrometer or split an incoming signal into two separate spectrometer channels. When a collimating lens is attached to the common end of the assembly and positioned correctly, the specular reflectance for 0° angle of incidence can also be measured.



Accessories

Accessories

Fiber Dip Probe

The fiber dip probe (FDP) series can be used for measuring the transmittance and absorbance of liquid solutions. The fiber dip probe can be inserted into liquids for *in situ* transfectance measurements. Typical applications include observing changes in solutions for kinetic reaction studies or dissolution testing.



Fiber Reflectance Probe

The Fiber Reflectance Probe (FRP) series combines 7 optical fibers at the sample end into a bifurcated fiber. This bifurcated fiber splits into one fiber and 6 stacked fibers with the single fiber connecting to a light source and the 6 stacked fibers connecting to a spectrometer. These stacked fibers align to the spectrometer's slit for increased signal input. When properly setup, the FRP can measure diffuse or specular reflectance from surfaces.



Fiber Reflectance Probe Holder

The FRPH fiber reflectance probe holder is designed to hold a reflectance probe at either a 0° or 45° angle for easy alignment when performing reflectance based spectroscopy.

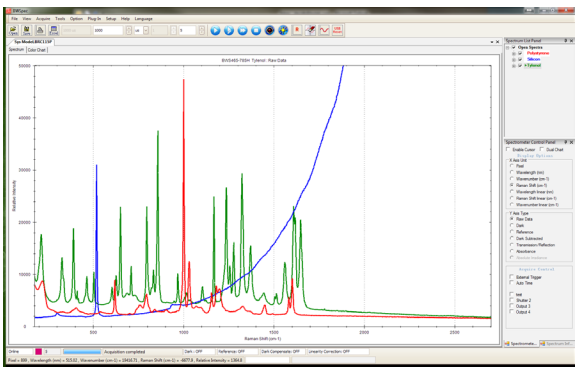


Spectral Reflectance Reference

The SRR spectral reflectance reference is used to measure a reference spectrum in order to calibrate your setup for reflectance measurements. This reference is possible because it is a "pure" white material, reflecting nearly 100% of light across a broad spectral range.



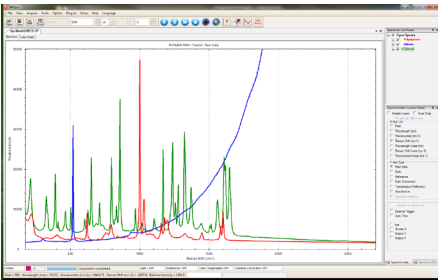
BWSpec®



BWSpec® is a spectral data acquisition software developed by B&W Tek and is the foundation for all B&W Tek. software platforms. It is included with the purchase of all B&W Tek products that use it to operate, which include spectrometers, systems, and accessories. BWSpec® is ideal for broad range applications since it delivers a wide range of features designed to perform complex measurements and calculations at the click of a button. It features multiple data formats and the capability to optimize scanning parameters, such as integration time and laser output power control. In addition to data acquisition and data processing, other features include automatic dark removal, spectrum smoothing, and manual/auto baseline correction.

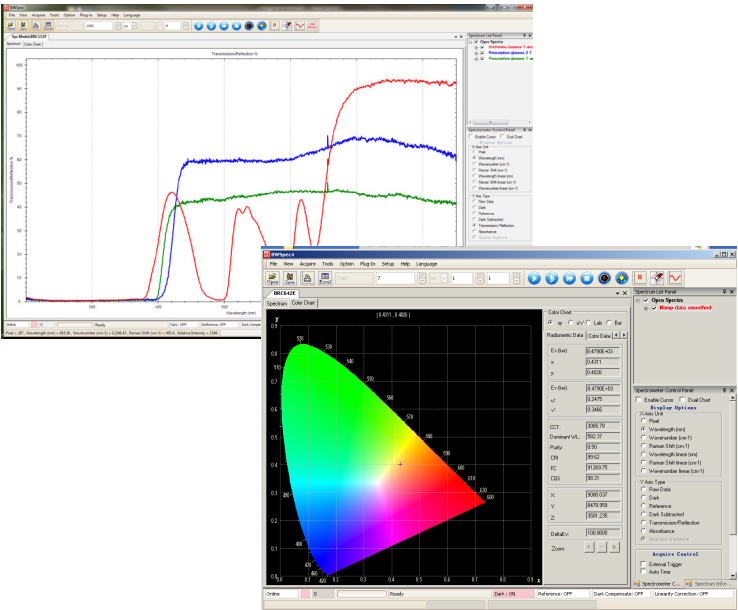
Features:

- Included with B&W Tek Spectrometers, Systems, and Accessories (if applicable)
- Performs Emission, Absorbance, Percent Transmission / Reflection, and Raman Measurements
- Capable of Continuous and Single Scan Acquisition
- Subtracts Dark Noise
- Offers Spectral File Formats: txt & spc
- Exports Spectral Files to Excel®
- Features Manual and Automatic Baseline Correction
- Includes Peak Smoothing Algorithms: FFT, Savitzky-Golay, & Boxcar
- Includes Derivative Algorithms: Point Diff, Savitzky-Golay, & Differentiate
- Performs Area Calculations
- Offers Peak Analysis Options: Center Wavelength, Integrated Power Density, FWHM Calculations, and More
- Contains Basic Spectral Math: Addition, Subtraction, Multiplication, and Division
- Also Features: Tristimulus, Chromaticity, and Color Calculations



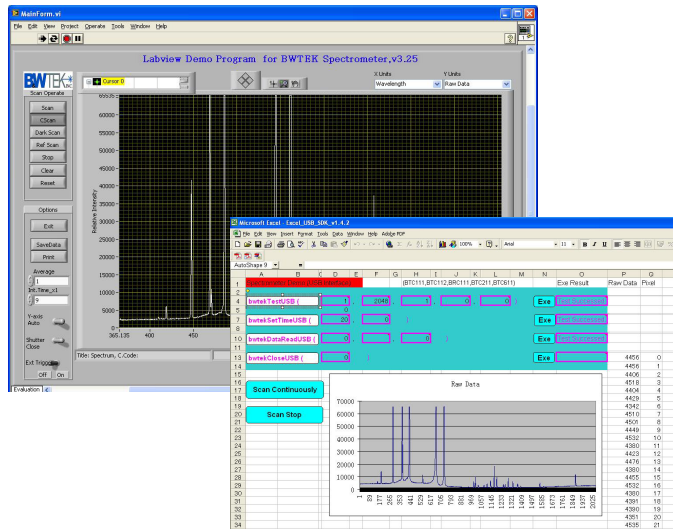
Applications:

- **Transmission**
- **Absorption**
- **Reflectance**
- **Fluorescence**
- **Raman**
- **Color / Irradiance**



Accessories

Software Development Kit



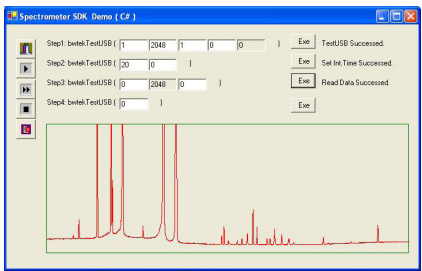
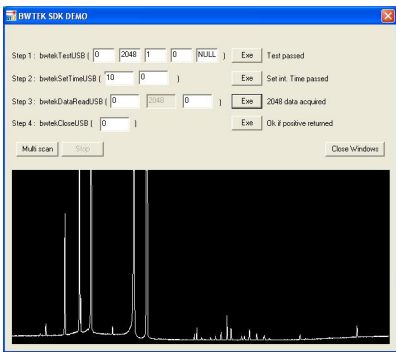
Features:

The SDK Package comes complete with simple programming examples done with our various spectrometer models to get you started.

- C#
- VBA
- C++ Builder 6
- Labview
- Visual C++ 6.0
- VB.NET
- Visual Basic 6.0

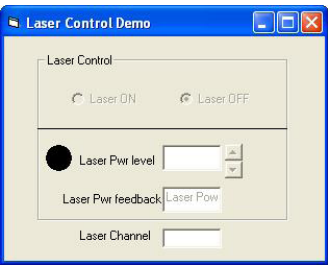
SDK Supports:

- Raman Systems
- Reflectance Systems
- Transmittance Systems
- USB Cleanlaze® Lasers
- RS232 Spectrometers
- USB Spectrometers



B&W Tek's SDK (Software Development Kit) provides you with the detailed function calls to our .DLL files. This package is designed for customers who wish to create their own custom software interface allowing complete control over your spectrometer or system.

Every spectrometer / system we sell can be run using the SDK, including RS232 and USB units, from non-cooled spectrometers to complete Raman systems with laser power control.



Program Examples:

Specification	Interface
C# SDK	USB Spectrometers
VB.Net SDK	USB Spectrometers
C++ Builder 6 SDK	USB Spectrometers
Visual C++ 6.0 SDK	USB Spectrometers
Visual Basic 6.0 SDK	USB Spectrometers / Lasers
VBA SDK	USB Spectrometers
Labview 8.2 SDK	USB Spectrometers
RS232 Interface SDK	RS232 Spectrometers

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