Sciencetech Catalogue

Mission Statement: "To serve the New Product Development market in the field of Optics and Spectroscopy with dedication, integrity and excellence."

For your convenience we have divided our catalogue into following main sections:

We have attempted to place all of our products into their most logical category. Any accessories that are directly linked to one of the seven sections can be found in their respective section. For example the lamp beam conditioners can be found in the Light Sources section. More general accessories such as motor control units and optical tables are located in the Accessories section. However, should you have difficulty locating a specific product, a table of contents is presented on the next pages and a complete alphabetical and numerical index can be found at the end of the catalogue.

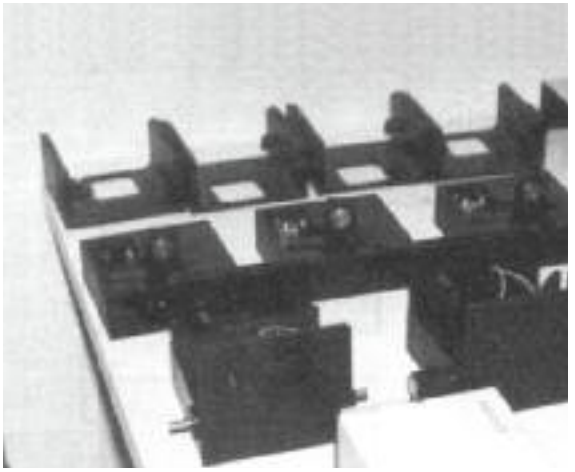
The Modular Instruments section presents Sciencetech's instrumentation systems which are comprised of interchangeable modular units. These units are taken from Sciencetech's line of monochromators, light sources, detection systems and accessories. Modular systems offer many advantages to the researcher with compared to specialized systems, including versatility, the ability to upgrade economically, easy to recycle components and the convenience of a system that suits your individual needs. A brief description of each component is given in each system description but for more complete information about components; please locate the individual components in their respective sections.

Thank you for your interest in Sciencetech Inc. If you have any questions, comments or suggestions please feel free to call us at either of our offices. Information regarding the Sciencetech limited warranty and terms of sale may be found on the back page of this catalogue.

NOTE: Product sizes and dimensions may appear distorted in photographs due to the printing procedure. For more accurate and descriptive photographs please contact Sciencetech Inc. Prices are subject to change without notice.

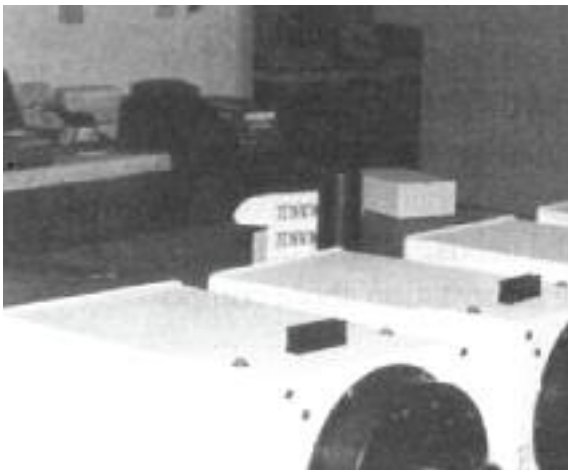
Sciencetech Inc. has launched its NEW website.
Our website is now an on-line product database featuring
300+ products and components, as well as up-to-date pricing.
Please visit our website at: www.sciencetech-inc.com

All products described in this catalogue with the label "Sciencetech" attached are designed and manufactured in house at our plant in London. Sciencetech also performs OEM manufacturing at our plant.

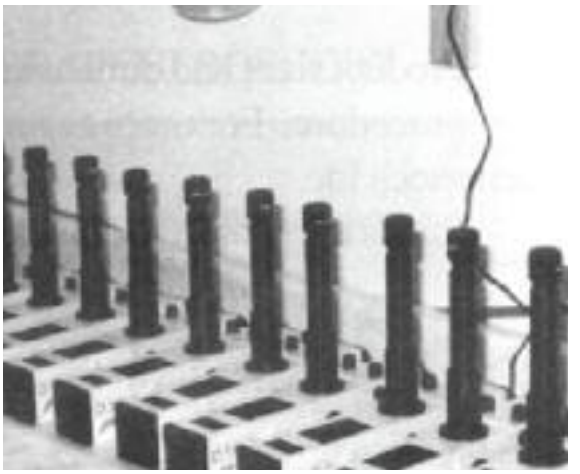


Manufacturing of Model 9030 Monochromators

Assembly of the SPS-200 FTIR Spectrometer



OEM Manufacturing of Fibre illuminators and Filter Wheels



OEM Manufacturing of Microscope Photometers

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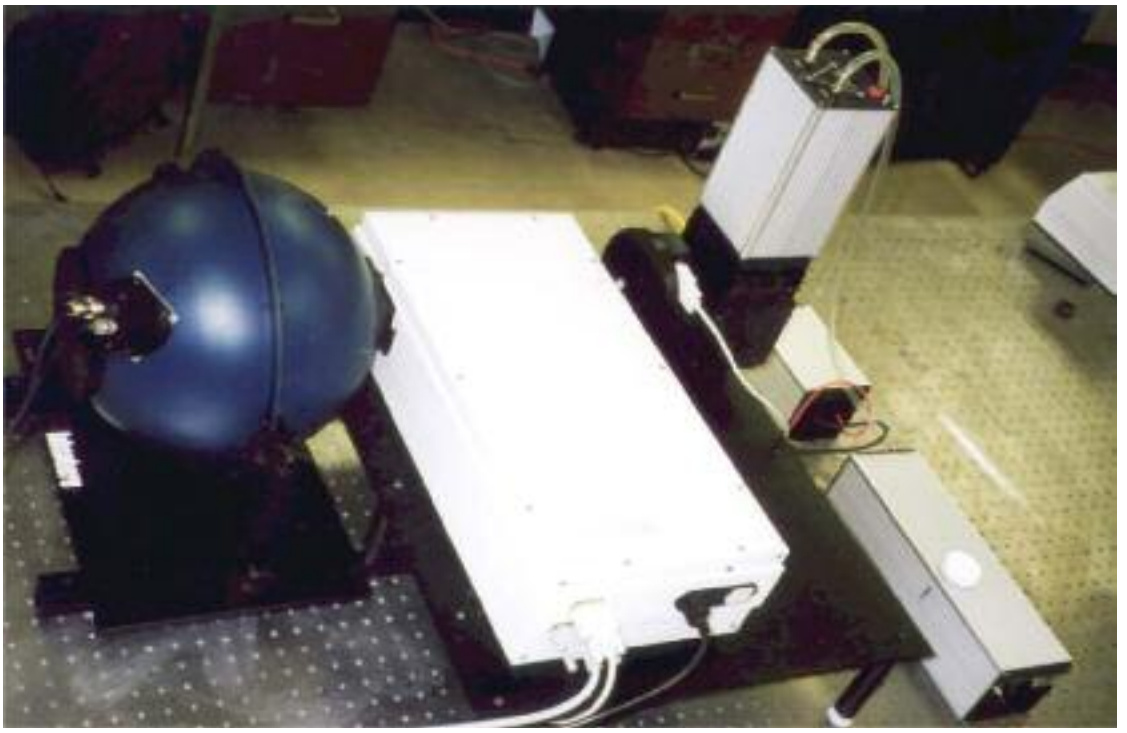
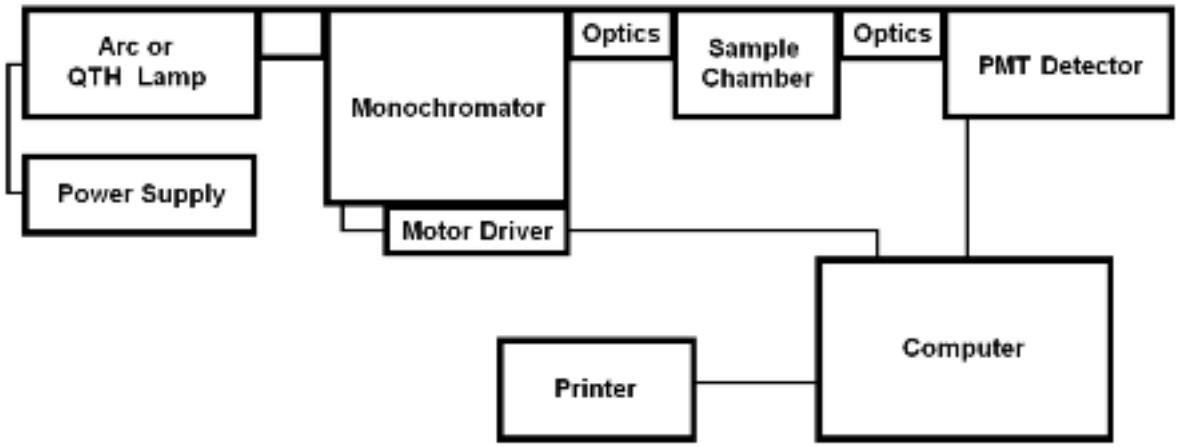
Modular Systems

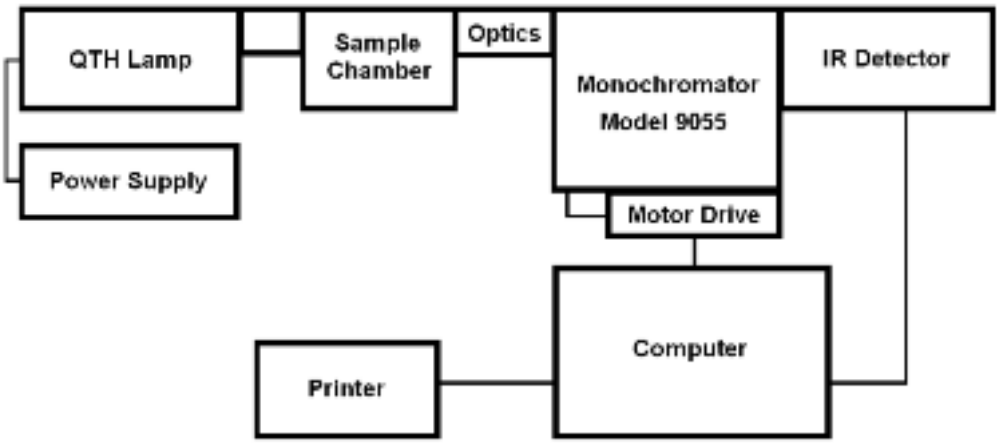


Spectroscopic Systems

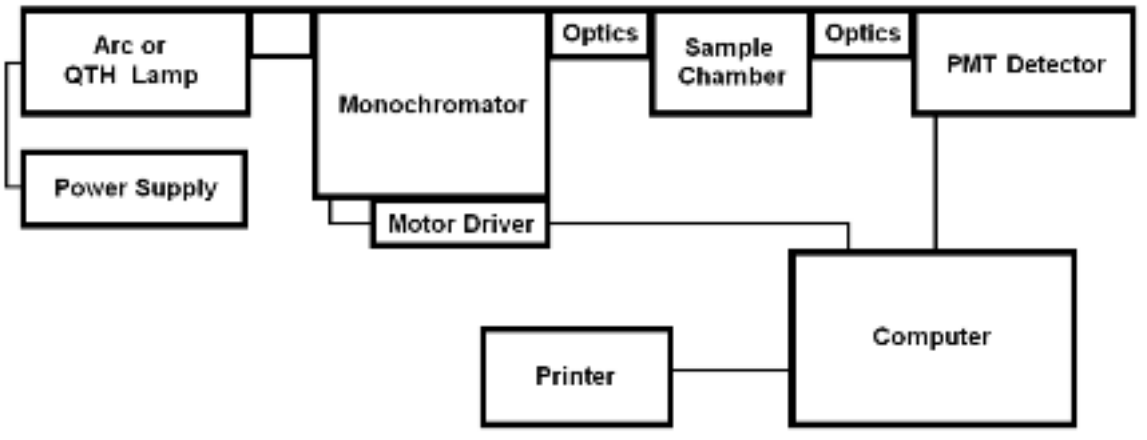
Ultraviolet / Visible Spectroscopy



Visible / Infrared Spectroscopy



Fluorescence / Phosphorescence Spectroscopy



Sciencetech Modular Instrumentation Systems

Sciencetech Instrumentation Systems are comprised of interchangeable modular units. These units are taken from Sciencetech's line of monochromators, light sources, detectors and accessories. Modular systems present many advantages to the user with respect to single systems.

Versatility

It is easy to change configurations and to add options to Sciencetech Modular systems. Sciencetech monochromators and sample chambers present multiple input and output ports. Dual detector modules and sources are also available. For example, if you are detecting sample emission at 90 degrees, you can easily change ports to look at the transmission at 180 degrees or even add an extra channel to monitor it continuously.

Easy to Upgrade

Sciencetech offers monochromators from 100 mm to 1 m focal length, both single and double configurations. Monochromators can be optimized for high resolution, high throughput, or both, and are offered in manual or motorized models. If your budget is tight, choose a low end option and upgrade as funds become available and performance requirements increase. For example, an initial system could detect visible light, and later be upgraded to ultraviolet and/or infrared detection.

One typical example of an upgradeable system is our Fluorescence Series. Most of our customers start with a set up for steady state fluorescence : Xe DC arc lamp, excitation monochromator (manual or motorized), sample chamber, emission monochromator and one photomultiplier detector. An easy upgrade to a T configuration can be done with a second detection channel. If the user later wants to add a florescence lifetime measurement, he can start by adding the options that allow measurement of lifetimes of a few microseconds, or go directly to the nanosecond version.

Tailored to User Needs

Sciencetech modular systems do what you need. In a standard integrated system, the custom must accommodate to the specifications of the instrument available. With Sciencetech systems the instrument will accommodate to the customer, allowing much better control over the parameters of experiments. You can have a custom-made system at the price of a standard off-the shelf unit.

Easy to Recycle

So, you do not need a Raman spectrometer any more? Instead of putting it aside, the individual sub-assemblies can be used separately for other purposes, even to assemble a completely new system. How about using those components as a top quality transmission spectrophotometer instead?

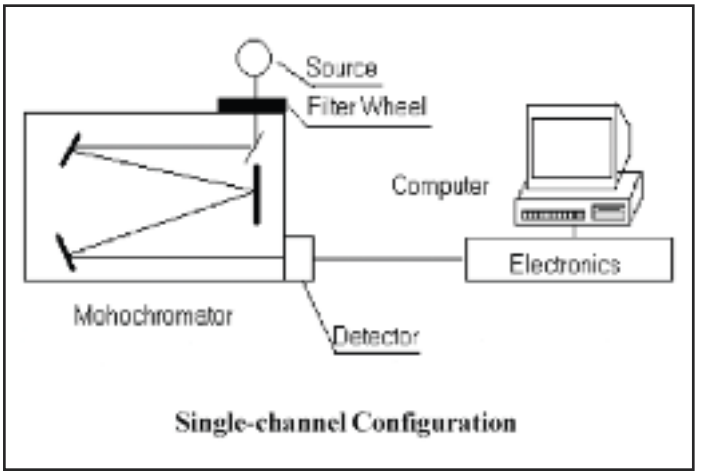
Sciencetech Customer Support

There is one disadvantage in modular system use: the selection of modules implies the user must be more knowledgeable about the instruments, their configuration and performance. Also, the units may be slightly more difficult to operate until you become familiar with them. Modular instruments are not, in general, “black box" systems. At Sciencetech, we are aware of this very valid concern and address it by making Sciencetech's highly qualified team of scientists and engineers ready to aid customers with any technical needs.

Sciencetech's team will help you with matching of components to your specifications. We will design the best configuration and answer any technical questions that you have. If you want to upgrade your system, or use the components for a different application, simply give us a call

Since we specialize in custom instrumentation, we will also design for you any unique components you may require. Our R&D department is always willing to listen to your needs. Our modular systems, coupled with any extra accessory that you may require, will leave you with a one of a kind system, tailored to your specific needs, and at a very competitive price.

Emission and Source Characterization



Single-channel Configuration

Emission and Source Characterization systems include a light source, filter wheel, monochromator and one of the following kinds of detectors: single channel or multichannel (PDA or CCD). Systems with CCD detectors are characterized as very sensitive and fast scanning devices. They can register a wide range of spectra at once.

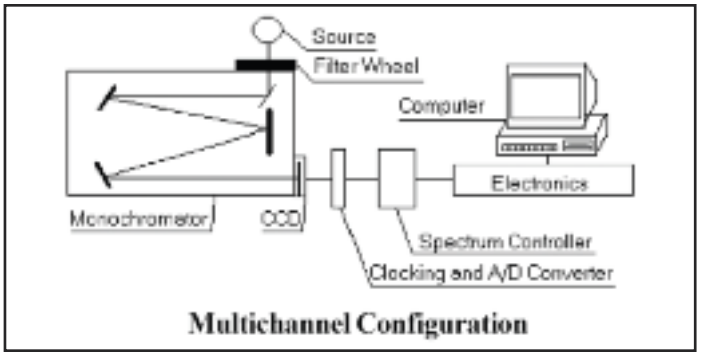
Different types of Sciencetech monochromators are used in Emission and Source Characterization systems, depending on the type of source being chosen and the necessary spectral resolution. A compact model of monochromator, either 9030 or 9072, with focal lengths of 100 and 150 mm, is suitable for low-resolution applications with a broadband light source and LEDs.

Sciencetech monochromators model 9040, 9055, 9056, 9057, 9490, with focal lengths in the range of 250mm to 1.5m, are recommended for high-resolution applications such as emission of atoms in plasma or the output structure of lasers.

Sciencetech's 250 mm focal length monochromator, model 9055, with two detectors can record a wide wavelength region. Two detectors with automatic switching, UV-Visible and Near IR regions respectively, are optional for all our monochromators and spectrographs.

Sciencetech monochromators work with first order diffraction. Systems with continuous light sources require a filter wheel to eliminate second and third order components. Sciencetech filters and filters wheels are described in section 6, page 15 - 21.

Various Si, Ge, HgCdTe, InSb, PbS, and InGaAs detectors are available from Sciencetech and cover the full range of wavelengths (from UV to FIR).



Multichannel Configuration

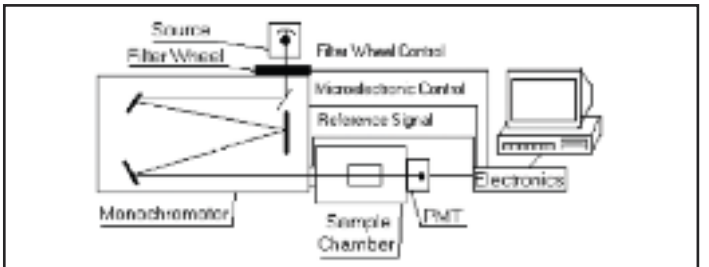
Absorbance, Transmittance, and Reflectance

Sciencetech systems for absorbance, transmittance or reflectance are assembled with light sources, filter wheels, monochromators, sample chambers and detectors from our line of off-the-shelf catalogue products.

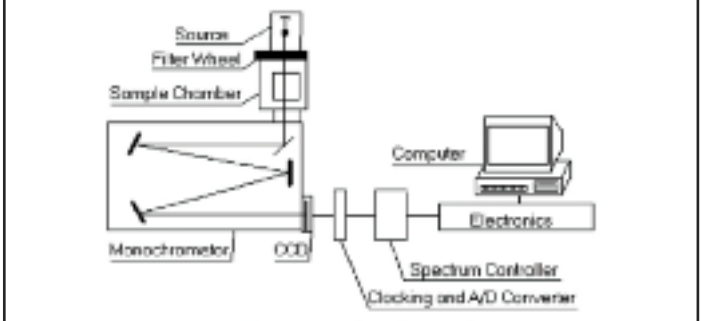
The systems with a compact 150mm focal length, using a 9072 monochromator, can be used for numerous applications in chemistry. Sciencetech models 9040, 9490 and 9150 models (with focal lengths 0.5m, 1m and 1.5m respectively) are recommended to produce high-resolution spectra.

A variety of detectors, such as Si, Ge, HgCdTe, InSb, PbS, and InGaAs are applicable for single channel configurations. Multichannel configurations with CCDs operate to 1100nm and fit perfectly for high-speed data acquisition. The extension of wavelength coverage can be achieved using systems with two automatically switch able detectors (manual or computer controlled).

Dual beam configurations are also developed in Sciencetech for quantitative analysis requirements in spectroscopic applications.

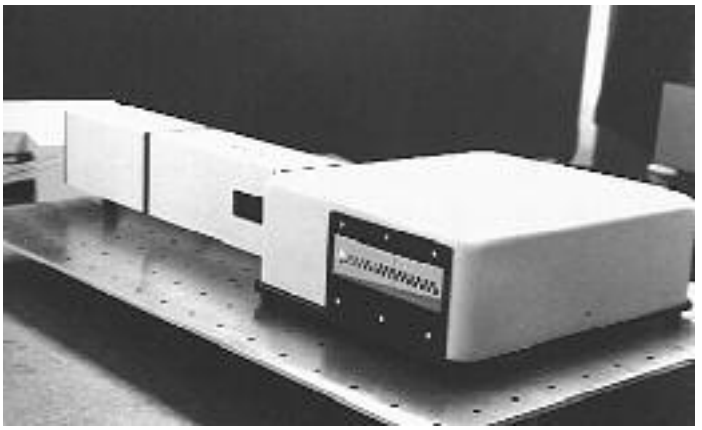


Single-channel Configuration



Multichannel Configuration

High Dispersion Spectrographic Illumination System Model S8040



The Sciencetech S8040 produces high power UVB, UVA and Visible illumination in a grid pattern. Each cell of the grid corresponds to a different wavelength, from the ultraviolet to the red with a standard bandpass of 12 nm.

One application for the S8040 is examining the effect of radiation on the skin with different wavelengths in the ultraviolet and visible spectrum. The dimensions are such that enough radiation is allowed to go through for each band to produce an effect on the skin for exposure times of 5 to 10 min. Simultaneous comparison of the effect on the skin of exposure to different wavelengths can be obtained. The excitation source is a Sciencetech 75 W Xenon arc lamp, model 200-180 housing with highly efficient reflective coupling optics. A light-tight spacer tube with filter drawers for narrow band selection connects the light source to the input slit of the 8040 spectrograph.

The S8040 spectrograph has a very wide flat field. It has an asymmetric, computer optimized, Czerny-Turner configuration with a grating of 1200 l/mm and input and output spherical mirrors with focal lengths of 200 mm and 300 mm respectively. A filter, positioned just before the focal plane, prevents light of unwanted orders from reaching the exit ports. The width of the input slit can be adjusted with a trade-off between resolution and throughput.

The standard model focuses the spectrum from 238nm to 624nm on a grid of 138 mm x 10 mm. The strip consists of two rows of alternate black and transparent rectangular cells, defined photolithographically on an antireflection coated chrome film on a quartz substrate. Each cell is approximately 4 mm wide and is designed to have a constant 12 nm bandpass. The cell height is 5 mm.

The limiting resolution of the spectrograph is 1 nm for a 1200 l/mm grating, much better than the 12 nm bandpass in a 4 mm cell, so if more discrimination is desired within a narrower range (for example: for UV only studies), a grating with more dispersion can be used and the spectral range selected. Optional gratings up to 3600 l/mm are available for the S8040.

Technical Specifications

High Efficiency Arc lamp System
- 75 W Xe lamp
- Arc lamp housing 200-180
- f/4.5 ellipsoidal reflector
- 5 times the coupling efficiency of a typical arc lamp system
- Water cooled housing
- Sciencetech 500-200 stabilized power supply and 500-IG igniter

Large Flat Field Spectrograph
Czerny-Turner design. Analytical plus ray tracing optimization.

Entrance spherical mirror:	
Focal length	200 mm
Focal number	f/4
Camera mirror:	
Focal length	304.8 mm
Dim.(mm)	54.5 (h) x 152.4 (w) mm
Exit focal number	f/6
Grating:	
Spacing	1200 l/mm
Size	50 mm

Optical resolution limit:
Better than 1nm through out the spectral range

Output grid:
Photolithographically defined quartz mask

Number of ports:	32
Spectrum width:	139 mm
Port height:	5 mm

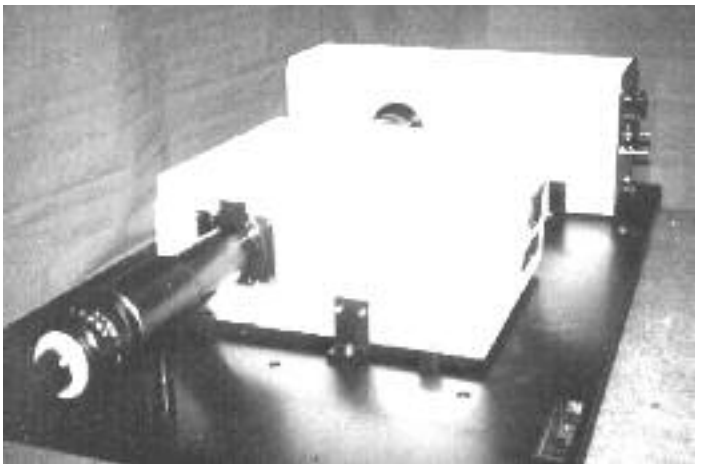
Port width according to dispersion: Average 4.3 mm
Spectral band per port: 12 nm

Input slit: Bilaterally adjustable width 0 to 5mm (20nm)
Adjustable height 0 to 10mm

Spectral range:	240-620 nm
Power at exit:	150 W/m^2 or 3 mW/port

Model	Description	Price (USD)
S8040	High Dispersion Illumination System	P.O.R

Very High Power Density Spectral Illumination Systems



The VHPSI (Very High Power Density Spectral Illumination System) is an optimized system with all of its components specially designed to provide maximum illumination.

The output is a very small, bright spot of selectable wavelength. It provides 1 mW of power in a 10 nm bandwidth onto a 100 µm focal spot. Standard spectral range is 400-700 nm.

System Components:

- High brightness 500 W Xe arc lamp. These are very small gap lamps (0.7 to 0.9 mm gap depending on the model).
- Sciencetech High Power arc lamp housing 200-1K for arc lamps over 300 W and refractive condensers. Includes a spherical mirror behind the bulb that projects the arc back onto itself for higher power. If desired, this can be removed for higher lamp stability, but results in reduced throughput.
- 500-1k DC stabilized arc lamp power supply and igniter.
- High power arc lamp condensing system with 2" optics. Includes achromatic optics for minimum aberrations. The input aperture is large for high light collection and the output is matched to the monochromator. A filter drawer allows mounting of 2" filters.
- Optional chopper (The input optics are prepared for chopper mounting).
- Sciencetech 9110 scanning fiber to fiber monochromator with input and output off-axis paraboloid mirrors. Monochromator is aberration free for point to point illumination. RS232 communication with computer.
- Standard grating: 300 l/mm blazed at 500 nm.
- Output pinholes.
- Exit telescope optics with 2" aperture. Includes iris, adjustable focus. Large exit focal number. Features TV camera type lens.
- Mounting table.
- Monochromator control software.

Technical Specifications

Power output: 1 mW per 10 nm bandwidth in a spot of100 µm diameter

Output Power Density: 1.2 W/cm^2/nm

Light source: 500 W high brightness Xe arc lamp

Power supply: DC stabilized. Ripple less than 0.5% peak to peak

Standard optimized spectral range: 400 nm - 700 nm

Monochromator optics: Czerny-Turner with off-axis paraboloid mirrors

Monochromator focal length: 209 mm

Grating: Standard 300 l/mm blazed at 500 nm

Dispersion: 14.4 nm/mm with 300 l/mm grating

Scanning: Manual or Motorized

Scanning resolution: 0.1 nm (for 300 l/mm grating)

Wavelength accuracy: 0.2 nm

Output optics aperture: Maximum f/0.95. Focusable. Iris aperture adjustment.

Output position: 3 cm from the output optics housing easy mounting of samples.

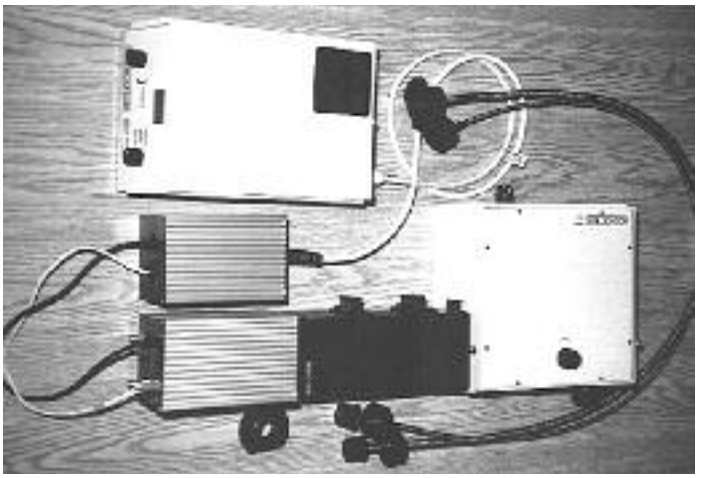
Exit pinholes: 400 µm and 1000 µm

Standard Filters: Schott GG385 1mm thick for measurements up to 450 nm. Schott GG420 3mm thick for measurements above 450 nm.

Options: Optical feed back unit for high stability, up to two gratings in monochromator turret for extended spectral range, filters, chopper, computer system, sample chamber, detectors, fiber optics and adapters

Model	Description	Price (USD)
VHPSI	Very High Power illumination System	P.O.R

Spectral Fiber Illumination System



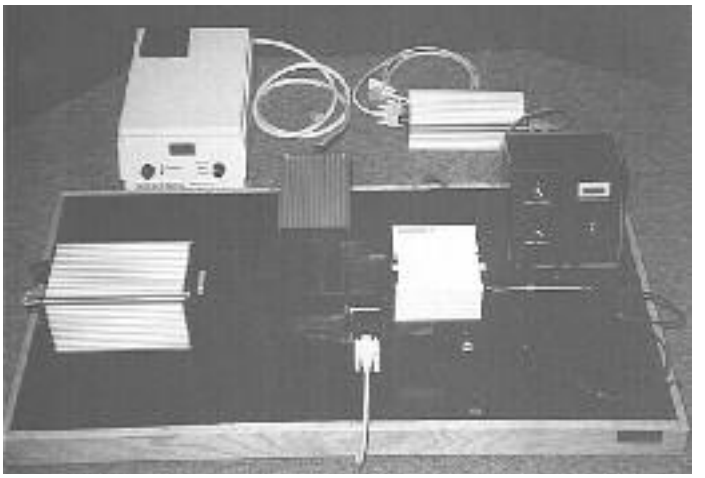
Spectral fiber illuminators are assembled using Sciencetech's arc lamps and monochromators. Arc lamps are excellent for coupling light into fibers due to their small arc. The most popular combination includes a 200 mm focal length monochromator with manual wavelength selection. One of its applications is as part of a system to measure transmission and fluorescence of a remote sample.

Standard system components:

- 150W Xe illuminator. It includes 150 W Xe arc lamp.
- Sciencetech 200-250 water cooled arc lamp housing with f/4.5 ellipsoidal reflector. Quartz window.
- Arc lamp power supply 500-200 and igniter.
- Optical spacer tube model CT for connection of 200-250 housing to any Sciencetech monochromator, with filter drawers for 1" and 2" filters.
- Optional dichroic hot mirror for infrared elimination.
- Fiber bundle adapter mount for CT spacer tube to connect optical fiber bundles directly to light source.
- Model 9010 monochromator. 200 mm focal length. For maximum resolution and throughput two gratings are recommended: 1200 l/mm blazed at 600 nm and 2400 l/mm blazed at 300 nm. Spectral range: 200 nm to 1.2 µm. Optical resolution 0.15 nm with 2400 l/mm grating. Fiber bundle adapter mount.
- Fiber bundles with circular to circular configuration or rectangular to circular configuration for better coupling of monochromator slit light.
- Optional adjustable coupling optics to optimize focusing on the fiber bundle.
- Focusable coupling optics to optimize output to optional sample chamber.
- Second order elimination filters.

Model	Description	Price (USD)
SFI	Spectral Fiber Illumination System	P.O.R

Photo - Corrosion System



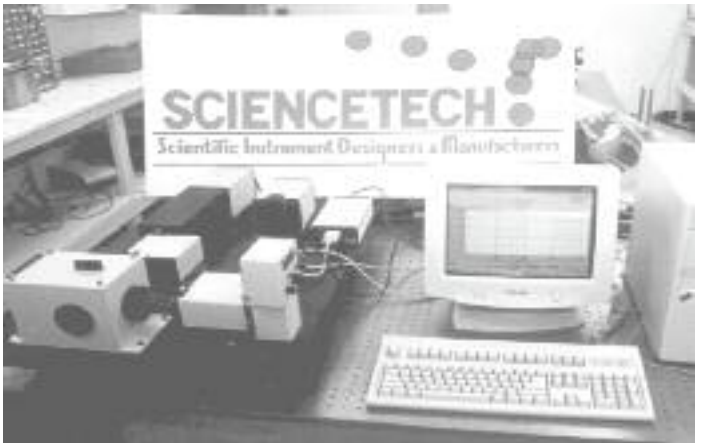
This system is used for electrochemical impedance spectroscopy and photoelectrochemical measurements of metallic coatings, such as Zn, for corrosion protection of iron or steel.

Standard system components:

- 150W Xe illuminator includes 150 W ozone free Xe arc lamp.
- Sciencetech 200-250 water cooled arc lamp housing with f/4.5 ellipsoidal reflector. Quartz window.
- Arc lamp power supply 500-200 and igniter.
- Optical spacer tube model CT for connection of 200-250 housing to any Sciencetech monochromator.
- 9030 monochromator (100 mm focal length) with concave holographic grating 1200 l/mm for 200-800 nm range.
- 8 fixed slits with widths from 50 µm to 5 mm. Optical resolution: 1 nm.
- Motor drive system with 200 steps per revolution, to the ability of microstepping. Minimum step size: 0.05 nm. Maximum scanning rate: 500 nm/sec.
- Photomultiplier tube PMT-02 for spectral range 185 nm to 870nm. PMH-02 room temperature PMT housing with integral high voltage power supply and read-out unit.
- Sciencetech C130 variable frequency chopper.
- Fused silica fiber optics. Mounts directly with SMA adapter on 9030 monochromator or through XYZ optics assembly below.
- XYZ optical assembly. Includes 1" quartz condensing system, filter drawer for 1" filters and mechanical light shutter. SMA adapter mount for single fibers. Attaches to 9030 monochromator.
- Long pass filters for second order elimination.
- Mounting table.

Model	Description	Price (USD)
Photocor	Photo-corrosion System	P.O.R

Fluorescence Spectroscopy



Model 7336 Steady State Fluorometer System

Fluorescence Spectroscopy is a powerful analytical technique with applications in biology, biochemistry, physics, chemistry and medicine. The upgradable capacity of Sciencetech Fluorometer systems provide the customer with the opportunity to begin with a low-end options and improve the system as requirements and funds increase.

Sciencetech currently offers two Steady State Fluorometer systems, models 7336 and 7556. Model 7336 is available only as a steady-state system. Model 7556 has upgrade options that include T-configurations, infrared detectors and florescence lifetime measurements in milliseconds, microseconds and nanoseconds. The standard Sciencetech Steady State Fluorometer system includes a light source, excitation monochromator, sample chamber, emission monochromator and detector.

Model 7336 uses the Sciencetech 9030 100 mm monochromator for both the excitation and emission monochromator components. The 9030 is a compact monochromator with a single concave holographic grating. Model 7556 uses Sciencetech's 9055, quarter meter monochromator for both the excitation and emission monochromator components. The 9055 is a high resolution instrument with a triple grating turret and automatic grating switching.

Light sources for Steady State Fluorometer systems are Xenon arc lamp systems. The 7336 and 7556 both use the SC3201 transmission/ fluorescence sample chamber and a photomultiplier detector system including photomultiplier housing with power supply and photomultiplier tube. A thermoelectric cooled PMT housing with temperature controller is also available.

Model 7556 includes a Reference UV-enhanced Silicon PIN fast photodiode for synchronization when pulsed sources are used. This component is offered as an option to the 7336. Both models include all coupling optics required for source, monochromators, sample chamber and detector. Data acquisition board and system control software are included with both systems. Other accessories and options such as optical breadboards and filter wheels are also available.

Basic System Consists of:

1. Xe arc lamp illumination system

2. Triple source coupling module with rotating mirror.

This couples the source to excitation monochromator. The Xe lamp is connected to one of the inputs. The other two are for attachment of flash lamps or other desired wide band sources. Quartz optics.

3. Excitation Monochromator

a. For 7336 system:

Our model 9030 is a compact 100 mm monochromator of Seya-Namioka type with a single concave holographic grating. Aperture is f/3.2 and the model comes with one set of fixed width slits.

- concave holographic grating 1200 l/mm for spectral range 200 to 800 nm
- manual grating control
- optical limit resolution 1 nm with 1200 l/mm grating
- reciprocal linear dispersion 8 nm/mm with 1200 l/mm grating

b. For 7556 system:

Our model 9055 direct drive monochromator is a Czerny-Turner type with an asymmetrical optical system. The triple grating turret is controlled by a computer through a RS232 serial port. Turret minimum step angle with 400 step/rev motor, is 0.0032^{o} in half-step mode and 0.00064^{o} in microstep mode. Concave mirror focal lengths are 200 mm input and 250 mm output. Input aperture is f/3.5. Slits have bilaterally adjustable width with micrometer control and adjustable height. Two slits are included with each monochromator.

- 1 holographic grating 2400 l/mm for spectral range 200-500 nm
- optical limit resolution with 2400 l/mm grating better than 0.25 nm from 200 nm to 600 nm

4. Reference UV enhanced Silicon PIN fast photodiode for synchronization for pulsed sources.

This photodiode is mounted near the source inside the excitation monochromator. This component is included in the 7556 system and is an option for the 7336 system.

5. Excitation reference/coupling unit to sample chamber/laser port module.

This unit includes a beam-splitter quartz plate to send signals to a reference normalization photodiode. It also includes a port accessible through a flipping mirror for laser excitation. All quartz optics.

6. Sample chamber for fluorescence systems.

- "T" box sample chamber for possibility of adding a transmission channel with XYZ stage for sample aligning.
- Off-axis toroidal reflective optics.
- Angle between excitation and emission is 90°.

7. Emission monochromator

a. For 7336 system: Please see description above for further details of this component.

- concave holographic grating, 1200 l/mm, for spectral range 200 to 800 nm
- manual and automatic grating control. Stepping motor drive with microstepping capabilities. RS232 communication with computer.
- minimum step size of 0.06 nm
- optical limit resolution 1 nm with 1200 l/mm grating
- reciprocal linear dispersion 8 nm/mm with 1200 l/mm grating

b. For 7556 system: Please see description above for further details of this component.

- 2 holographic gratings, 1200 l/mm and 600 l/mm, for spectral range 0-1200 nm
- optical limit resolution with 1200 l/mm grating is better than 0.5 nm from 400 nm to 1.2 µm, and with 600 l/mm grating is better than 1 µm from 1 to 2.4 µm

8. Dual detector housing with optics for coupling to PMT and infrared detector. Flip-in mirror detector selection.

This component is included with 7556 system. 7336 system tube with optics.

9. Photomultiplier detector system.

Includes R928 PMT in standard non-cooled housing with high voltage power supply.

10. Computer system.

Windows compatible PC and monitor, printer, standard A/D board for data acquisition. RS232 and USB ports. This component included with 7556 system. Offered as an option for the 7336 system.

11. Software

- Detectors; data acquisition drivers.
- Control of the monochromators: scanning, speed, full spectra, or point by point.
- Excitation and emission spectra observation window.
- Data manipulation; Normalization, add, subtract, divide, multiply spectra. Baseline correction.
- Gaussian addition.

12. Mounting table

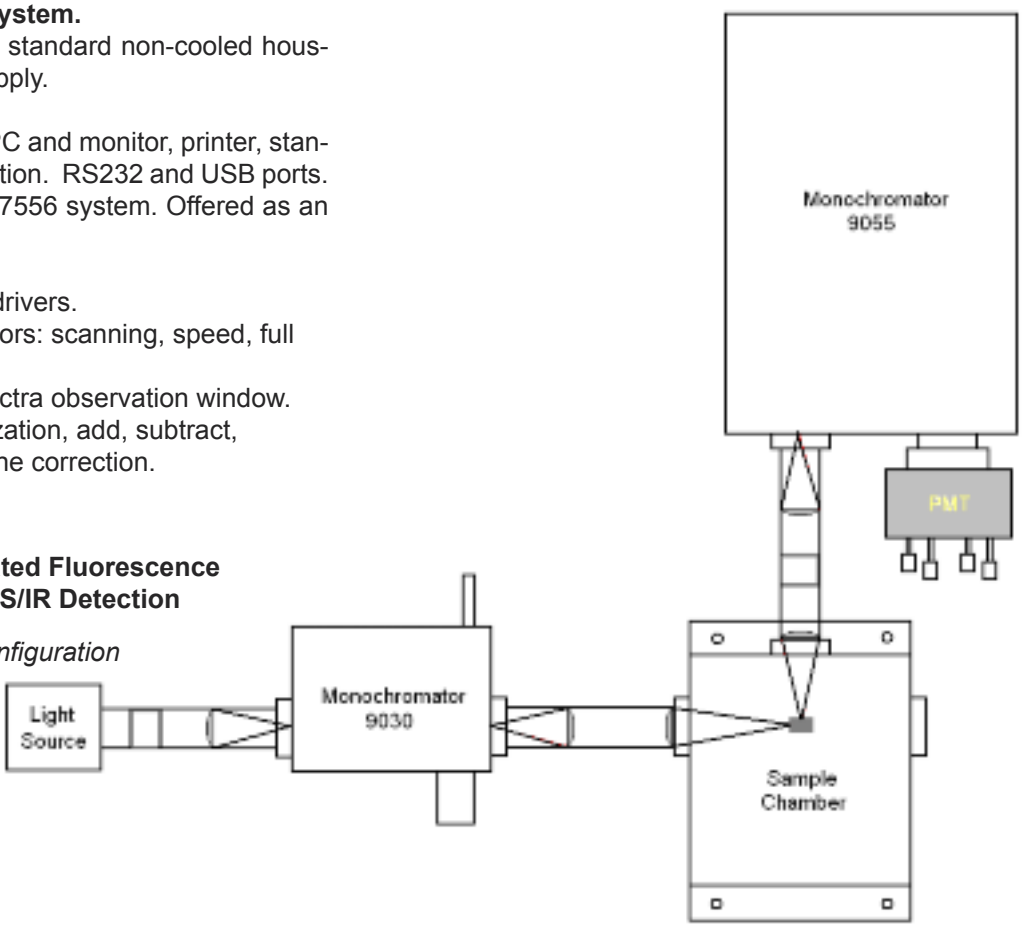
Additional options such as extra slits and gratings, filter wheels, optical tables and motor control of monochromators can be found in their respective sections of this catalogue. Please contact Sciencetech if you have any questions about options or inquiries into customizing your system.

Some upgrades are available for the 7556 system only. These upgrades are described on the following page. Contact Sciencetech for pricing.

Model	Description	Price (USD)
7556/u	Upgradeable steady state fluorometer, as described	P.O.R
7336	Basic Steady state fluorometer, as described (not including computer system)	P.O.R
	Basic 7116 Steady state Fluorescence system	P.O.R
7556	Basic 7556 with reference channel and computer control of both monochromators	P.O.R

Steady State integrated Fluorescence System for UV/VIS/IR Detection

Top View Configuration



Upgrade options for steady state fluorometer system 7556

1. Infrared Detection System Includes:
Lead Sulphide detector system for 1-3 µm with two-stage thermoelectric cooler. 3 x 3 mm active area detector, pre-amplifier, heat sink, temperature controller, power supply, housing and mount for fluorometer above, electronics for computer data acquisition, lock-in amplifier (Single-phase lock-in), variable frequency chopper (C130) (includes 3 blades: 2, 5 or 10, and 30 sectors)

2. Phosphorimeter. For lifetimes of milliseconds
In this stage the steady state source is replaced by a flash lamp in the secondary input port. The minimum response is defined by the speed of the converter (30kHz), which allows lifetimes of approximately 200-400µs. Selection of high energy pulses (2.5J and up to 25Hz repetition, ~10µs) or low energy (25mJ, and up to 2000Hz, 500ns). The same photodiode used for the steady state mode is used for the synchronization signal for the capture electronics.
Includes:
• UV 60 W Xenon flash lamp with fused silica window lamp housing, power supply and controller.
• Electronics, including bias and preamplifier electronics for the PIN.
• Fast A/D board to replace standard A/D.
The Xe lamp can be used for µs fluorescence excitation

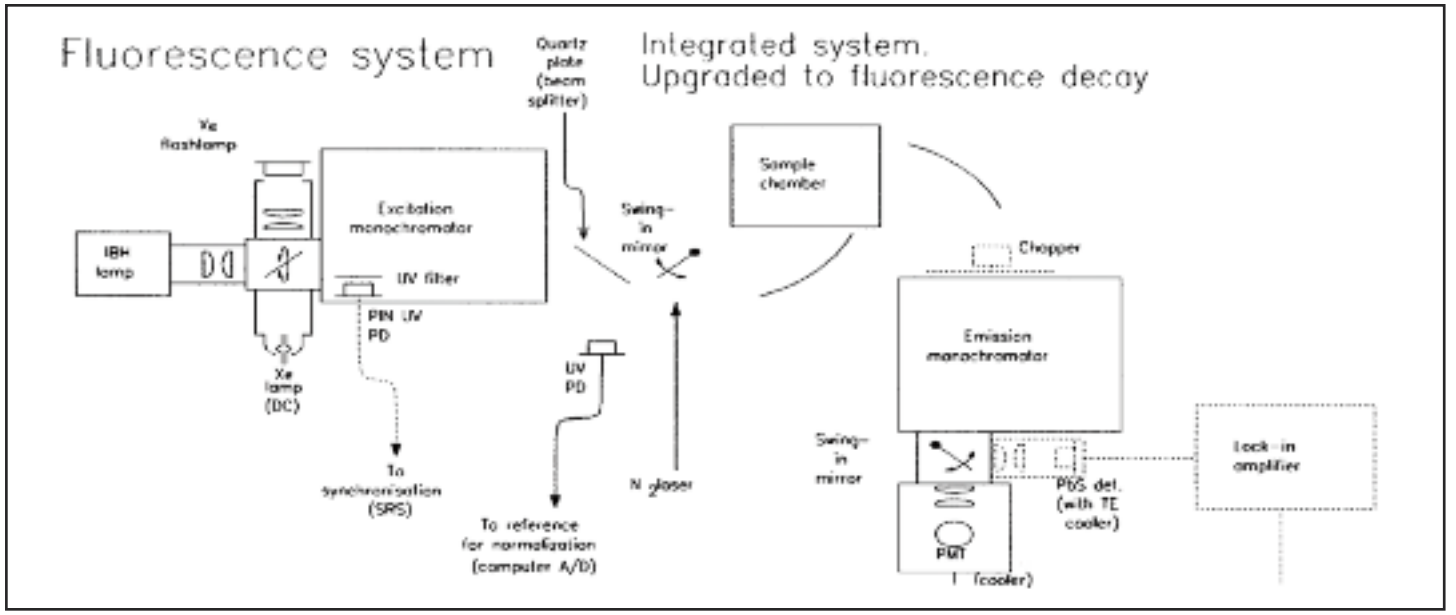
3. Up to ~1 µs fluorescence
This stage requires the replacement of the detection electronics with a faster system. The same photomultiplier can be used without replacement.
Choose one of the three options: (software & integration into system is included with each option).

Option 1: Analog boxcar system
• gated integrator module
• quad 300 MHz preamplifier

Option 2: Photon counting boxcar system
This is the recommended system for low light levels, since longer time accumulation is possible.
• Discrimination > 5 ns
• Pulses per channel < 109
• Number of channels < 2000
• dual channel gated photon counter
• quad 300 MHz preamplifier for photon counters
• high sensitivity photon counting photomultiplier tube (to replace standard PMT)

Option 3: Photon counter multichannel system
• Discrimination > 10ns
• Pulses per channel < 32K
• Number of channels < 16Ks
• 5 ns multichannel scaler
• quad 300 MHz preamplifier for photon counter detectors
• high sensitivity photon counting photomultiplier tube (to replace standard PMT)
Any of these electronic setups can be used for nanosecond and fluorescence measurements (stage 4)

4. Nanosecond fluorescence system
• A third source with slit focusing optics with XYZ arc adjustment added to the system above (thyratron gated flash lamp), or pulsed laser to input through the laser port.
• For operation below ~50ns, the PMT housing electronics must be upgraded: taper voltage divider, shorting (bypass) the last electrodes, and snubber circuit.



Spectroradiometer System for Spectral Characterization of Detectors

Sciencetech offers complete modular spectroradiometric systems which include a Sciencetech light source, automatic monochromator, filter wheel and calibrated detector. The systems are fully integrated and calibrated, featuring very high light throughput and minimal stray light.

These high performance modular integrated systems allow spectral characterization and calibration of ultraviolet, visible and near infrared detectors, including CCDs.

High stability, high ultraviolet output Xenon arc lamps are used as UV and visible sources. The near and middle infrared wavelengths are provided by a tungsten-halogen source with a stabilized power supply. An optional dual source unit with automatic switching is also available with the switching wavelength controlled by the software. Selection between the high brightness Xenon lamp and smooth output QTH is possible in the mid infrared region, depending on experimental needs.

The Sciencetech motorized 1/4 meter monochromator used in this modular system has three (model 9055) or four (model 9056) gratings, allowing an extended wavelength range with automatic grating switching. An associated motorized filter wheel eliminates high diffraction orders produced by the monochromator. Light coupling of the different components is optimized with aspheric reflective optics and light tight construction.

The radiometric system includes an integrating sphere with a reference detector at the sphere output port and monochromator at the input port. If preferred, the output of the monochromator can be linked to a bifurcated type fiber optic bundle for remote measurements.

Complete control of the system is through one RS232 port to a PC computer via 12 or 16 bits data acquisition board. The SciSpec software package is provided for control of the system and graphical display of the detector read-out.

Technical Specifications

Spectroradiometer System Components
Light source:
150 W arc lamp system : Sciencetech 200-250 arc lamp (pages 3-10, 3-13, 3-20) housing, Model 100-150X/UV 150 W Xenon arc lamp, Sciencetech 500-200 radiometric arc lamp power supply, 500-IG igniter for arc lamp source.
Optional second source: 100 W QTH source, Stabilized (page 3-24) power supply, TH2/s housing with HDT300 automatic source selection. Dual source detector characterization from 200 nm to 3.5 mm
Sciencetech CT/W: Coupling of light source to (page 3-14) monochromator, Connection for motorized filter wheel.
Sciencetech 271-REC: Water recirculation for water (page 6-8) cooled source.
Sciencetech 9055 or 9056: Automatic 1/4 meter (pages 4-17 and 4-20) monochromator (3 or 4 gratings)

Toroidal reflective optics: f/# matching and astigmatism correction.
Sciencetech FWG-6: Computer controlled filter wheel, (page 6-19) filters not included.
SciSpec Software: Control of wavelength, grating (page 6-32) switching, filter wheel, source selection, detector read-out, and data analysis.
A/D-12 OR A/D-16: 12 or 16 bit (page 6-31) computer data acquisition board.
Reference Detector: SI-UV-S Si calibrated (page 5-4) photodetector head. Integral pre amplifier (for wavelengths up to 1050 nm) UV enhanced with electronics and power supply.
Mounting board
Optional integrating sphere

Performance Specifications:
Spectral Range: 180-2500 nm
Monochromator Light Output: Greater than 10 mW at 500 nm for 15 nm bandpass.
Dynamic Range: 12 or optional 16 bits.

Description	Price (USD)
Spectroradiometer system with 9056 and single Xe source	P.O.R

Scanning Spectrophotometer Systems

Sciencetech modular spectrophotometer systems are assembled with Sciencetech monochromators, light sources and detectors. Computer interfaces and a comprehensive software package make these units more powerful than most integrated spectrophotometers, with the added advantage of modularity for easy upgrading. The systems described below are just a few of our more popular combinations. Many other alternatives are available featuring low to very high resolution, middle ultraviolet to middle infrared spectral ranges, single or multiple detectors, etc.

950 Series Scanning UV/VIS/IR Spectrophotometer System

The 950 series of spectrophotometers from Sciencetech are high performance modular systems and are specially designed for research applications. Easy assembly and setup, high automation and user friendly software also make the systems attractive to any user that requires high performance and easy upgradeability. The fast and simple upgradeability lets the user transform a simple single beam UV/VIS spectrophotometer into a diffuse reflectance system, into a dual beam UV/VIS/IR, or even use the components to assemble a high performance fluorometer.

In the Sciencetech 950, modularity is no sacrifice to performance: high spectrophotometric sensitivity, low stray light, high resolution, multiple accessories and user friendly software are some of the features.

The core of the spectrophotometer is the Sciencetech 9055 automatic monochromator, a 1/4 meter instrument with high resolution for an instrument of this size. The 9055, together with its companion, the Sciencetech FWG-6 automatic filter wheel, provide wavelength selection and scanning. The 9055 comes with three gratings for efficient wavelength coverage from 180nm to 2500nm. The FWG-6 includes all the necessary filters to eliminate unwanted wavelengths. The filter and grating switching wavelengths come preprogrammed, but the user can alter the setup files if desired.

Sciencetech 950 spectrophotometers include up to two sources and two detectors with automatic switching. As with the filters and gratings, the switching wavelength comes preprogrammed, but the user can easily modify these. Photomultipliers, Si, Ge and PbS detectors are available for the 950. The standard version 950 features a UV enhanced Si and a PbS detector for coverage from 200 to 2500nm.

There are many sample chamber options for the 950 series. The standard 950 system is a single beam system with a SC3200 sample chamber that includes an extra port for fluorescence measurements. The SC3200 includes accessories for thermoelectric cooling and heating, magnetic stirrer, flow-through and HPLC etc. The fiber optic option allows remote measurement of samples. A dual beam system 950/D includes beam splitting optics and the 3900 dual sample chamber module. Diffuse reflectance and transmittance measurements are possible with the diffuse reflectance attachment with an 8" integrated sphere.

Sciencetech spectrophotometers include SciSpec, our in-home software. The user does not have to remember commands or have a manual next to the instrument in order to be able to use it.

Technical Specifications

Monochromator: Sciencetech 9055, triple grating Czerny-Turner monochromator

Gratings: UV: 2400 l/mm blazed at 250nm (holographic)
VIS: 1200 l/mm blazed at 500nm
NIR: 600 l/mm blazed at 1.25µm or 300 l/mm blazed at 1.25 µm

Grating size: 50 x 50 mm

Optics: All reflective optical system

Light sources: Dual source, Tungsten-Halogen, quartz window, Arc lamp

Detectors: Photomultiplier system (185-900nm) UV enhanced Si detector, PBS detector

Limit resolution: UV (180 to 400 nm) < 0.08nm
Visible (400 nm to 1µm) < 0.15nm
NIR 600l/mm (1µm-2.5µm) < 0.4nm
NIR 300l/mm (1µm-3.3µm) < 0.8nm

Wavelength range: 185-2500nm (if 600 l/mm selected)
185-3300nm (if 300 l/mm selected)
Down to 175nm with Nitrogen purging.

Wavelength Accuracy (nm): UV-VIS 0.1nm
NIR 0.4nm

Wavelength Reproducibility (nm): UV-VIS 0.02nm
NIR 0.08nm

Scan Type: tepping motor driven grating, grating switching and filter changes. Microprocessor controlled with microstepping.

Minimum wavelength scan step size(nm) (Data interval)

UV	0.0125
VIS	0.025
NIR (600 l/mm grating)	0.05
NIR (300 l/mm grating)	0.1

Band Pass: Continuous selectable. Input and output slits with manual micrometer controller. Slit width from 0 to 6 mm. Minimum division 10µm.

UV	0 to 10 nm
VIS	0 to 20 nm
NIR (600 l/mm grating)	0 to 40 nm
NIR (300 l/mm grating)	0 to 80 nm

Optional computer controlled input and output slits.

Motorized slits (optional) :

Step size: 2.5µm. Minimum bandpass corresponds to:

UV	0.004nm
VIS	0.008nm
NIR (600 l/mm grating)	0.016nm
NIR (300 l/mm grating)	0.032nm

Maximum scan rate (On the fly scans) (nm/min):

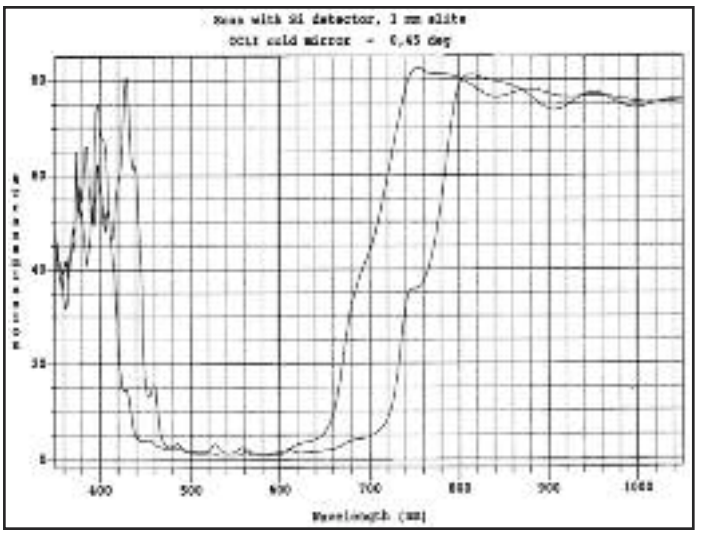
UV	4500
VIS	9000
NIR (600 l/mm grating)	18000
NIR (300 l/mm grating)	36000

Maximum scan rate (Standard scans) (nm/min):

UV	1200
VIS	2400
NIR (600 l/mm grating)	4800
NIR (300 l/mm grating)	9000

Slew rate (nm/min) (changing between wavelengths):

UV	9000
VIS	18000
NIR (600 l/mm grating)	36000
NIR (300 l/mm grating)	72000



Noise: better than 0.0001 absorption units

Dynamic Range: 12 bits standard, 16 bits optional

Scan Modes: Scan time drive, Wavelength, Energy

Scan Mode Units: Wavelength (nm), Energy (eV) . Absolute or Relative

Scan Display: Direct (counts) absorbance, transmission, sample, and reference

System requirements:

PC with RS232 serial communication port for monochromator control and expansion slot for data acquisition card.

Computer control: via RS232 port

Detector read-out: A/D 12 bits (optional 16 bits)

Overall instrument dimensions: 1000x600x200mm

Electrical requirements: Main supply of 100/120 or 220/240 Volts AC. 50 or 60 Hz

Ordering Information:

Second Number: monochromator

5 - Model 9055
3 - Model 9030

Third Number: light source

1 - QTH only
2 -Dual QTH and Deuterium
6 - Xenon arc source

Detectors:

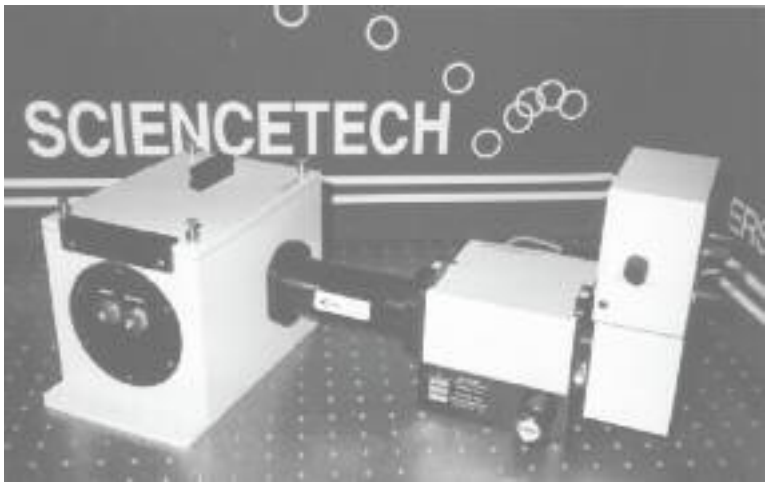
U - UV enhanced silicon detector
P - photomultiplier
I - PbS detector
N - Germanium detector

Dual Beam:

D- (before model number)

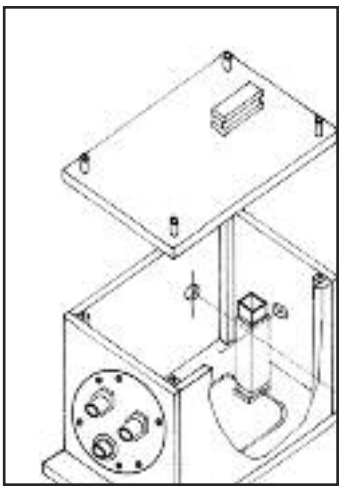
Diffuse reflectance: /R
Fiber Optic: /F
Temperature Controlled: /T

Model	Description	Price (USD)
952-UI	UV-VIS-IR high resolution scanning spectrophotometer with dual detector,dual source	P.O.R
952-P-D	UV-VIS high resolution scanning spectrophotometer, photomultiplier detector Dual Beam	P.O.R



Sciencetech Model SC3200 Sample Chamber

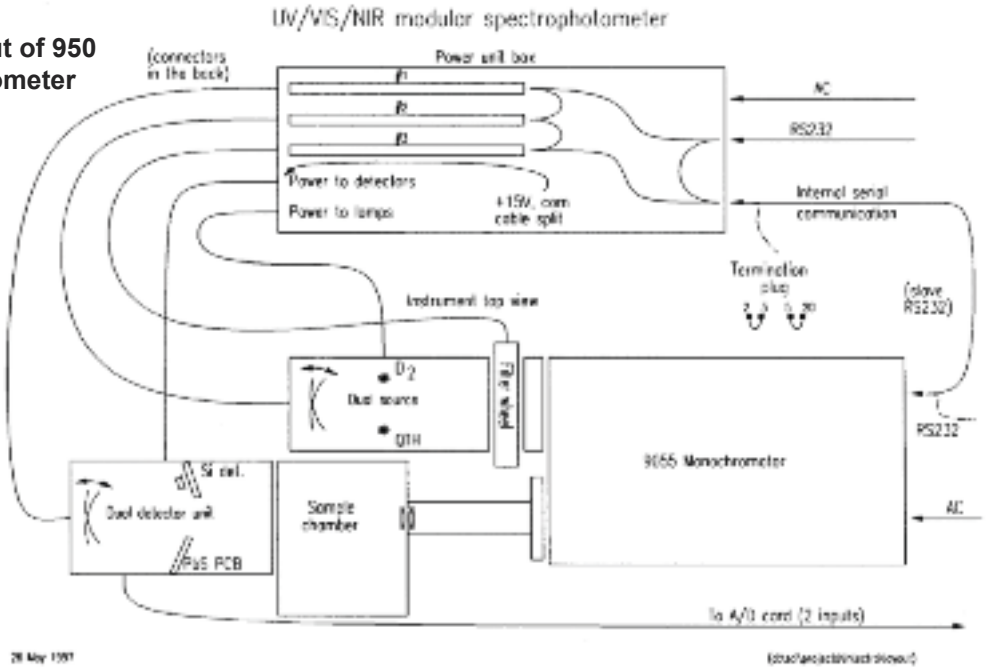
Sciencetech SC3200 sample chambers have T optical arrangement, with one input and two output ports and can be used for fluorescence, transmission or scattering measurements. Models available with one sample holder or carousel for up to four 10mm standard cuvettes. Model SC3220 is prepared for HPLC flow-through cells. Samples are easily inserted through the top lid. A wall in chamber contains a supply panel for any required electronics.



Fiber Optic Assembly
Optional fiber optic assembly for remote samples.

Integrating Sphere
Optional integrated sphere assembly for diffuse reflectance samples.

Physical Layout of 950 Spectrophotometer



936 Spectrophotometer System

Sciencetech 936 Spectrophotometer System is offered as an alternative to the 950. The 936 is available in both standard and VIS/IR options. The 936 system includes the Sciencetech model 9030 monochromator. The 9030 is a compact and rugged monochromator of Seya-Namioka type with a f/3.2 aperture. A motorized option with RS232 computer communication is also available.

The standard source for the 936 system is a 75 W Xenon arc lamp. A QTH source is used for the VIS/IR option. A Si detector head with preamplifier is the standard detector. A dual Si/InGaAs detector is used in the VIS/IR option. The SC3200 Transmission/Reflection sample chamber is included in both the standard and VIS/IR versions.

936 System Components:

- 75W Xe arc lamp in 200-180 housing power supply and igniter.
- CT Spacer tube for coupling arc house to 9030 monochromator
- 9030 monochromator with motorized option. RS232 communication with computer.
- Optical Coupling tube 9030 monochromator (f/3.2) to sample chamber
- Transmission/Fluorescence sample chamber.
- Si detector head with preamplifier
- A/D data acquisition board
- Mounting table.
- Integrated Software for monochromator control and detector data acquisition.

Vis/Infrared option:

- Replace Xe lamp with quartz halogen (QTH) light source.
- Dual detector Si/ InGaAs.

Options for Sciencetech 936 Spectrophotometer

1. Software

- Data manipulation software: addition, subtraction, multiplication and division of spectra, as well as averaging, statistics, and calibration routines.
- Kinetics software: real time measurements, and statistics.

Spectral ranges and resolutions available with the 936 system

Type	Range	Optical Resolution	Minimum Scanning Step
UV/VIS	200-800 nm	1 nm	0.05 nm
VIS	350-800 nm	1 nm	0.05 nm
UV/VIS/NIR	300-1100 nm	1.5 nm	0.075 nm
VIS/IR	400-1600 nm	2 nm	0.1 nm
IR	800-3200 nm	4 nm	0.2 nm

2. Cells

- 10 mm optical path cuvettes (quartz)
- Thermostable cell holder. Electronic temperature control of sample and reference
- High pressure hyperbaric sample chamber
- Electronic shutter at input or exit ports with controller activated by the camera lid, to avoid light reaching the detector when the lid is open.

3. Detectors

- Standard Si detectors can be replaced by photomultiplier tubes in either room temperature or cooling housing.
- Dual detector housing
- Large assortment of infrared detectors. Room temperature, thermoelectric cooling or liquid nitrogen cooling.

4. Computer system

- Computer with Windows OS, including monitor, mouse, keyboard, etc.

Ordering Information:

Second Number: monochromator
5 - Model 9055
3 - Model 9030

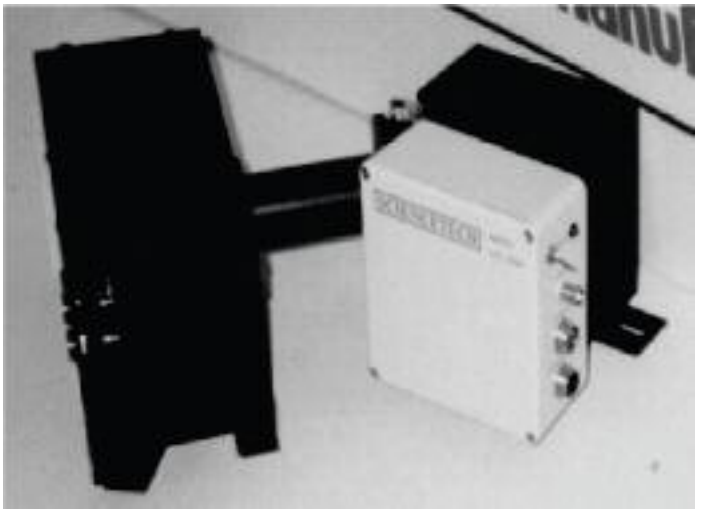
Third Number: light source
1 - QTH only
2 - Dual QTH and deuterium
6 - Xenon arc source

Detectors:
U - UV enhanced silicon detector
P - photomultiplier
I - PbS detector
N - Germanium detector

Dual Beam: D- (before model number)
Diffuse reflectance: /R
Fiber Optic: /F
Temperature Controlled: /T

Model	Description	Price (USD)
932-U	Spectrophotometer with UV enhanced Si detector	P.O.R
932-P	Spectrophotometer with photomultiplier detector	P.O.R
D-931-P	Dual beam spectrophotometer with QTH source	P.O.R
D-932-P	Dual beam spectrophotometer with dual QTH D2 source	P.O.R
D-936-P	Dual beam spectrophotometer with Xenon arc source	P.O.R

Sciencetech 830 Series UV-VIS Photodiode Array Spectrophotometers



Sciencetech QTH source with 8030 spectrograph and LDA2000 detector (831 system)

Sciencetech 830 series spectrophotometers include a light source, sample chamber, spectrograph and detector. The Sciencetech 832 UV-VIS Photodiode Array Spectrophotometer is a modular spectrophotometer based on a linear diode array detector system. This detector system allows each element to detect a different wavelength. The 832 has a spectral range of 109-1100 nm and an excellent wavelength accuracy.

The Sciencetech dual source module with Deuterium and Tungsten (QTH) bulbs provide light from 190 nm to 1100 nm. Highly stabilized power supply and dichroic filter for recombination are also included. The detector system is the Sciencetech model LDA-2000 photodiode array with 1024 elements and 25 µm pitch. The LDA-2000 provides 1" coverage and wavelength resolution of 1 nm. The detection system includes all electronics and data acquisition board for PC compatible computer.

The Sciencetech model 8030 Spectrograph is a compact and rugged unit with a concave holographic grating for spectral range 190 nm to 1050 nm. The 8030 disperses the light transmitted by the sample and focuses it into the LDA-2000 detector. The 8030 allows point-to-point imaging over an area of up to 25 x 4 mm.

The standard sample chamber for 830 systems is the Sciencetech model SC3201/M transmission/fluorescence sample chamber with T optical arrangement. The unit includes one input and two output ports. The chamber holds 10 mm standard cuvettes and includes a holder for 100 mm rectangular cells and cylindrical cell holder.

LDA-2000 Windows-based software package is included with the system for spectrograph with multichannel detector grating. The software controls the instrument as well as data collection, manipulation, storage and retrieval.

Technical Specifications

Wavelength Accuracy: < ±0.5 nm
Minimum Scan Time: 0.025 sec
Max. Exposure Time: 10 sec
Photometric Noise: <0.0002A in 100 scans at 500nm
Baseline Flatness: 0.001A in a single scan

832 System Components:

- dual light source module, 30 W Deuterium source, 50 W QTH source, dichroic filter, power supply, all quartz coupling optics for sample chamber.
- SC3201/M transmission/fluorescence sample chamber
- CO-CM/q optical coupling tube with quartz optics
- 8030 Spectrograph with one concave holographic grating.
- LDA-2000 photodiode array, including detector head, all electronics and data acquisition card.
- LDA-2000 control software package featuring real time display of signal, acquisition, display and storage of multiple spectra, burst mode for high speed data acquisition.

Minimum computer requirements are: IBM compatible PC with Pentium processor running Windows 95, 16 MB RAM, 1.2 GB hard drive, SVGA graphics card and monitor.

Options for 830 series Spectrophotometers

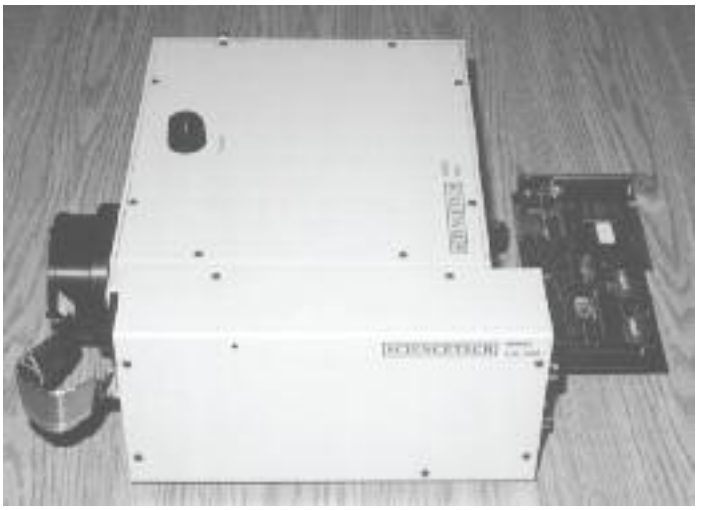
- Light Sources - QTH and Xenon light sources are available for 830 systems; QTH - 831 system, Xenon - 836 system.

- Fiber optic connections for remote sampling (outside sample chamber) - includes fiber mount with SMA type connector for source light output, matching optics, connector for spectrograph input, and two 1 m quartz fibers with SMA connectors.

- Sample Chamber Accessories - including Peltier cooled sample platform for temperature control between 10-100°C, temperature controller, computer control and interfacing. Built-in magnetic stirrer.

Model	Description	Price (USD)
832	Photodiode Array Spectrophotometer (as described above)	P.O.R
	Fiber Optics	P.O.R
	Sample Chamber Accessories	P.O.R

SCI 816 DIODE ARRAY SPECTROPHOTOMETER



8010 Flat Field Spectrometer coupled with LDA 2000

Sciencetech's SCI 816 is a single beam, ultraviolet and visible spectrophotometer with a spectral range from 190 to 820 nm. It is based on a linear diode array detector system, with each element detecting a different wavelength. No rotation of the diffraction grating is involved: the different wavelengths are collected simultaneously. The instrument is controlled from a host PC.

The Xe light source produces high intensity continuous illumination from 200 to 800 nm. Optional filters can be mounted in the filter drawer. The sample chamber can accommodate solid or liquid samples in standard 10 mm cuvette (a demountable cuvette holder is included). A flat field spectrograph disperses the light transmitted by the sample and focuses it into the LDA2000 detector.

- 75W Xe arc lamp in 200-180 housing power supply and igniter.
- Spacer tube CTC for coupling arc house to sample chamber.
- Transmission/Fluorescence sample chamber
- Optical coupling tube, sample chamber to f/3.5 monochromator
- 8010 flat field monochromator
- LDA 2000 linear diode array detector, computer interface and software.
- Mounting table.
- Windows compatible computer (not included)

Model	Description	Price (USD)
816	Multichannel Spectrophotometer	P.O.R

Technical Specifications

Main features of the 816:

- Photodiode array with 1024 elements, each 25µm wide and 2.5mm high.
- Variable integration time.
- Large sample chamber equipped with a standard cell holder that accommodates 1cm cells.
- PC plug-in controller card.
- Menu driven standard scanning software with graphics display. Displays spectral information, integration time control, display control, file storage, and retrieval. Source code is included with the system to allow you to customize as you wish.
- Calculation of Transmittance and Absorbance.
- Optional analysis and data manipulation software.
- Variety of optional cells, including temperature control.

Gratings: Up to two gratings mounted in turret. User selectable center wavelength

With 200 l/mm grating

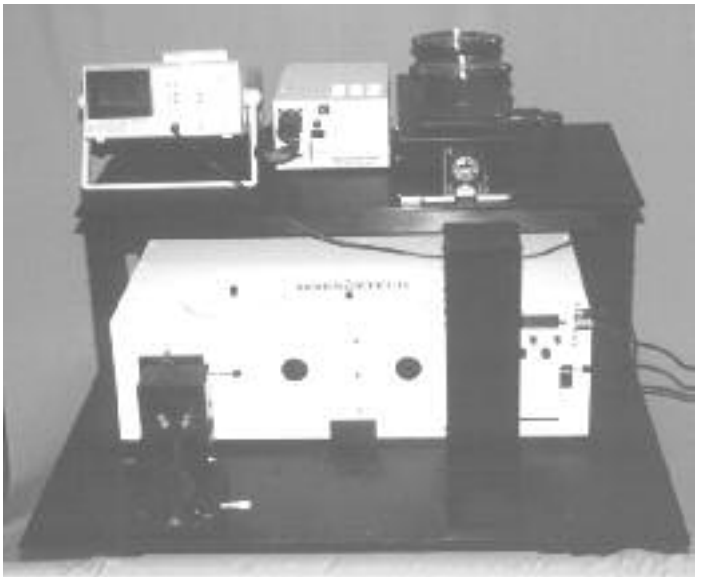
Wavelength Range:	190 to 820 nm
Spectral bandwidth:	0.6 nm
Dispersion:	24 nm/mm

With 1200 l/mm grating

Wavelength bandpass:	102 nm
Spectral bandwidth:	0.1 nm
Dispersion:	4 nm/mm

Wavelength accuracy:	± 1 nm
Wavelength Reproducibility:	± 0.05 nm
Stray light level:	Better than 0.05%
Selectable Scanning time:	0.042 to 3 sec
Photometric range:	0-3 absorbance units 0 to 100% transmission
Photometric precision:	0.001 absorption units
Computer requirements:	Windows compatible with at least a Pentium processor,
Lamp:	75 W Xenon
Line voltage:	Either 110 or 220v
Options for 816:	100 W Quartz-halogen light source for spectral range 350 nm to 1100 nm. Dual source module Xe-QTH or D2 (deuterium)-QTH

Raman Spectrometers



Raman spectroscopy and Infrared (IR) spectroscopy are the two primary techniques to determine the vibrational modes of molecules. To a large extent these are complementary in that they measure two distinctly different physical phenomena. Infrared spectroscopy involves the measurement of absorption of light corresponding to transitions between the molecular energy levels of the vibration modes of molecules. In Raman Spectroscopy a monochromatic visible light beam is scattered by the molecules. This scattered light is measured with a suitable spectrometer, usually at 90 degrees to the incident beam. A change in the scattered frequency with respect to the source is related to the vibrational frequencies of molecules. At the very most, the intensities of Raman lines are 0.001 % of the source. Lasers are the standard sources with Argon ion lasers being the most commonly used. Sciencetech offers several Raman spectrometers suited for different needs and budgets, ranging from single channel double monochromators to multichannel, triple monochromator systems with versatile multimodal instruments.

Model	Description	Price (USD)
RM9040-DA	Full Raman Spectroscopy system	P.O.R
RM-250, RM-500 & RM-900	Other Raman System	P.O.R

Sciencetech Raman System RM-9040DA

The RM-9040DA is a complete modular system, specially designed for educational and research purposes. The 9040DA allows the study of solid, liquid and gas samples with a variety of sample attachments. With its very low stray light level and high resolution, measurements very close to the Raman Line can be achieved making such determinations as the rotational modes of air molecules possible.

The Raman RM-9040DA includes:

1. Ar ion laser (optional or customer supplied), air cooled, fixed or switchable at 488 nm or 512 nm with power supply.

2. Laser focusing optics onto the sample with optimization alignment adjustments.

3. Sample chambers: Gas and liquid cells as well as a solid sample holder. The swap from the solid sample holder to the liquid holder and vice versa is very simple. The system maintains alignment when either sample chamber is reinstalled.

4. Light tight enclosure for the all compartments.

5. Filter holder with Notch filter and coupling optics to the monochromator with completely light tight enclosure. All components are achromatic in vibration free mounts and holders.

6. 9040DA double additive half-meter spectrometer.
This instrument has been specially designed for Raman Applications and special care has been taken to eliminate stray light. This also includes a light tight enclosure as well as special baffles, gaskets, division wall between the two monochromator sections and special mounts for mirrors and gratings.

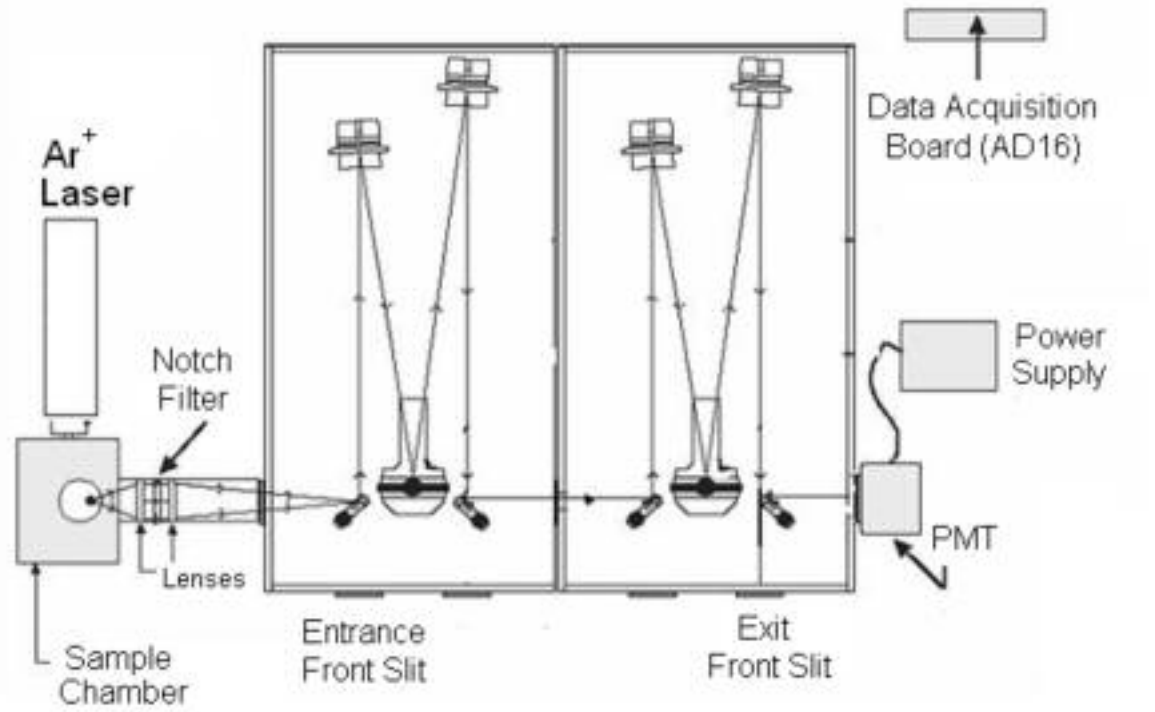
7. Photomultiplier detector system with high sensitive PMT tube. The Sciencetech PMH-02 room temperature housing is standard, or the optional PMH-04 thermoelectric cooled housing is available.

8. Data acquisition board with 16 bits A/D, programmable gain.

9. SciSpec software package for Windows.

10. Optical base for the sample chamber, laser and the monochromator.

Layout of Raman System with Coupling Optics



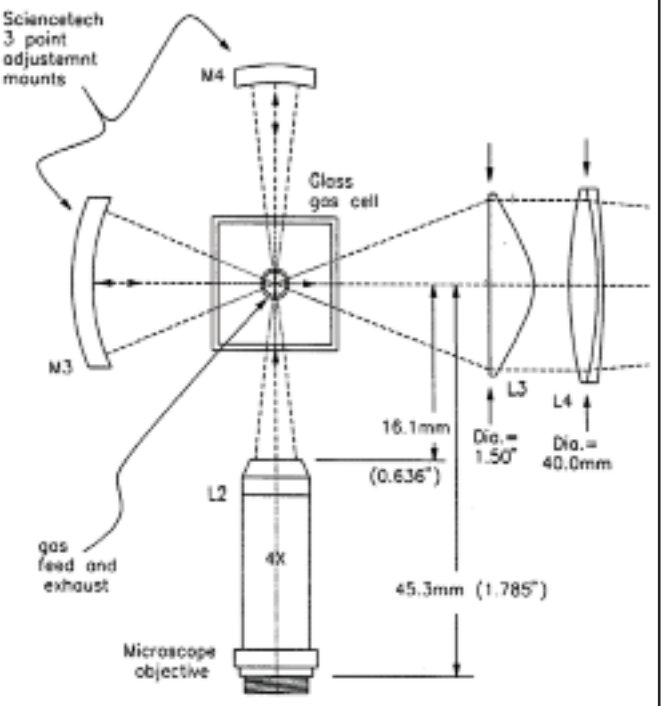
The 9040DA includes:

- Input, intermediate and output adjustable slits up to 30 mm in height. All slits are micrometer activated with easy access to adjust width and height.
- Holographic gratings, mounted in kinematic mounts for easy replacement.
- Stepper motor with a microprocessor controller.

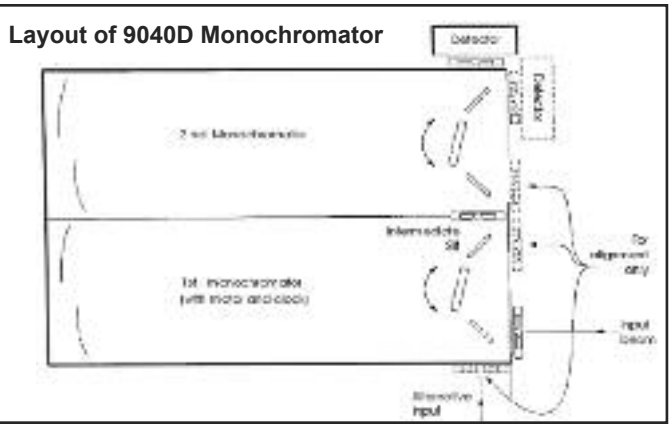
- User selectable scanning, done linearly in energy (cm^{-1}, eV, etc.) or wavelengths (nm, mm, A).

The 9040DA can also be fitted with one of Sciencetech's photodiode array detectors or cooled CCDs.

Gas Sample Chamber- Top View



Layout of 9040D Monochromator



Technical Specifications

9040DA DOUBLE ADDITIVE MONOCHROMATOR

All specifications are for a 1800 1/mm holographic grating and argon laser at 488 nm except when stated otherwise.

- **Drive:** Manual and computer controlled sine drive
- **Gratings:** Holographic, 1800 l/mm (for std Raman apps)
- **Focal Length:** **Input:** 500mm
  Output: 550 mm
  (both input and output are the same in each section of 9040DA, other flat gratings available)
- **Input Aperture:**
  Standard: f/6.9 (square 64 mm gratings)
  Fast: f/5.2 or better (square 84 mm gratings)
- **Dispersion:** 0.76 nm/mm w/ 1200 l/mm grating
  0.51 nm/mm w/ 1800 l/mm grating
- **Optical Resolution:**
  Limit: Better than 0.02 nm (for f/6.9 operation)
  Bandpass: 0.05 nm (2 cm-1) (with 100 mm slits)
- **Slits:**
  Standard: Straight, bilaterally adjustable
  Height: 0 to 25 mm with step adjustment
  Width: 10 µm to 3 mm
- **Wavelength Range:** 185 nm to 900 nm
- **Scanning Resolution:** 0.005 nm in microstep mode
- **Wavelength Accuracy:** ± 0.05 nm
- **Wavelength Reproducibility:** ±0.025 nm
- **Motor Scanning Range:**
  180 -1500 nm w/ 1200 l/mm grating
  180-1000 nm w/ 1800 l/mm grating
- **Flat Fill:** 30 mm x 12 mm
- **Dimensions:** 9” x 30.4” x 30”
  (22.6 cm x 76 cm x 74 cm)
- **Weight:** 85 kg

OTHER SINGLE CHANNEL SPECTROMETER SYSTEMS FOR RAMAN

RM-250 system consists of:

A. Sample chamber
B. Double additive monochromator
C. Photomultiplier detector

The double monochromator 9055DA in this system works in additive mode. Dispersed light exiting the first monochromator is dispersed again with both dispersions in the same direction. The 9055DA is a double 1/4 meter monochromator with resolution optimized for 500-700nm, corresponding to the wavelengths of most of the lasers used as Raman sources. It uses holographic gratings to minimize stray light.

RM-900 system consists of:

A. Sample chamber with coupling optics, X-Y stage for alignment control.
B. 1 meter double additive monochromator (Sciencetech 9490DA).
C. Photomultiplier detector system.
D. All electronics for motor control and data acquisition with optional computer.

The 9490DA is an optimized Czerny Turner with a focal length of 914mm. It features manual and automatic grating control, kinematic holographic gratings for low stray light, scanning in nm or cm^{-1}, multiple entrance and exit ports, and microprocessor controller with microstep. Please refer to page 3-22 for more information.

Multichannel Systems:

Multichannel Raman spectroscopy offers many advantages for the user: it allows the recording of a large portion of the spectrum at once. Routine acquisition can be reduced from minutes and even hours to a few seconds. As a consequence of this fact other advantages arise:

- Decrease in noise, due to decrease in light fluctuations during the much shorter acquisition time.
- Increase in sensitivity due to the possibility of longer integration times.
- Decrease in background variations and sample deterioration.

RM-500 system consists of:

A. Sample chamber with coupling for laser and filter monochromator, X-stage for alignment control
B. Double monochromator (1/4 meter) 9055D in subtractive mode.
C. Sciencetech 9040 dispersive high resolution monochromator.
D. Dual detector system (optional).
i. Photon counting photomultiplier (PMT);
ii. 1024 element Photodiode array detector (PDA) or CCD.
E. All electronics for motor control and data acquisition.
F. Software for control of gratings, data acquisition and display.
G. Optional computer.

In this system, a double monochromator first separates a selected wavelength segment out of the incoming radiation. The segment is then passed onto a spectrograph stage where is dispersed over the multichannel detector sensitive area. Optional dual detector operation with flipping mirror allows the selection of the additional port in spectrograph for photomultiplier detection.

Camera features

Photodiode array detector system. 1024 elements, 25µm each. Detection range 200-1050nm. Specifications with 9040 monochromator:

Spectral coverage: 26 nm, 980 cm^{-1}(@1800 l/mm, 514 nm)
(1024 elements) 78 nm,
2940 cm^{-1} (@600 l/mm, 514 nm)

Camera resolution: 0.026nm, 1cm^{-1}(@1800 l/mm, 514 nm)
(25µm elements) 0.077 nm,
3 cm^{-1} (@600 l/mm, 514 nm)