SPECTROLINE®

Ultraviolet Products for Life Science

- ◆ **Transilluminators**
- ◆ **UV Crosslinkers**
- ◆ **Imaging Systems**
- ◆ **Photo Documentation Workstations**
- ◆ **UV Lamps**
- ◆ **Digital Radiometers**
- ◆ **UV Protective Eye and Face Wear**

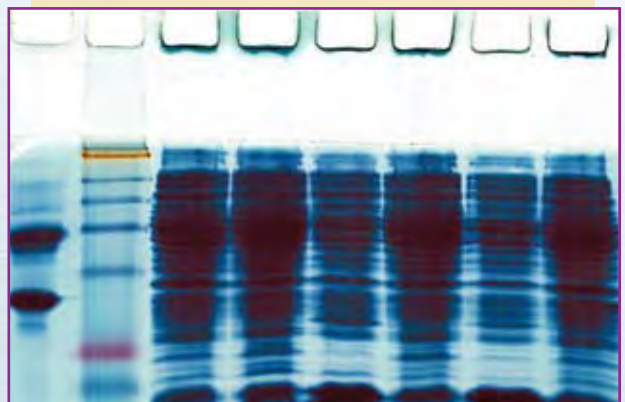*ISO 9001:2000* **CERTIFIED COMPANY**

SPECTRONICS CORPORATION

About Spectronics Corporation

Spectronics Corporation is the world's leading manufacturer of high-quality ultraviolet products for the life science and laboratory fields. For today's researcher, Spectronics offers a wide range of products that includes UV lamps, transilluminators, crosslinkers, imaging systems, viewing cabinets and photo-documentation workstations.

These state-of-the-art products are built to exacting standards and are used for applications that demand uncompromising quality and reliability. Most of our models are UL listed, CSA approved and CE approved.

Spectronics' modern, 100,000 square foot manufacturing facility and office headquarters is located in Westbury, New York. Nearly 200 personnel are involved in all phases of research and development, manufacturing, sales, marketing, customer service, and logistical and technical support.

More than five decades after its inception, the goal of Spectronics is still the same: to produce effective, top-quality products with the utmost dedication to customer satisfaction.

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Transilluminators

Background

Used for the visualization of molecular samples, transilluminators have become indispensable tools in today's life science laboratories. They are also ideal for use in forensic science, fluorescence detection and much more. Given their valuable role, it is important for researchers to consider factors such as proper wavelength, light intensity (wattage) and uniformity, as well as convenience when choosing the right UV or visible transilluminator for optimum results and value, based on their typical applications.

When it comes to UV emission, great concerns are often paid to the unit's fluorescent response and protection against UV-induced DNA damage. Spectroline® UV transilluminators — offering the world's largest selection – address these important issues and concerns.

Application

The wavelength requirement for a unit will depend on the type of fluorophore molecule and the amount of nucleic acid present in the gel. For some of the newer fluorescent dyes such as SYBR®, SYPRO® and GelStar® series, use of wavelengths longer than UV (blue and longer visible spectrums) are better suited for viewing and documentation.

For more common UV applications, ethidium bromide gels are well illuminated with medium wavelength (312nm or MW) transilluminators. While units with shorter wavelength (254nm or SW) may be used for better signal to background contrast, it must be noted that with long-term exposure, they may cause photonicking, photodimerization and photobleaching. When working with a small amount of nucleic acid material, longer wavelength models (365nm or LW) are better suited for extended sampling by minimizing these UV-induced damages.

High power (15-watt) units offering increased UV intensities are best suited when working with a small amount of nucleic acid, since they enhance illumination of faint bands. These units provide the high UV irradiance needed to excite fluorophore molecules in electrophoresis gels and thin layer chromatograms. Although there are even higher-powered models on the market (25-watt), the excessive UV intensity emitted will increase the unnecessary risk of sample photobleaching, not to mention higher unit cost.

Standard (8-watt) units are ideal for quick viewing of normal amounts of DNA (typical enzyme restriction digest). Models with variable-intensity controls offer intensity adjustments for viewing and image acquisition according to the amount of material present as well as the fluorophores used.

Ultraviolet

Known for their exceptional performance and durability, Spectroline® transilluminators are designed to deliver optimal UV intensity and extremely uniform UV emission to guarantee clear and reproducible results.

Spectroline transilluminators provide maximum fluorescent response for nanogram sensitivity with minimal UV damage to samples with a variety of choices in wavelength, wattage, filter size and variable intensity controls. Each unit offers high intensity, uniform UV emission and cool operation. They feature a wide variety of UV filter glass sizes to accommodate different sizes of gels and blots, as well as rugged construction and simple operation.

When working with UV models, attention should be given to the age of the UV tubes, as this will affect the sample fluorescent signals. As the UV tubes age in any transilluminator, their output steadily declines making faint bands more difficult to see. This can result in lack of positive results and incorrect densitometric measurements. Regular replacement of UV tubes is suggested, particularly for transilluminators that are shared or heavily used.

Features

Diffusing Screen: All 312nm and 365nm models come with a unique, removable, polymer-based diffusing screen that ensures uniform UV emission and excellent irradiance uniformity at the sample surface. It also improves the quality of photographic images.
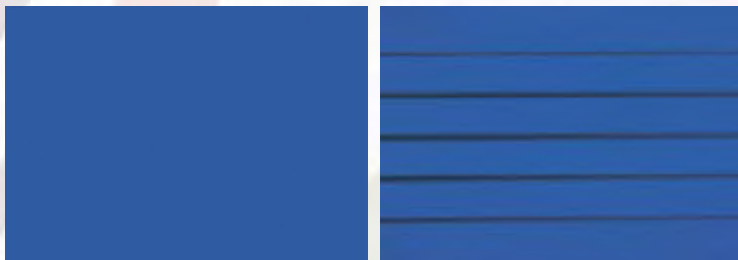
Photos taken with (left) and without (right) Spectroline diffusing screen

LONGLIFE™ Filter Glass: Found on all 254nm and certain 312nm models (2F-assembly series), this special filter glass inhibits solarization up to 50 times longer than traditional UV filters.
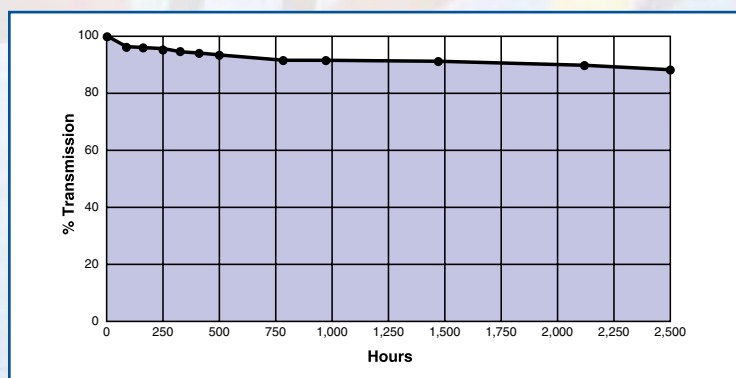
Life test of LONGLIFE filter using medium wave UV screen exposure at 11,000 µW/cm² intensity level

Features

- **LONGLIFE™ UV filter glass** — inhibits solarization up to 50 times longer than traditional UV filters

- **Easy-to-clean, rugged housing** — composed of durable, stainless-steel filter frame welded to scratch-resistant painted metal

- **Powerful cooling fan** — maintains low filter glass temperature to eliminate surface heat buildup

- **Minimal UV damage** — 312nm and 365nm models virtually eliminate transmission of 254nm radiation

- **Special diffusing screen (D)** — ensures superior surface uniformity by eliminating striations caused by the contours of the tubes; provided on all 312nm and 365nm models

- **Variable-intensity control (V)** — provides continuous intensity adjustments from 100% down to 20% for maximum sample preparation time and sensitivity

- **On/off switch (S)** — controls power to the unit

- **Automatic shut-off timer (T)** — prevents UV overexposure; doubles as on/off switch

- **Hinged UV-blocking cover (C)** — adjustable to a comfortable angle providing the end user with a clear view of surface access for sample manipulation. Eliminates the need for additional UV-absorbing clothing or face wear and protects the filter surface from accidental damage

Transilluminators
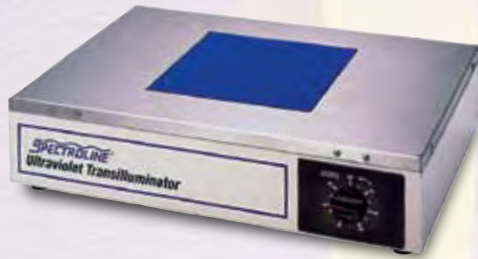
Standard Series, Single Wavelength UV

- 15-watt units provide high UV intensity
- Fixed-intensity models include TS-, TC-, TR- and TL-series
- Variable-intensity models with UV-blocking cover include TV-series
- Models accommodate a variety of sample sizes
- Housing dimensions (W x L x H): 18.5" x 19.25" x 4", 34.3 x 48.9 x 10.2cm
- Available in 120V/60Hz, 230V/50Hz, 240V/50Hz and 100V/50-60Hz

Fixed-Intensity TS-, TC-, TR- and TL-Series

Model	Wavelength	Filter Size	Filter Assembly	Tubes	Features
TS-254R	254nm	6" x 6", 15 x 15cm	2F606B	(6) 15W SW, BLE-1T155	S
TS-312R	312nm	6" x 6", 15 x 15cm	3F606R	(6) 15W MW, BLE-1T158	S, D
TS-365R	365nm	6" x 6", 15 x 15cm	2F326B	(6) 15W LW, BLE-1T151	S, D
TC-254R	254nm	8" x 8", 20 x 20cm	2F808B	(6) 15W SW, BLE-1T155	T
TC-312R	312nm	8" x 8", 20 x 20cm	3F808R	(6) 15W MW, BLE-1T158	T, D
TC-365R	365nm	8" x 8", 20 x 20cm	2F883B	(6) 15W LW, BLE-1T151	T, D
TR-254R	254nm	6" x 14", 15 x 35cm	2F614B	(6) 15W SW, BLE-1T155	S
TR-312R	312nm	6" x 14", 15 x 35cm	2F614B	(6) 15W MW, BLE-1T158	S, D
TR-365R	365nm	9" x 13", 23 x 33cm	2F365B	(6) 15W LW, BLE-1T151	S, D
TL-254R	254nm	8" x 16", 20 x 40cm	2F816B	(6) 15W SW, BLE-1T155	T
TL-312R	312nm	8" x 16", 20 x 40cm	2F816B	(6) 15W MW, BLE-1T158	T, D
TL-365R	365nm	8" x 16", 20 x 40cm	2F168B	(6) 15W LW, BLE-1T151	T, D

Variable-Intensity TV-Series

Model	Wavelength	Filter Size	Filter Assembly	Tubes	Features
TVC-312R	312nm	8" x 8", 20 x 20cm	3F808R	(6) 15W MW, BLE-1T158	S, D, C, V
TVR-312R	312nm	6" x 14", 15 x 35cm	2F614B	(6) 15W MW, BLE-1T158	S, D, C, V
TVL-312R	312nm	8" x 16", 20 x 40cm	2F816B	(6) 15W MW, BLE-1T158	S, D, C, V

Slimline™ Series, Single Wavelength UV

- Small footprint 8-watt units provide standard UV intensity
- Fixed-intensity models include TE-series in various wavelengths
- Ideal for mini gels
- Housing dimensions (W x L x H): 11.5" x 14" x 2.5", 29.2 x 35.6 x 5.7cm
- Available in 120V/60Hz, 230V/50Hz, 240V/50Hz and 100V/50-60Hz

This popular, space-saving model delivers superior performance comparable to our standard models. The unit's small footprint requires minimal bench space. It features a filter glass that measures 4.3" x 5.5" (11 x 14 cm), ideal for working with mini gels.

Model	Wavelength	Filter Size	Filter Assembly	Tubes	Features
TE-254S	254nm	4" x 5", 11 x 14cm	2F405	(4) 8W SW, BLE-8T254	S, C
TE-312S	312nm	4" x 5", 11 x 14cm	3F405S	(4) 8W MW, BLE-8T312	S, D, C
TE-365S	365nm	4" x 5", 11 x 14cm	2F685	(4) 8W LW, BLE-8T365	S, D, C

Select™ Series, Single/Dual-Wavelength UV

- Economical 8-watt units provide standard UV intensity
- Fixed-intensity 312nm models accommodate a variety of sample sizes
- Dual-wavelength models include TD-series
- Housing dimensions (W x L x H): 12" x 13.25" x 3.5", 30.5 x 33.7 x 8.9cm
- Available in 120V/60Hz, 230V/50Hz, 240V/50Hz and 100V/50-60Hz

Select series transilluminators offer all the features and benefits of our standard fixed-intensity series but designed with a cost-effective housing. Dual wavelengths, in combinations of 365/312nm, 312/254nm and 365/254nm provide broader UV applications. Single and dual-wavelength models accommodate a variety of sample gel or blot sizes, with rugged construction and simple operation. All Select series units feature hinged UV-blocking cover to protect the user from radiation and UV filter glass to inhibit solarization.

Single Wavelength

Model	Wavelength	Filter Size	Filter Assembly	Tubes	Features
TS-312E	312nm	6" x 6", 15 x 15cm	3F606E	(6) 8W MW, BLE-8T312	S, D, C
TC-312E	312nm	8" x 8", 20 x 20cm	3F808E	(6) 8W MW, BLE-8T312	S, D, C
TI-312E	312nm	8" x 10", 21 x 26cm	3F810E	(6) 8W MW, BLE-8T312	S, D, C

Dual-Wavelength TD-Series

Model	Wavelengths	Filter Size	Filter Assembly	Tubes	Features
TD-2000E	365/312nm	8" x 8", 20 x 20cm	3F808F	(5) 8W LW, BLE-8T365 (5) 8W MW, BLE-8T312	S, D, C
TD-2010E	312/254nm	8" x 8", 20 x 20cm	2F808E	(5) 8W MW, BLE-8T312 (5) 8W SW, BLE-8T254	S, D, C
TD-2020E	365/254nm	8" x 8", 20 x 20cm	2F808E	(5) 8W LW, BLE-8T365 (5) 8W SW, BLE-8T254	S, D, C
TD-2100E	365/312nm	8" x 10", 21 x 26cm	3F810E	(5) 8W LW, BLE-8T365 (5) 8W MW, BLE-8T312	S, D, C
TD-2110E	312/254nm	8" x 10", 21 x 26cm	2F810E	(5) 8W MW, BLE-8T312 (5) 8W SW, BLE-8T254	S, D, C
TD-2120E	365/254nm	8" x 10", 21 x 26cm	2F810E	(5) 8W LW, BLE-8T365	S, D, C

UV/Visible Combination Transilluminators
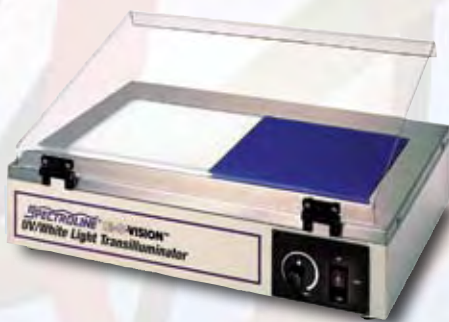
Bi-O-Vision™ Series, UV/White Light

- 8-watt units provide standard UV intensity
- Side-by-side UV/white filter sections
- Available in fixed and variable intensity models
- Housing dimensions (W x L x H): 18.5" x 19.25" x 4", 34.3 x 48.9 x 10.2cm
- Available in 120V/60Hz, 230V/50Hz, 240V/50Hz and 100V/50-60Hz

Bi-O-Vision UV/white light transilluminators offer both medium wave UV (312nm) and white light for dual-light convenience in one box. Each side of the sample platform fits samples up to 8" x 8" (20.3 x 20.3 cm). For added safety, only UV or white light can be selected with single UV/Off/VIS toggle switch.

The TD-1000R model offers fixed-intensity while the TVD-1000R offers variable-intensity control of either UV or white light. These units are continuously adjustable from 100% down to 50%.

Model	Wavelengths	Filter Size	Filter Assembly	Tubes	Features
TD-1000R	312nm/white	8" x 8", 20 x 20cm	3F959R	(5) 8W MW, BLE-8T312 (3) 8W White, BLE-1T230	S, D, C
TVD-1000R	312nm/white	8" x 8", 20 x 20cm	3F959R	(5) 8W MW, BLE-8T312 (3) 8W White, BLE-1T230	S, D, C, V

Transilluminators

Accessories for UV Transilluminators
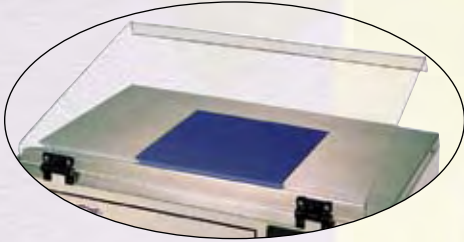
Hinged UV-Blocking Cover

• Fits over gels, blots and TLC plates
• Protects users from UV exposure
• Extremely durable

Transparent hinged cover shields the user from hazardous UV radiation and protects the filter from damage caused by dropping objects on the glass. Cover fits over all gels and TLC plates and can be easily attached to hinges on either side of the unit. Constructed of heavy-duty, acrylic-based, UV-blocking material.
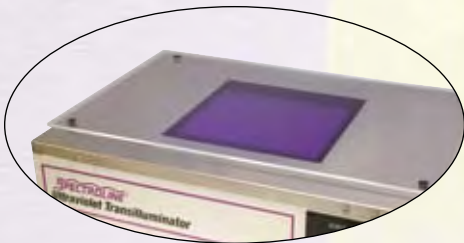
UV-Transmitting Filter Protector

• Allows manipulation of gels
• Prevents damage to the filter
• Resistant to solarization

Manipulate gels directly on the transilluminator! UV-transmitting filter protector shields the costly filter glass from cuts, scratches, breakage, etc. Transparent thermoplastic protectors are super-resistant to solarization and last longer than traditional UV protectors. Each protector covers the transilluminator platform completely. Attached rubber bumpers keep protector in place and minimizes heat build-up at transilluminator surface

Model	Size (W x L x H)	Fits
UVC-100A Cover	10.75" x 12.0" x 1.0", 27.3 x 30.5 x 2.5cm	Slimline and Select Series
UVC-250A Cover	18.0" x 13.0" x 1.0", 45.7 x 33.0 x 2.5cm	TC-, TD-, TL-, TR-, TS- and TV-series
UVT-75A Filter Protector	13.75" x 10.0", 0.4", 34.9 x 25.4 x 1.0cm	Slimline and Select Series
UVT-150A Filter Protector	19.2" x 12.2". 0.4", 48.8 x 31 x 1.0cm	TC-, TD-, TL-, TR-, TS- and TV-series
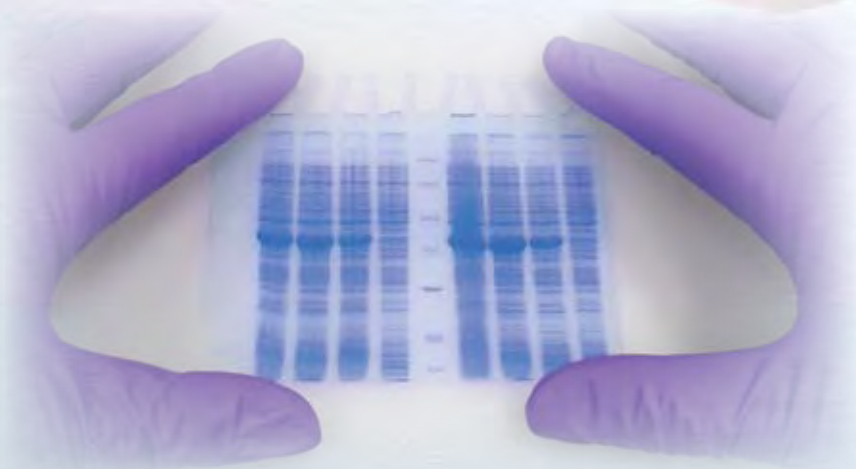
Background

One of the persistent problems facing researchers working with nucleic acids is that the genetic materials can be damaged by the very processes used to study them. For example, to achieve high sensitivity with low background signals during nucleic acid hybridization or re-probing; high concentrations of salts such as sodium dodecyl sulfate (SDS) or detergents are added to the hybridization buffers and washes. This often leads to loss of nucleic acid from blotted hybridization membranes resulting in lowered or no positive signals.

Strengthening the bonds of the genetic material to the membrane offers the ideal solution to this problem. Covalent binding can be achieved by UV crosslinking or by prolonged vacuum baking of the membranes, which often causes heat damage to the samples. The crosslinking process utilizes short wave (254nm) UV light to covalently bond nucleic acids to either nitrocellulose or nylon membranes — a process whereby thymine dimers are formed between the nucleic acids and the membrane. UV crosslinking is a quick, easy and effective procedure to avoid the loss of nucleic acids during the hybridization process leading to increased sensitivity and enhanced signals.

The **Spectrolinker™** was developed to be one of the most advanced, versatile and accurate UV crosslinkers. With the success of Spectrolinker came the **Select™** series UV crosslinkers, created specifically for the needs of researchers with limited budget. Designed to monitor UV radiation and self-adjust to variations in UV intensity, all Spectroline UV crosslinkers feature a "smart" microprocessor controller and unique true UV monitoring circuitry to enable users to get error-free results with speed, accuracy and safety. These units are built specifically to eliminate time-consuming adjustments, unnecessary repetitive programming and unwarranted risk of sample damage.

Product Lines

Spectrolinker™ Series

• Rugged, anodized aluminum housing

• Long lasting anodized aluminum chamber prevents rusting

• Available in SW, MW and LW wavelengths

• Interior chambers available in two sizes

Select™ Series

• Cost-effective, painted metal housing

• Long-lasting anodized aluminum chamber prevents rusting

• Available in SW, MW and LW wavelengths

Features

• Covalently binds nucleic acid sequences and hybridization membranes in 30 seconds or less

• Safeguards your valuable test results from washouts

• Ensures optimum nucleic acid membrane binding, even when UV output varies

• Provides ultimate ease of use and accuracy with "Smart" microprocessor controller

• Protects users from UV exposure with fully enclosed chamber

UV Crosslinkers

Applications

UV crosslinking of DNA and RNA after Northern, Southern, slot or dot blots and colony or plaque lifts. PCR decontamination. Nicking ethidium bromide-stained DNA in agarose gels. Gene mapping for cleavage-inhibiting thymine dimers. RecA mutation screening in E.coli. UV sterilization. Continuous UV dosing. Miscellaneous UV-dosage applications including UV-induced polymerization or drying

Spectrolinker™ Series

Select™ Series

The 254nm versions of the Spectrolinker and Select series UV crosslinkers provide super-fast DNA and RNA crosslinking to membranes for improved hybridization-signal sensitivity. At peak, these units can process samples in *under 30 seconds* — that's *240 times faster* than vacuum-oven baking! Our exclusive, wavelength-specific, multi-stack UV photo sensor, which is factory-calibrated to NIST standards, provides precise UV-only dosage measurements. Full range display resolution is accurate to $5\mu W/cm^2$ EMI/RFI protection. All models from both series offer exceptional accuracy and precision irradiation, even compensating for aging UV tubes when output diminishes over time.

Programmable "Smart" Microprocessor Controller

- LED-function indicators and color-coded keypad
- Built-in "help" messages
- Four operation modes
- Auto Repeat function remembers last operation without reprogramming

Four operation modes —

- Optimal Crosslink mode automatically provides a preset UV energy dosage of 120 mJ/cm^2
- Energy-set mode (0-999,990 $\mu J/cm^2$) allows for variable amounts of UV energy to be programmed
- Time mode (0-9,900 seconds), allows for variable time settings to be established
- Intensity mode shows steady-state UV intensity output

Note: All units have an irradiance display resolution of $\pm5\mu W/cm^2$ over the entire range.

Built-in "help" messages —

- Bulb: When the UV tubes need to be replaced
- Door open: the unit also protects users from accidental UV radiation when the door is opened during a run
- End: End of cycle confirmed with display and audible beep
- Remaining Time/Energy provides operation status report
- When the operation has been interrupted. The RESET button cancels the latest settings and START button automatically resumes the current operation.

Standard Size

Spectrolinker™ XL-1000 Series and Select™ XLE-Series

- Overall housing dimensions (W x H x D): 19.5" x 10.5" x 9", 49.5 x 26.7 x 22.9cm
- Effective inner chamber dimensions (W x H x D): 13.5" x 7.0" x 7.5", 34.3 x 17.8 x 19.1cm
- Door dimensions (W x H): 12.0" x 6.25", 30.5 x 15.9cm
- Viewing window dimensions (W x H): 6.0" x 2.5", 15.2 x 6.4cm for XL-series, 6.0" x 3.0", 15.2 x 7.6cm for XLE-series
- Net weight: 17.5 lb, 7.9kg
- Power: 120V-60Hz-2A, 230V-50Hz-2A, 100V-50/60Hz-2A

Model	Wavelength	Tubes
XL-1000, XLE-1000	254nm	(5) 8W SW, BLE-8T254
XL-1000A, XLE-1000A	365nm	(5) 8W LW, BLE-8T365
XL-1000B, XLE-1000B	312nm	(5) 8W MW, BLE-8T312

Large Size

Spectrolinker™ XL-1500 Series

- Overall housing dimensions (W x H x D): 24.0" x 10.5" x 14", 61.0 x 26.7 x 35.6cm
- Effective inner chamber dimensions (W x H x D): 18.25" x 6.25" x 12.5", 46.4 x 15.9 x 31.8cm
- Door dimensions (W x H): 16.0" x 6.25", 40.6 x 15.9cm
- Viewing window dimensions (W x H): 6.0" x 2.5", 15.2 x 6.4cm
- Net weight: 26 lb, 11.8kg
- Power: 120V-60Hz-3A, 230V-50Hz-3A, 100V-50/60Hz-3A

Model	Wavelength	Tubes
XL-1500	254nm	(6) 15W SW, BLE-1T155
XL-1500A	365nm	(6) 15W LW, BLE-1T151
XL-1500B	312nm	(6) 15W MW, BLE-1T158

GeneLine™ Imaging Systems

Background

GeneLine™ imaging systems allow the end user to acquire, view, transfer, archive and analyze gel images — all in real time and in a *digitized* PC format. Choose complete, fully automated systems, **ImageEZE™** and **DigiCAM™** series, or combine separate components for your individual application needs.

Our GeneLine products combine cameras and image acquisition software to provide consistently high quality gel images. The acquisition software acquires images, provides further manipulation and saves the images, all with computer-control for ultimate ease. At the touch of a button, the **ImageAide™** analysis software receives digitized image directly by activating one button, or can alternatively import any picture-formatted document (BMP, JPG AND TIF extensions). The software performs a complete autoanalysis and quantification of the images — including band matching — *instantly!*

Product Lines

ImageEZE™
- Advanced CCD camera with enhanced pixel resolution
- Compact darkroom hood
- Computer interface card
- ImageSource™ acquisition software
- ImageAide™ analysis software
- With or without transilluminator

DigiCAM™
- Digital color camera with auto zoom
- Compact darkroom hood
- Compatible with user-supplied PC desktop or laptop and stand-alone transilluminators
- Digital camera software offers direct link to ImageAide analysis software with TWAIN acquisition feature

Components
- Digital or CCD camera kits with applicable lenses and filters
- Darkroom hood or cabinets for transillumination or epi-illumination needs
- ImageSource acquisition kit with PCI card, software and camera cables
- ImageAide analysis kit with band matching software and security key

Component Style

ImageEZE™ Series
- Features laboratory grade 8-bit CCD camera
- Components provide easy connection to user-supplied PC
- Ultimate simplicity in image acquisition, analysis and reporting
- One button transfer of acquired image to analysis software
- Gels, blots and colony images are easily acquired and analyzed
- Complete package available with UV transilluminator

ImageEZE is a complete image acquisition and analysis gel documentation system. Components include a CCD camera with enhanced pixel resolution mounted onto a darkroom hood, a computer interface PCI card, **ImageSource™** image acquisition software and **ImageAide™** analysis software. **ImageSource** software provides for control of real time images with automatic exposure control then transfers image data to **ImageAide** for sophisticated icon-driven analyses of all types of images.

GL-3001   **GL-3051**

ImageEZE Specifications

Camera, lens, filter assembly	8-bit CCD with on-chip integration, 8-48mm zoom, +2 diopter lens and standard UV/IR filter
Images	768 x 494 pixels
Camera hood with CCD camera bracket	fits over 21 x 26cm (8" x 10") samples
Acquisition software	ImageSource for automated image capture
Analysis software, band matching	ImageAide for gels, colonies, spots, blots, manual band quantification

Model	Product	Camera Kit/Hood	Acquisition	Analysis	Transilluminator
GL-3001	ImageEZE Band Matching System	GL-4500A/GL-1000	GL-3100	GL-3300	OPTIONAL
GL-3051	ImageEZE Band Matching Plus	GL-4500A/GL-1000	GL-3100	GL-3300	TVC-312R

DigiCAM™ Series
- High-resolution digital color camera
- Complete acquisition software compatible with user-supplied PC laptop or desktop
- Digital camera software offers direct link to ImageAide analysis software with TWAIN acquisition for ultimate GLP compliance
- Complete package available with UV transilluminator

DigiCAM is designed to provide the ultimate flexibility in acquiring, viewing, transferring, archiving and analyzing gel images — all in a completely digital format. USB camera to PC connection provides ultimate simplicity over traditional CCD camera systems by eliminating the need for installation of computer interface card (acquisition board) for image manipulation. **DigiCAM** offers direct loading (TWAIN acquisition) of saved images to **ImageAide** for further image analyses and band quantification.

GL-4001B

GL-4051B

GeneLine Imaging Systems

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GeneLine™ Imaging Systems

DigiCAM™ Specifications

Camera, lens, filter assembly	Digital camera, auto zoom, digital zoom and standard UV/IR filter
Images	7.1 megapixels or greater
Camera hood with digital camera bracket	Fits over 21 x 26cm (8" x 10") samples
Interface	USB, A/V output (NTSC or PAL)
Acquisition software (with digital camera)	Solution disk for automated image capturing
Analysis software, band matching	ImageAide for gels, colonies, spots, blots, manual band quantification

Model	Product	Camera Kit/Hood	Acquisition	Analysis	Transilluminator
GL-4001B	DigiCAM Band Matching System	GL-4200B/GL-1001	Solution Disk	GL-3300	OPTIONAL
GL-4051B	DigiCAM Band Matching Plus	GL-4200B/GL-1001	Solution Disk	GL-3300	TVC-312R

Epi-DigiCAM™ Series

- Features DigiCAM System with additional dual UV/white light epi-illumination sources
- Includes fluorescence analysis cabinet with white light, outfitted with UV lamp (312nm/254nm) for epi-illumination
- Add Spectroline UV/white light transilluminator for trans-illumination
- Complete package available with UV transilluminator

For those requiring sample illumination from above and below, our cost-effective **Epi-DigiCAM™** is a digital acquisition and analysis system in a single darkroom cabinet-style. For epi-illumination of samples, the CC-80 fluorescence analysis cabinet (see Fluorescence Analysis Workstations section for details) is equipped with EBF-280C, our most versatile 8-watt, short and medium wavelength UV lamp (see section on Hand-Held UV Lamps for details). For brighter fluorescent response, CC-80 can accommodate additional Spectroline E-series UV lamps varying in UV short, medium and long wavelength combinations. For UV/white light transillumination, add an optional Bi-O-Vision transilluminator (see section on Transilluminators for details).

Epi-DigiCAM Specifications

Camera, lens, filter assembly	Digital camera, auto zoom, digital zoom and standard UV/IR filter
Images	7.1 megapixels or greater
Camera hood with digital camera bracket	CC-80 analysis cabinet with GL-1101 camera adapter
UV Epi-illumination	EBF-280C, 8-watt MW/SW lamp
Interface	USB, A/V output (NTSC or PAL)
Acquisition software (with digital camera)	Solution disk for automated image capture
Analysis software, band matching	ImageAide for gels, colonies, spots, blots, manual band quantification

Model	Product	Camera Kit/Cabinet	Acquisition	Analysis	Transilluminator
GL-4101B	Epi-DigiCAM Band Matching System	GL-4200B/CC-80	Solution Disk	GL-3300	OPTIONAL
GL-4151B	Epi-DigiCAM Band Matching Plus	GL-4200B/CC-80	Solution Disk	GL-3300	TVC-312R

ImageSource™ Image Acquisition Software
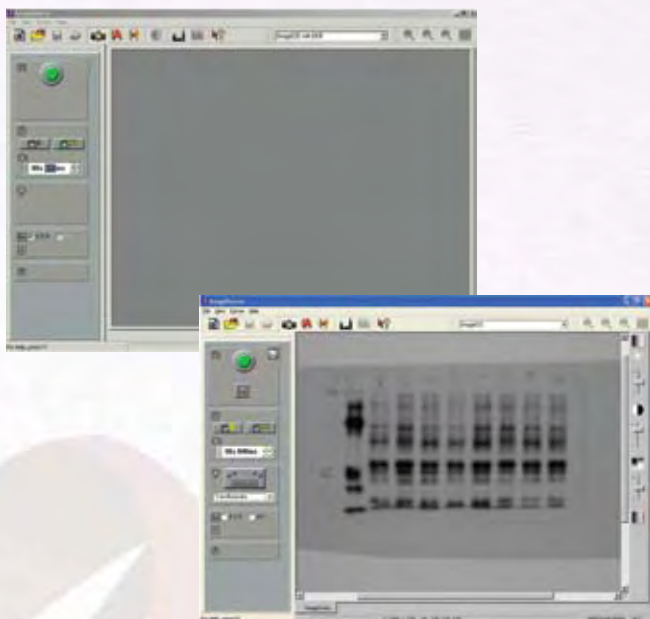
- Provides fully automated control of CCD camera functions for both focusing and acquisition
- On-screen display of system status
- Real-time, live image positioning and manipulation
- Icon-driven, single-click control of software capabilities
- Direct link to ImageAide analysis software
- Saves images in wide range of file formats

ImageSource software is perfect for acquiring, annotating and printing of laboratory images. Utilizing a simple-to-use interface, offering a wide range of icon-based functions, **ImageSource** provides the ultimate image management.

ImageSource is available as an acquisition constituent of ImageEZE system or sold separately as ImageSource Data Acquisition Kit. The kit includes the interface card (acquisition board), CCD camera cables and ImageSource software.

Software Application Window and Toolbars

Image Capture toolbox offers user-friendly configuration controls for extended dynamic range (EDR) and neutral field correction (NF). Capabilities include controls for live/freeze/snap capture, camera integration, saturation detection for quantitative applications, brightness/contrast/gamma, zooming/scrolling and 3-D view.

Annotate Image Toolbar offers cropping, drawing and placing annotations in the image. Text, lines, arrows and shapes can be added in different colors and sizes.

Enhance Image Toolbar offers defining and cropping of image regions, boundary sharpening and smoothing, image speckle correction and inversion. Additionally, images can be flipped horizontally or vertically as desired.

Additional Software Features

- User defined system configurations for creating and saving default image settings.
- Complete Help section located in Standard Toolbar is accessible anytime during use of ImageSource.
- File menu for acquiring, importing and manipulating previously saved images.
- Includes full windows-based document functions such as cut, copy, paste and undo.
- Report and printing settings are also accessible.
- Single-click icon to send image directly to ImageAide for analysis.

*(Periodic version-specific updates are provided FREE OF CHARGE to original purchasers of **ImageSource** software)*

GeneLine™ Imaging Systems

ImageAide™ Image Analysis Software
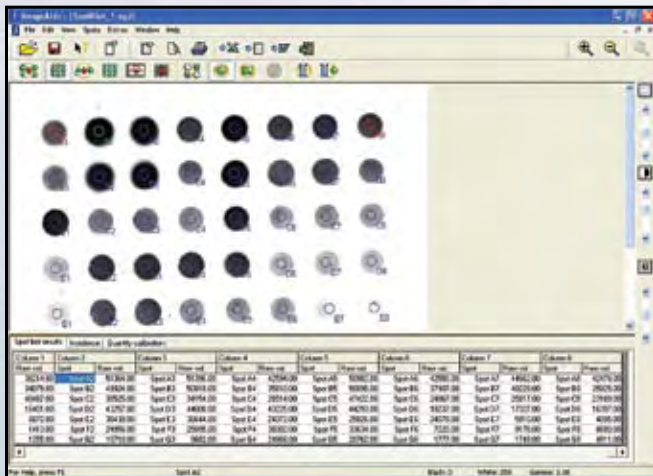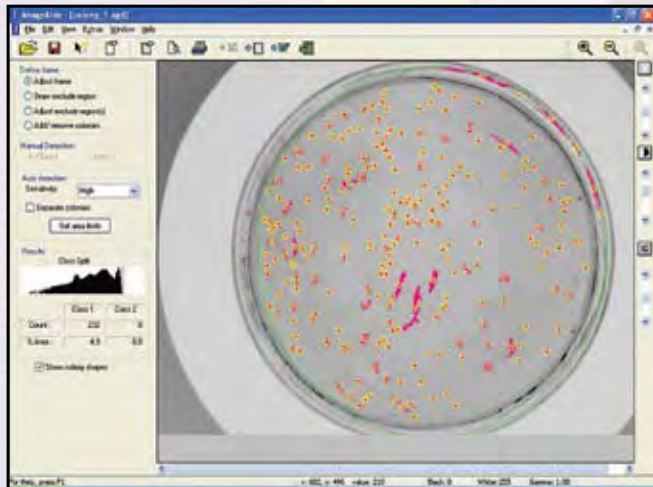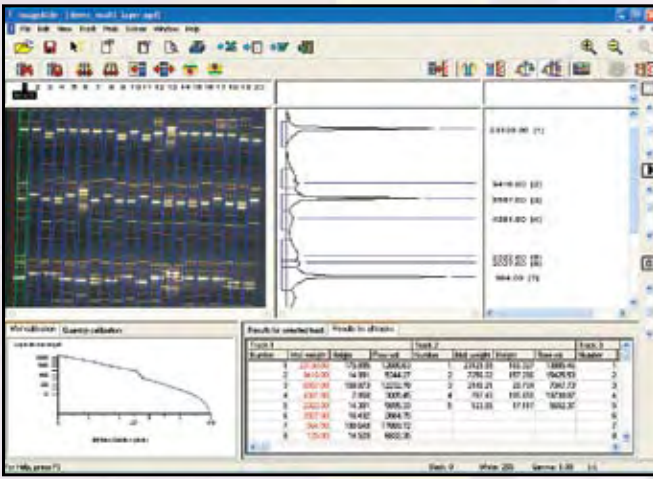
- Icon-based software for ultimate simplicity providing complete and accurate image analysis instantly

- User-control image brightness, contrast and gamma settings

- Manual and automated track, band, peak, lane and edge finding even on indistinct and smiling bands

- Automatic baseline correction and band manipulation

- Band matching capabilities

- Track labeling and profile comparison with corresponding histogram peaks

- Integral MW libraries and display of calibration curves

- Linear and quadratic calibration selection

- Manual and automated spot location, sizing and positioning with grid or non-grid formats

- Manual and automated background correction with compensation for grid variances

- Manual and automated colony counting with light and dark configurations

- Setting of min and max colony area sizing, shape and position with ability to define areas of exclusion

- Manual band quantification provides user to quantify unknown bands and spots using positive and negative controls

- User-configurable gel, spot and colony results: position, RF, peaks, area, raw quantification units (ng, pg, or %)

- GLP compliant software, including reporting

- Direct exporting of raw data and graph results to user provided Excel and Word

ImageAide is a software package used for analyzing and quantifying 1-D gel gels (multi-tier, protein, GFP, PCR, visible, autorad) and 2-D colony, spot images. Secured SGD default images from CCD and digital cameras are imported *directly* into **ImageAide** or non-secured JPG, BMP, TIF images can be imported. Simply select OK for a complete, fully automated analysis of the image instantly. **ImageAide** will automatically identify and display lanes, bands, edges then produce track profiles and results — all on *one* window!

ImageAide, a major module of all **GeneLine** imaging systems, is an analysis constituent of our component systems, which include our **ImageEZE** and **DigiCAM** series. The software is also sold separately as **ImageAide** analysis software.

*Periodic version-specific updates are provided FREE OF CHARGE to original purchasers of **ImageAide** software*

Features
Detailed Parameters
To promote multi-user control, researchers can create and save their own preferred parameters, making subsequent analyses even faster each time they log onto the software.

Fast Analysis of Gel Images
Selected image from Sample properties is imported *instantly* into the quantitative portion of **ImageAide**. Here with one gel window view, lanes, bands, edges and track profiles are automatically calculated and raw data in both table and graph formats are displayed for further review and analysis.

Track editing
Unlocking band manipulation allows individual tracks to be deleted, moved or adjusted for width and position.

Calibration
All unknown bands are compared to calibrated bands of reference track, either with standardized molecular weights or defined quantities. A library of standards for molecular weight is included with **ImageAide**. Quantity calibration can be either manually or with automatically assigned quantities.

Band Matching
Peaks on sample tracks can be matched to peaks on a standard or different track.

Cross gel track profiling
Analyzed tracks on different tracks and/or different gels saved with the **ImageAide** software can be opened, displayed and overlaid for profile comparison.

Fast Analysis of Colonies
Like gel images, colony plate images (SGD, BMP, JPG, TIF) can be imported for further analysis.

Colony counting window
This process is entirely automatic but individual colonies can be manually added or removed. The Results box shows the number of colonies counted and is updated continuously to show changes in colony counting affected by changes in detection parameters and defined regions.

Fast Analysis of Manual Band Quantification and Spot Blot Images
Like gel images, spot/band images (SGD, BMP, JPG, TIF) can be imported for further analysis. The Analysis type selection of Manual Band Quantification or Spot Blot can be made with drop-down menu.

Spot blot/manual band quantification window
When ImageAide analyzes a manual band quantification image, it takes measurements from defined areas ('boxes' drawn by end-user). For spot blot image, it takes measurements from a defined spot ('spot frame'). For image analysis, rectangular, circular or free hand shapes can be placed on bands while automatic or manual grids can be placed over the spots.

Spot/band editing
Similar to track editing, bands and spots can be automatically or manually analyzed. Manual compensation for unusual regions is accomplished with unlocking spot/band image, allowing individual regions to be deleted, moved or adjusted for size and position.

Results
Configurable results are a feature of ImageAide. For gel analysis, graphs of MW and quantity calibrations as well as dendrogram are displayed. Raw data include peak height, area, volume, band location, matching comparisons, matrix and coefficient tables. For colony counting, results include histogram of the light and dark colonies as well as raw data for both classes of colonies. For spot blot and manual band quantification, results table can be customized based on the amount of information to be viewed and compared.

### Reporting
ImageAide has a comprehensive individual reporting system to include configurable details of the sample, results, date and time. For greater options, analysis and data information can be exported to user-provided software such as Word for documentation and Excel for further detailing and charting. The software also has its own GLP reporting system for ultimate security and compliance.

GeneLine™ Imaging Systems

GeneLine Components and Accessories

Camera and Acquisition Kits
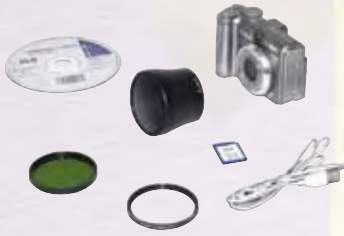
Digital Camera Kit
GL-4200B Includes high-resolution digital camera with memory card, (4) AA batteries, USB interface cable, digital camera acquisition software, digital lens adapter (GL-0150B), close-up lens (GL-0120), UV/IR filter (GL-2100) and digital camera bracket (GL-0200)

CCD Camera Kit
GL-4500A Includes 8-bit CCD camera (GL-0100) with CCD zoom lens (GL-0110), CCD lens adapter (GL-0140), close-up lens (GL-0120), UV/IR filter (GL-2100) and CCD Camera bracket (GL-0300)

ImageSource Acquisition Kit
GL-3100 Includes acquisition board, cables and software

ImageAide Analysis Software
GL-3300 Band matching analysis software

Computer Components

GL-4300 Includes thermal printer with USB and parallel interfaces and one roll of thermal paper

GL-3610 Case of five rolls of thermal paper

Replacement Parts

GL-1000 GeneLine hood (for 8" x 10", 21 x 26cm samples) without camera bracket

GL-1101 Universal camera adapter for CC-80

GL-1201 Universal camera adapter with 58mm adapter ring for CL-150

GL-0140 Lens adapter for GL-4500A CCD camera, 58mm ring

GL-1001 GeneLine universal darkroom hood with 58mm adapter ring

GL-0150B Lens adapter for GL-4200B digital camera, 58mm ring

GL-0100 Laboratory grade 8-bit CCD camera without cables

GL-1100 Snap-on camera adapter for CC-80 without camera bracket

GL-0110 Zoom lens for GL-0100, 8-48mm

GL-2100 UV/IR Filter, 58mm ring

GL-1200 Snap-on camera adapter for CL-50 without camera bracket

GL-0120 Close-up lens, +2 diopter, 58mm ring

GL-0300 CCD camera bracket

Visit our website at **www.spectroline.com** for more detailed information about these and other Spectroline products

Product Lines

CM-Series
- Lightweight, portable viewing darkroom is easily transported
- Removable bottom panel for use with Spectroline transilluminators
- Felt curtain provides easy access to cabinet interior
- Models available with or without UV light sources

CX-Series
- Large, UV viewing darkroom for use with larger samples
- Removable bottom panel for use with Spectroline transilluminators
- Available with side curtains or front door providing easy access to cabinet interior

CC-, CL-Series
- Large, UV viewing darkroom for use with larger samples
- Removable bottom panel for use with Spectroline transilluminators
- Felt curtain provides easy access to cabinet interior while blocking out external light

Features

- Provide superior fluorescence analysis and documentation
- Modular design with inter-changeable lamps for varying UV wavelengths
- Offer maximum fluorescent contrast with a wide range of UV transilluminators
- Effortless sample documentation with "snap-on" camera adapters for instant, film, CCD and digital cameras

Background

In the context of life sciences research, photo documentation enables researchers to take photographs of their electrophoretically separated nucleic acids with manual cameras, such as a 35mm or a Polaroid. These images are documented onto print or film for further scanning and densitometric analysis. Viewing cabinets (or darkroom hoods), cameras and their adapters make up the necessary parts of any photo documentation workstation.

Spectroline workstations utilize darkroom cabinets for convenient viewing, analyzing or photographing of fluorescent samples with both epi-illumination and trans-illumination light sources. Our full range of cabinets provides different working sample sizes, options for UV lamps and is useful for numerous applications.

Applications

Long Wave UV
Forensic investigation, chromatography, cellulose TLC plates, titration process, fluorochemistry, UV dosing

Medium Wave UV
Gel electrophoresis, gradient sampling, UV dosing

Short Wave UV
UV crosslinking, UV sterilization, mutation studies, silica TLC plates, toxicology, microbiology, protein, steroid and vitamin separations, UV dosing

Portable Viewing Cabinets, CM-Series

- Flexible, contoured eyepiece with a built-in UV-absorbing window for safe sample viewing
- Felt curtain permits easy access to cabinet interior while shielding samples from external light
- Removable bottom panel allows easy positioning over transilluminators
- Lightweight, aluminum construction provides transportable darkroom
- Cabinet dimensions (W x L x H): 9" x 12" x 6.5", 22.9 x 30.5 x 16.5 cm

Our portable, space-saving mini-cabinets double as personal darkrooms and UV irradiating units. The CM-10 model comes without a light source but can be outfitted with one of our Spectroline E-series UV lamps, available in 4-, 5- and 6-watt versions in combinations of LW, MW and SW. The CM-24 model is equipped with an ENF-240C lamp and CM-26 model is equipped with an ENF-260C.

Fluorescence Analysis Workstations

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Fluorescence Analysis Workstations

CM-Series

Model	Product	UV Tubes with Typical Intensities	Net Weight
CM-10	Cabinet only	optional	5.0 lbs, 2.3kg
CM-24	CM-10 with ENF-240C	4W, 365nm with 300µW/cm^2, 254nm with 310µW/cm^2	7.0 lbs, 3.2kg
CM-26	CM-10 with ENF-260C	6W, 365nm with 350µW/cm^2, 254nm with 390µW/cm^2	7.2 lbs, 3.4kg

Fluorescence Analysis Cabinets, CX-Series

CX-20

- Specially designed for 20 x 20 cm gels and TLC plates
- Units are equipped with individual long wave, medium wave and short wave UV tubes, including an internal white light bulb
- Flexible, contoured eye piece with a built-in UV-absorbing window to increase fluorescent contrast and reduce eye fatigue
- Full size CX-20 series offer 8-watt tubes with standard UV intensity
- Large CX-50 series offer 15-watt tubes with high UV intensity
- Designed to be used with most Spectroline transilluminators

CX-21

The **CX-series** UV viewing cabinets deliver standard and high UV intensities assuring maximum UV irradiance, fluorescent contrast and peak efficiency. Designed for use with our Spectroline transilluminators, a removable bottom panel allows for additional trans-illumination source. The flexible, contoured viewing eyepiece with a built-in UV-absorbing sight glass provides comfort, safety and to eliminate "blue haze" interference needed for maximum fluorescent contrast. For convenience, these workstations feature push-button wavelength selection and internal white light control. To protect samples from unwanted light exposure, all power buttons in these units are color-coded for convenience.

CX-50 Series

The CX-20 and CX-21 are equipped with internal 8-watt LW (365nm), SW (254nm) and white light tubes. While the double-tiered soft rubber curtains on both sides of CX-20 unit give the user easy access to the interior, the flip-down access door on the CX-21 unit allows direct placement of samples from the front of the unit. Both the curtains and the door provide complete shielding from external light. To protect the user from accidental UV exposure, CX-21 features an interlock mechanism that turns off UV sources when door is open. The CX-50 series cabinets, each with standard 25-watt white light bulb, are equipped with separate internal 15-watt LW (365nm), MW (312nm), and/or SW (254nm) tubes depending on the model. Each unit is made of a rugged metal housing with an adjustable 3-position sample platform and double-tiered, soft rubber curtain that shields samples from external light.

CX-20 Series

- Overall housing dimensions (W x L x H): 12" x 16" x 9", 30.5 x 40.6 x 22.9cm
- Internal white light: 25-watt bulb

CX-50 Series

- Overall housing dimensions (W X L X H): 16.25" x 24.25" x 13.25", 30.5 x 40.6 x 22.9cm
- Internal white light: 25-watt bulb

Model	Product	Internal UV Tubes	Net Weight
CX-20	Cabinet with curtains	8W, 365nm/254nm	13.0 lbs, 5.9kg
CX-21	Cabinet with metal door	8W, 365nm/254nm	13.5 lbs, 6.1kg
CX-50	Large cabinet	15W, 365nm/254nm	30.25 lbs, 13.7kg
CX-50B	Large cabinet	2 x 15W, 312nm	30.25 lbs, 13.7kg
CX-50F	Large cabinet	2 x 15W, 254nm	30.25 lbs, 13.7kg
CX-50N	Large cabinet	2 x 15W, 365nm	30.25 lbs, 13.7kg
BLE-1T261	Replacement 25-watt bulb		

Large Viewing and Photographic Cabinets, CC- and CL-Series

- Modular design allows for adaptation of interchangeable Spectroline UV lamps
- Complete with an internal 25-watt white light bulb
- Specially designed port allows for safety viewing eyepiece or the substitution of a "snap-on" camera adapter for photography

Our CC-80 and CL-150 fluorescence analysis cabinets offer both superior fluorescence viewing and instant photo documentation of research findings. They feature a modular design which lets you vary UV wavelengths with interchangeable Spectroline UV lamps; maximize fluorescent contrast by adding a Spectroline transilluminator and document your results with "snap-on" Spectroline camera adapters. Visible epi-illumination is provided by an internal 25-watt white light bulb.

Rugged and durable, both cabinets are made of aluminum with a chemical-resistant polyurethene coating. Felt curtains permit easy access to the interior while blocking out ambient light. All light control switches are conveniently located on the top of the cabinets. When maximum intensity is desired dual lamps can be operated simultaneously in those cabinets that accept two lamps. CC-80 cabinets accommodate our E-series lamps (6 or 8-watt, single or double tube models), whereas CL-150 cabinets accommodate our X-series lamps (15-watt, single or double tube models).

The spacious CC-80 cabinet accepts standard gels and up to two 8" x 8" (20 x 20cm) TLC plates, while the even roomier CL-150 can easily accommodate larger gels and up to four 8" x 8" plates. The CC-81 workstation includes CC-80 cabinet with ENF-280C lamp with separate 8-watt LW (365nm) and SW (254nm) UV tubes. Whereas the CL-151 includes CL-150 cabinet with XX-15NF lamp with separate 15-watt LW and SW UV tubes.

CC-80 Series

- Overall housing dimensions (W x L x H): 17.5" x 20.25" x 9.75", 44.5 x 51.4 x 24.8cm
- Net Weight: 11.5 lbs, 5.2kg

CL-150 Series

- Overall housing dimensions (W x L x H): 19.5" x 24.25" x 12.75", 49.5 x 61.6 x 32.4cm
- Net Weight: 15.0 lbs, 6.8kg

Model	Product	UV Tubes
CC-80	Cabinet with white light bulb	Optional E-series Lamp
CC-81	CC-80 cabinet with ENF-280C lamp	8W, 365nm/254nm
CL-150	Cabinet with white light bulb	Optional X-series Lamp
CL-151	CL-150 cabinet with XX-15NF lamp	15W, 354nm/254nm
BLE-1T261	Replacement 25-watt white light bulb	

Accessories for Photo Documentation Workstations

For use with all Spectroline cabinets, Spectronics carries a full line of UV lamps and transilluminators as well as additional camera adapters/filters for CC-80 and CL-150 photo documentation workstations. Refer to appropriate sections for complete listings.
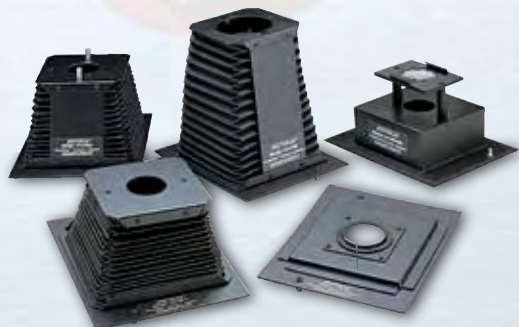
- Publication-quality images
- Custom "snap-on" adapters for both CC- and CL-series
- Compatible with Polaroid and SLR cameras
- Gelatin filters provide contrast for specific film documentation

Spectroline camera adapters help produce publication-quality digital images, prints, transparencies or negative of samples with light-tight, custom "snap-on" camera adapters. They make the CC-80 and CL-150 instantly compatible with Polaroid DS-34, CU-5 and MP-4 camera systems as well as 35mm SLR camera. Simply snap any of the light-tight adapters onto the cabinet in place of the UV-absorbing eyepiece then add an applicable gelatin filter to produce prints, transparencies or negatives of samples.

Fluorescence Analysis Workstations

Camera Adapters

- Port opening dimensions (L x W): 8" x 6.5", 20.3 x 16.5 cm

Model	Camera/Field of view	Cabinet	Height	Net Weight
CA-35	35mm SLR / 8" x 10"	CC-80 and CL-150	0.625", 1.6cm	0.5 lb, 0.2kg
CA-CU5	Polaroid CU-5 / 8" x 10"	CC-80	6.625", 17.0cm	0.75 lb, 0.3kg
CA-CU5/L	Polaroid CU-5 / 8" x 10"	CL-150	3.625", 9.2cm	0.75 lb, 0.3kg
CA-DS34	Polaroid DS-34 / 8" x 10"	CC-80	4.0", 10.2cm	0.75 lb, 0.3kg
CA-DS34/L	Polaroid DS-34 / 8" x 10"	CL-150	1.0", 2.5cm	0.75 lb, 0.3kg
CA-DS34/M	Polaroid DS-34 / 4" x 5"	CC-80	3.0", 7.6cm	1.0 lb, 0.5kg
CA-DS34/LM	Polaroid DS-34 / 4" x 5"	CL-150	5.0", 12.7cm	1.0 lb, 0.5kg
CA-MP4	Polaroid MP-4	CC- and CL-150 series	6.125", 15.6cm	1.0 lb, 0.5kg

Gelatin (Wratten) Filters

Model	Product	Film type	Contrast
GF-2A	Clear Filter	Color	Absorbs UV, no contrast
GF-22	Orange Filter	Black & White	Absorbs UV and increases contrast
GF-25	Red Filter	Black & White	Absorbs UV and increases contrast

Polaroid Camera and Filters

- DS-34 Polaroid instant camera with 105mm f/4.5 lens and pistol grip
- Uses color (Type 679) and B&W (Type 667) with $3\frac{1}{4}$" x $4\frac{1}{4}$" film format
- Various photographic solid glass filters to fit DS-34 (40.5mm screw-on type) for adding contrast as well as enhancing detailed clarity to bands and images

PhotoDoc™ Hoods

- Full line of camera hoods with attached lens for 4-5mm focus inside hood
- Available with varying internal dimensions
- Perfect for use with Spectroline transilluminators

Polaroid Camera Hoods

Model	Internal Dimensions	Image Magnification
CH-710	$3\frac{13}{16}$" x $4\frac{5}{16}$", 9.7 x 11.8cm	0.91
CH-810	$3\frac{7}{8}$" x $3\frac{15}{16}$", 7.9 x 10cm	0.90
CH-1012	$3\frac{13}{16}$" x $4\frac{11}{16}$", 9.65 x 11.9cm	0.80
CH-1013	$4\frac{15}{16}$" x $5\frac{9}{16}$", 11 x 14.2cm	0.69
CH-1216	$6\frac{1}{8}$" x $4\frac{7}{16}$", 11.3 x 15.6cm	0.63
CH-1314	$5\frac{3}{16}$" x $5\frac{9}{16}$", 13.1 x 14.2cm	0.70
CH-1317	5" x $6\frac{9}{16}$", 12.7 x 16.7cm	0.55
CH-1520	5" x $7\frac{1}{16}$", 12.7 x 17.9cm	0.55
CH-1623	$5\frac{3}{16}$" x $8\frac{11}{16}$", 14.8 x 22.1cm	0.43
CH-1723	$6\frac{3}{4}$" x $9\frac{7}{16}$", 17.2 x 24cm	0.41
CH-1927	$7\frac{3}{16}$" x $10\frac{3}{16}$", 18.2 x 25.9cm	0.36
CH-2128	$8\frac{7}{16}$" x $10\frac{5}{8}$", 21.5 x 27cm	0.35
CH-2330	$8\frac{3}{8}$" x $11\frac{3}{16}$", 21.3 x 28.4cm	0.35

Polaroid Camera and Filters

Model	Product	Polaroid film type	Contrast
DS-34	Polaroid Camera	Any	
SF-2A	Clear Filter	Color	Absorbs UV, no contrast
SF-8	Yellow Filter	Black & White	Absorbs UV, contrast for coomassie blue stained samples
SF-15	Light Orange Filter	Black & White	Absorbs UV, contrast for fluorescent/SYBR green stained gels
SF-23A	Orange Filter	Black & White	Absorbs UV, contrast for fluorescent/Et Br stained gels
SF-25	Red Filter	Black & White	Absorbs UV, contrast for fluorescent stained gels
SF-58	Green Filter	Black & White	Absorbs UV, contrast for silver stained gels

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Hand-Held UV Lamps

Features

- Choice of 4-watt, 5-watt, 6-watt and 8-watt models
- Available in all UV wavelengths (LW, MW, SW) as well as germicidal lamps
- Single and dual wavelength combinations
- Filtered and unfiltered LW UV tubes
- Offered with or without filter assemblies
- Compact and lightweight of anodized aluminum housing
- Convenient carrying handle that snaps off for use with lamp stand

The compact **E-series** lamps provide various combinations of long, medium and/or short wave UV. A corrosion-resistant, specular-aluminum reflector optimizes UV irradiance. All SW and MW models feature a unique LONGLIFE™ filter glass for higher initial UV transmission and maximum resistance to solarization. These lamps are available in choices of integrally filtered LW tubes (BLB) or unfiltered UV tubes with or without separate filter assemblies. Lamps with unfiltered tubes produce higher UV intensity while double-tube units provide broader UV coverage than their single-tube counterparts. Color-coded on/off switches, conveniently located at the top of the units, put irradiance control at your fingertips. The anodized-aluminum lamp housings are extremely rugged and durable. All lamps include a removable carrying handle. An optional lamp stand, shown at right, is available for hands-free operation.

Single Wavelength, E-Series

Long wave, LW (UV-A, 365nm)

- Integrally filtered tube (BLB) or unfiltered tube (BL)
- With or without filter assembly (FA)

Model	UV Tube(s)	Filter Assembly	Dimensions (W x L x H)	Net Weight
EA-140	One 4-watt BLB, BLE-220B	--	3.25" x 7" x 2.5", 8.3 x 17.8 x 6.4cm	1.75 lbs, 0.8kg
EN-140	One 4-watt BL, BLE-270W	--	3.25" x 7" x 2.5", 8.3 x 17.8 x 6.4cm	1.75 lbs, 0.8kg
EN-140L	One 4-watt BL, BLE-270W with FA	2F003	3.25" x 8" x 2.5", 8.3 x 20.3 x 6.4cm	2.0 lbs, 0.9kg
EA-240	Two 4-watt BLB, BLE-220B	--	3.25" x 7" x 2.5", 8.3 x 17.8 x 6.4cm	1.75 lbs, 0.8kg
EA-150	One 5-watt BLB, BLE-5T365B	--	3.25" x 8" x 2.5", 8.3 x 20.3 x 6.4cm	2.0 lbs, 0.9kg
EA-160	One 6-watt BLB, BLE-480B	--	3.25" x 10.25" x 2.5", 8.3 x 26.0 x 6.4cm	2.0 lbs, 0.9kg
EN-160	One 6-watt BL, BLE-6T365	--	3.25" x 10.25" x 2.5", 8.3 x 26.0 x 6.4cm	2.0 lbs, 0.9kg
EN-160L	One 6-watt BL, BLE-6T365 with FA	2F005	3.25" x 10.25" x 2.5", 8.3 x 26.0 x 6.4cm	2.5 lbs, 1.1kg
EA-180	One 8-watt BLB, BLE-760B	--	3.25" x 13.25" x 2.5", 8.3 x 33.7 x 6.4cm	2.25 lbs, 1.0kg
EN-180	One 8-watt BL, BLE-8T365	--	3.25" x 13.25" x 2.5", 8.3 x 33.7 x 6.4cm	2.25 lbs, 1.0kg
EN-180L	One 8-watt BL, BLE-8T365 with FA	2F082	3.25" x 13.25" x 2.5", 8.3 x 33.7 x 6.4cm	2.75 lbs, 1.2kg
EN-280L	Two 8-watt BL, BLE-8T365 with FA	2F082	3.25" x 13.25" x 2.5", 8.3 x 33.7 x 6.4cm	2.75 lbs, 1.2kg

Standard Intensity Ultraviolet Lamps

Standard Intensity Ultraviolet Lamps

Medium wave, MW (UV-B, 312nm)
- Unfiltered tube
- With LONGLIFE™ filter assembly (FA)

Model	UV Tube(s)	Filter Assembly	Dimensions (W x L x H)	Net Weight
EB-160C	One 6-watt MW, BLE-6T312	2F006	3.25" x 10.25" x 2.5", 8.3 x 26.0 x 6.4cm	2.5 lbs, 1.1kg
EB-180C	One 8-watt MW, BLE-8T312	2F018	3.25" x 13.25" x 2.5", 8.3 x 33.7 x 6.4cm	2.75 lbs, 1.2kg
EB-280C	Two 8-watt MW, BLE-8T312	2F018	3.25" x 13.25" x 2.5", 8.3 x 33.7 x 6.4cm	2.75 lbs, 1.2kg

Short wave, SW (UV-C, 254nm)
- Unfiltered tube
- With LONGLIFE™ filter assembly (FA)

Model	UV Tube(s)	Filter Assembly	Dimensions (W x L x H)	Net Weight
EF-140C	One 4-watt SW, BLE-2537S	2F001	3.25" x 8" x 2.5", 8.3 x 20.3 x 6.4cm	2.0 lbs, 0.9kg
EF-160C	One 6-watt SW, BLE-6254S	2F006	3.25" x 10.25" x 2.5", 8.3 x 26.0 x 6.4cm	2.5 lbs, 1.1kg
EF-180C	One 8-watt SW, BLE-8T254	2F018	3.25" x 13.25" x 2.5", 8.3 x 33.7 x 6.4cm	2.75 lbs, 1.2kg
EF-260C	Two 6-watt SW, BLE-6254S	2F006	3.25" x 10.25" x 2.5", 8.3 x 26.0 x 6.4cm	2.75 lbs, 1.2kg
EF-280C	Two 8-watt SW, BLE-8T254	2F018	3.25" x 13.25" x 2.5", 8.3 x 33.7 x 6.4cm	2.75 lbs, 1.2kg

Dual Wavelength, E-Series
- Unfiltered long, medium and short wave tubes
- With LONGLIFE™ filter assembly (FA)

Long wave (UV-A, 365nm) / Short wave (UV-C, 254nm)

Model	UV Tube(s)	Filter Assembly	Dimensions (W x L x H)	Net Weight
ENF-240C	One 4-watt BL, BLE-270W One 4-watt SW, BLE-2537S	2F001	3.25" x 8" x 2.5", 8.3 x 20.3 x 6.4cm	2.0 lbs, 0.9kg
ENF-260C	One 6-watt BL, BLE-6T365 One 6-watt SW, BLE-6254S	2F006	3.25" x 10.25" x 2.5", 8.3 x 26.0 x 6.4cm	2.5 lbs, 1.1kg
ENF-280C	One 8-watt BL, BLE-8T365 One 8-watt SW, BLE-8T254	2F018	3.25" x 13.25" x 2.5", 8.3 x 33.7 x 6.4cm	2.75 lbs, 1.2kg

Long wave (UV-A, 365nm) / Medium wave (UV-B, 312nm)

Model	UV Tube(s)	Filter Assembly	Dimensions (W x L x H)	Net Weight
ENB-260C	One 6-watt BL, BLE-6T365 One 6-watt MW, BLE-6T312	2F006	3.25" x 10.25" x 2.5", 8.3 x 26.0 x 6.4cm	2.5 lbs, 1.1kg
ENB-280C	One 8-watt BL, BLE-8T365 One 8-watt MW, BLE-8T312	2F018	3.25" x 13.25" x 2.5", 8.3 x 33.7 x 6.4cm	2.75 lbs, 1.2kg

Medium wave (UV-B, 312nm) / Short wave (UV-C, 254nm)

Model	UV Tube(s)	Filter Assembly	Dimensions (W x L x H)	Net Weight
EBF-260C	One 6-watt MW, BLE-6T312 One 6-watt SW, BLE-6254S	2F006	3.25" x 10.25" x 2.5", 8.3 x 26.0 x 6.4cm	2.5 lbs, 1.1kg
EBF-280C	One 8-watt MW, BLE-8T312 One 8-watt SW, BLE-8T254	2F018	3.25" x 13.25" x 2.5", 8.3 x 33.7 x 6.4cm	2.75 lbs, 1.2kg

Germicidal, E-Series
- Unfiltered short wave (UV-C) tubes without filter assembly

Model	UV Tube	Filter Assembly	Dimensions (W x L x H)	Net Weight
EF-140	One 4-watt SW, BLE-2537S	--	3.25" x 7" x 2.5", 8.3 x 17.8 x 6.4cm	1.75 lbs, 0.8kg
EF-160	One 6-watt SW, BLE-6254S	--	3.25" x 10.25" x 2.5", 8.3 x 26.0 x 6.4cm	2.0 lbs, 0.9kg
EF-180	One 8-watt SW, BLE-8T254	--	3.25" x 13.25" x 2.5", 8.3 x 33.7 x 6.4cm	2.25 lbs, 1.0kg

Accessories for E-Series Lamps
SE-140	Lamp Stand
CH-180	Carrying Handle

UV Bench and Display Lamps

Features

- Choice of 15-watt, 30-watt and 40-watt models
- Available in all UV wavelengths (LW, MW and SW) as well as germicidal lamps
- Single- and double-tube combinations
- Filtered UV-A and unfiltered UV tubes
- Offered with or without filter assemblies
- 15-watt models with anodized aluminum housing
- 30- and 40-watt models with enameled sheet metal housing
- Outfitted with sturdy metal brackets for easy overhead mounting

X-series lamps are ideally suited for applications where high-intensity, wide-area UV coverage is required. Constructed of rugged metal with sturdy mounting brackets, these units are available in various combinations of long, medium and/or short wave UV. The complete line also offers lamps in a wide choice of various intensities, sizes and-wattage, including single or double UV tubes. A corrosion-resistant aluminum reflector optimizes UV irradiance while all short and medium wave models feature our unique LONGLIFE™ filter glass to ensure high initial UV intensity. These versatile lamps are also a key component of our CL-150 UV photo documentation system. They offer easy wavelength interchangeability making this system ideal for numerous applications requiring a darkened environment.

Single Wavelength, X–Series

Long wave, LW (UV-A, 365nm)

- Integrally filtered tube (BLB) or unfiltered tube (BL)
- With or without filter

Model	UV Tube(s)	Filter	Dimensions (W x L x H)	Net Weight
X-15A	One 15-watt BLB, BLE-1800B	--	4.5" x 18.75" x 3.5", 11.4 x 47.6 x 8.9cm	4.5 lbs, 2.0kg
X-15N	One 15-watt BL, BLE-1T151 with filter	2F501	4.5" x 18.75" x 3.5", 11.4 x 47.6 x 8.9cm	6.25 lbs, 2.8kg
X-30	One 30-watt BLB, BLE-5000B	--	6" x 36" x 4", 15.2 x 91.4 x 10.2cm	9.25 lbs, 4.3kg
X-40	One 40-watt BLB, BLE-7900B	--	6" x 48" x 4", 15.2 x 121.9 x 10.2cm	12.0 lbs, 5.4kg
XX-15A	Two 15-watt BLB, BLE-1800B	--	4.5" x 18.75" x 3.5", 11.4 x 47.6 x 8.9cm	5.5 lbs, 2.5kg
XX-15N	Two 15-watt BL, BLE-1T151 with filter	2F501	4.5" x 18.75" x 3.5", 11.4 x 47.6 x 8.9cm	6.5 lbs, 2.9kg
XX-40	Two 40-watt BLB, BLE-7900B	--	6" x 36" x 4", 15.2 x 91.4 x 10.2cm	14.0 lbs, 6.4kg
XX-40N	Two 40-watt BLB, BLE-7900B with filter	2F951	6" x 36" x 4", 15.2 x 91.4 x 10.2cm	17.5 lbs, 7.9kg

Standard Intensity Ultraviolet Lamps

Standard Intensity Ultraviolet Lamps

Medium wave, MW (UV-B, 312nm)

- Unfiltered tube
- With LONGLIFE filter

Model	UV Tube(s)	Filter	Dimensions (W x L x H)	Net Weight
X-15B	One 15-watt MW, BLE-1T158	2F508	4.5" x 18.75" x 3.5", 11.4 x 47.6 x 8.9cm	6.25 lbs, 2.8kg
XX-15B	Two 15-watt MW, BLE-1T158	2F508	4.5" x 18.75" x 3.5", 11.4 x 47.6 x 8.9cm	6.5 lbs, 2.9kg

Short wave, SW (UV-C, 254nm)

- Unfiltered tube
- With LONGLIFE filter

Model	UV Tube(s)	Filter	Dimensions (W x L x H)	Net Weight
X-15F	One 15-watt SW, BLE-1T155	2F508	4.5" x 18.75" x 3.5", 11.4 x 47.6 x 8.9cm	6.25 lbs, 2.8kg
XX-15F	Two 15-watt SW, BLE-1T155	2F508	4.5" x 18.75" x 3.5", 11.4 x 47.6 x 8.9cm	6.5 lbs, 2.9kg

Multi Wavelength, X–Series

- Unfiltered long, medium and short wave tubes
- With LONGLIFE filter

Long wave (UV-A, 365nm) / Short wave (UV-C, 254nm)

Model	UV Tube(s)	Filter	Dimensions (W x L x H)	Net Weight
XX-15NF	One 15-watt BL, BLE-1T151 One 15-watt SW, BLE-1T155	2F508	4.5" x 18.75" x 3.5", 11.4 x 47.6 x 8.9cm	6.5 lbs, 2.9kg

Long wave (UV-A, 365nm) / Medium wave (UV-B, 312nm)

Model	UV Tube(s)	Filter	Dimensions (W X L X H)	Net Weight
XX-15NB	One 15-watt BL, BLE-1T151 One 15-watt MW, BLE-1T158	2F508	4.5" x 18.75" x 3.5", 11.4 x 47.6 x 8.9cm	6.5 lbs, 2.9kg

Medium wave (UV-B, 312nm) / Short wave (UV-C, 254nm)

Model	UV Tube(s)	Filter	Dimensions (W X L X H)	Net Weight
XX-15BF	One 15-watt MW, BLE-1T158 One 15-watt SW, BLE-1T155	2F508	4.5" x 18.75" x 3.5", 11.4 x 47.6 x 8.9cm	6.5 lbs, 2.9kg

Germicidal, X–Series

- Unfiltered short wave (UV-C) tubes without filter

Model	UV Tube(s)	Filter	Dimensions (W X L X H)	Net Weight
X-15G	One 15-watt SW, BLE-1T155	--	4.5" x 18.75" x 3.5", 11.4 x 47.6 x 8.9cm	4.5 lbs, 2.0kg
X-30G	One 30-watt SW, BLE-1T305	--	6" x 36" x 4", 15.2 x 91.4 x 10.2cm	9.25 lbs, 4.3kg
XX-15G	Two 15-watt SW, BLE-1T155	--	4.5" x 18.75" x 3.5", 11.4 x 47.6 x 8.9cm	5.5 lbs, 2.5kg

Digital Radiometers/Photometers

Designed for maximum accuracy and versatility, Spectroline® digital radiometers are available in four distinct series offering a variety of features for measuring ultraviolet and/or visible light sources. All radiometers are housed in durable polycarbonate and are lightweight, battery-operated and portable. Units feature solid-state electro-optical circuitry for long, trouble-free operation and minimal maintenance.

The AccuMAX™ series meters feature an advanced microprocessor-controlled, multi-wavelength capable readout unit with software-driven functions, user-customized settings and a wide selection of interchangeable, single-wavelength sensor detectors. A dual-wavelength sensor detector that measures both UV and visible light is also available. Single-wavelength DM-series radiometers combine a readout unit and a single sensor in one unit. DRC-series versions utilize a single readout unit with interchangeable sensors for multiple-wavelength capability, including a visible light sensor. DSE-2000 kits are available combining a single UV/visible readout unit with UV-A and visible sensors packaged in a convenient carrying case.

All of our radiometers are outfitted with high-quality interference filters with well-defined transmission bands to resist degradation and eliminate light sensitivity to infrared and other undesirable radiation. The sensor heads are provided with special diffusers that ensure accurate cosine response. For maximum calibration accuracy, these units use the electrically calibrated pyroelectric radiometer (ECPR) method of calibrating directly traceable to NIST standards. A calibration certificate is provided with every unit.

Product Lines

AccuMAX™ Series
- Advanced microprocessor-controlled meter with interchangeable sensor detectors
- Software-driven functions; user-interface customized settings and three main operation modes
- Choice of direct or USB cable connection between readout unit and sensor detector

DM-Series
- Single-wavelength capable UV sensor/readout unit

DRC-Series
- Multi-wavelength capable UV radiometers
- Single-connector UV readout unit with interchangeable sensors

DSE-Series
- Multi-wavelength capable UV radiometer and visible photometer
- Single-connector UV/visible readout unit with interchangeable sensors

DSE-2000 Kits
Includes:
- Readout unit
- UV-A and visible light sensors (available in foot-candle or lux versions)
- Includes black light and visible light sensors
- Convenient carrying case

Features

- Overall accuracy of $\pm5\%$ directly traceable to NIST standards
- AccuMAX series sensors available in both standard and extended range versions
- Two irradiance range categories for DM-, DRC- and DSE series: H and X versions
- Sealed silicone diode housed in liquid- and water-resistant sensor housing is protected from shock, humidity and light leakage
- Broader bandpass interference filter prevents stray radiation readings
- Auto-zeroing, excellent linearity and cosine response
- Solid-state design for compact, durable radiometers with simple operation and battery-level indicator
- AccuMAX series powered by two 9V alkaline batteries, DM- and DSE-series powered by four 1.5V alkaline batteries and DRC-series powered by one 9V alkaline battery. Batteries included with all units.

Digital Radiometers/Photometers

Digital Radiometers/Photometers

Digital Microprocessor-Controlled Meters, AccuMAX™ Series

- Features two advanced digital, microprocessor-controlled readout units (XF-1000 for fluorescent UV tubes; XR-1000 for HID UV bulbs) specially calibrated to complement a full line of interchangeable AccuMAX series sensor detectors
- Software-driven functions provide multifaceted light level reading
- Five user-customized settings and three main operation modes (absolute data/normal, autozeroing and integration) featuring hold, peak and back functions
- Overall accuracy of better than ±5% with reference to NIST standards
- Choice of direct or USB cable connection between sensor detector and readout unit
- Large, easy-to-read monochrome LCD screen
- Automatic shutoff and user-defined power save features
- Powered by two 9-volt alkaline batteries (included)
- Readout unit dimensions (W x L x H) : 4.25 in x 7.75 in x 1.25 in, 10.8 cm x 19.7 cm x 3.2 cm)
- Readout unit weight: 1.1 lb (499 g)

The **AccuMAX series** is designed to provide accurate readouts for UV irradiance, visible illuminance or luminance light readings. When equipped with an interchangeable sensor detector, the AccuMAX readout unit can be used to perform fluorescent inspection (intensity check through normal operation) and UV dosing (energy check through integration operation). Both the XR-1000 and XF-1000 readout units feature a sleek design and rugged housing, maximum 4-digit autoranging and easy-to-read 3 inch monochrome LCD screen with icons and alphanumeric display. A removable, rubber protective boot for the meter is included. A padded carrying case is available as an accessory.

Model	Readout Unit
XF-1000	Calibrated for fluorescent UV tubes
XR-1000	Calibrated for HID UV bulbs

AccuMAX sensor detectors are designed to meet virtually any laboratory or life science application. These detectors feature water-resistant, sealed sensor housings, superior bandpass interference filters and excellent cosine response. Single-wavelength detectors are available in both standard range (XS-series), ideal for checking the intensity of fluorescent UV tubes and HID UV bulbs, and extended range (XTS-series), useful for high-intensity light sources used in curing and photoactivation applications. Also available are a single-wavelength visible illuminance detector (XS-555/I) and a luminance detector (XS-555/L). In addition, a dual-wavelength UV/VIS sensor detector (XDS-1000) is available to measure both UV-A and visible light, useful for industrial inspections. All sensors can easily be connected to the readout unit either directly or with a standard USB cable. A special 5 foot USB cable with water-resistant adapter (XCB-100) is available as an accessory.

Model	Dimensions (W X L X H)	Net Weight
Single Sensor	(W x L x H) : 2.0 in x 3.0 in x 7/8, (5.1 cm x 7.6 cm x 2.2 cm)	2.4 oz (68 g)
Luminance Sensor	(W x L x H): 2.1 in x 3.0 in x 3.2 in, (5.3 cm x 7.6 cm x 8.1 cm)	6.4 oz (181 g)
Dual Sensor	(W x L x H): 2.0 in x 4.75 in x 7/8, (5.1 cm x 12.1 cm x 2.2 cm)	3.2 oz (91 g)

Model	Sensors	Spectral Range	Range in Units
XS-254	UV-C	254nm	0-100 mW/cm^2
XTS-254	UV-C	254nm	0-3W/cm^2
XS-300	UV-B	300nm	0-100 mW/cm^2
XTS-300	UV-B	300nm	0-3W/cm^2
XS-365	UV-A	365nm	0-100 mW/cm^2
XTS-365	UV-A	365nm	0-3W/cm^2
XS-405	UV-V	405nm	0-100 mW/cm^2
XTS-405	UV-V	405nm	0-3W/cm^2
XS-450	Bilirubin	450nm	0-100 mW/cm^2
XTS-450	Bilirubin	450nm	0-3W/cm^2
XS-555/I	Visible illuminance	555nm	0-5,300 lux, 0-500 fc
XS-555/L	Visible luminance	555nm	0-1,000,000 cd/m^2, 0-90,000 cd/ft^2, 0-285,000 fL
XDS-1000 Dual UV-A/VIS {	UV-A	365nm	0-100 mW/cm^2
	Visible illuminance	555nm	0-5,300 lux, 0-500 fc
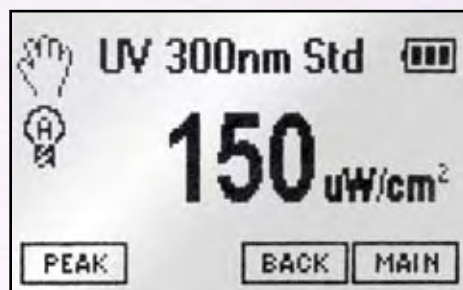
- Four side-by-side buttons provide for easy operation of user-intuitive interactive functions
- Menu-driven, user-selectable settings; customized visible units of measurement and backlight display to suit operating conditions
- Screen displays meter status, battery power level, light intensity, wave type readings and user-available functions
- Multiple-function control of main operational modes: absolute data/normal, autozeroing and integration
- Multifaceted light level reading and access to additional features (peak, hold and back screen) embedded within main operational modes
- Integration (INTG) mode sums up cumulative ultraviolet light exposed to sensor over an interval of time – useful for UV dosing applications

The AccuMAX meter's microprocessor-controlled software is the key to its user-friendly operation, advanced functionality and accurate readouts. Four pressure-sensitive buttons on the readout unit's membrane keypad offer an extensive array of advanced features. The software-driven function menu gives full access to the three main operating modes: absolute data/normal, automatic zero and integration. To save battery power, the meter automatically shuts off after 10 minutes of non-use in all modes, with the exception of integration. In addition, the software allows the user to customize units of measurement for visible light readouts, as well as LCD screen backlight settings. These functions and other user-selectable parameters are easily accessible though the software's main and subordinate menus.

Customizing Settings

The AccuMAX provides users the capability of selecting the default visible unit of measurement in their choice of foot-candles (fc), lux, lm/ft^2 or lm/m^2. The user can also select and adjust the display contrast, backlight brightness and interval between active and passive operations, which also helps conserve battery power. Unless the meter is at low-battery status, all user-selectable parameters will be saved and used for future meter operations.

Operational Modes

Absolute Data/Normal

This mode will measure the real-time absolute total light to which the sensor is exposed. The HOLD function is accessible in this mode, giving the user the option to freeze the reading and display the data. The PEAK feature is also available in this mode, which will freeze and display the highest intensity reading recorded during normal operation.

Automatic Zero

In this mode, the AccuMAX automatically subtracts "unwanted" ambient light when measuring light output. All subsequent measurement readings will be relative to this zero light level, saving the user data-recording time. The HOLD and PEAK features are also accessible in this mode.

Integration (INTG)

In the integration mode, the meter sums up the cumulative ultraviolet light that the sensor is exposed to over an interval of time, then displays the resultant total energy absorbed in joules. This mode is useful for UV dosing applications when checking energy levels of the light source used. In this mode, the freeze feature will hold the displayed data static while continuing the integration process in the background. For convenience, the AccuMAX will not shut off automatically after 10 minutes (as it would in other functions), allowing the user to continue integrating for extended periods of time.

Digital Radiometers/Photometers

Single-Wavelength Digital Radiometers, DM-Series

- Overall accuracy of better than ±5% with reference to NIST standards
- Single units for short wave, long wave and solar UV measurements
- DM-H series measure up to 199,990 µW/cm² (199.9 mW/cm²)
- DM-X series measure up to 19,990 µW/cm²
- Easy to read large, 4 digit, LED display with low battery indicator
- Powered by four (4)1.5V alkaline batteries (included) or four (4) rechargeable 1.25V NiCad (optional)
- Readout dimensions (W x L x H): 3.5" x 7.25" x 2", 18.4 x 8.9 x 5.1cm
- Readout net weight: 1 lb, 0.45kg
- Sensor dimensions (W x L x H): 2" x 3" x 0.7", 5.1 x 7.6 x 1.7cm
- Sensor net weight: 1.25 oz, 35.4gm
- Sensor cord length: 3 ft, 91.4cm

The **DM-series** radiometers are offered as separate units to measure light sources in the short wave, long wave and solar UV ranges. Direct intensity readings provided in µW/cm² over a range of 10 µW/cm² up to 199,990 µW/cm² (depending on H or X versions) — more than ample for high intensity UV sources. The red LED display is equally accurate in dark environment or under ambient light conditions. The housing protects the sensor cell from shock and isolates the photo detectors from thermal gradients during handling, ensuring drift-free measurements. Coiled sensor cord is conveniently stored in readout unit.

Model	Wavelength	Sensor Spectral Range	Irradiance Range	Resolution
DM-254HA	Short wave	230-280nm	0-199,990 µW/cm²	100 µW/cm²
DM-254XA	Short wave	230-280nm	0-19,990 µW/cm²	10 µW/cm²
DM-365HA	Long wave	320-400nm	0-199,990 µW/cm²	100 µW/cm²
DM-365XA	Long wave	320-400nm	0-19,990 µW/cm²	10 µW/cm²
DM-3500A	Solar UV	300-400nm	0-19,990 µW/cm²	10 µW/cm²

Multi-Wavelength Digital UV Radiometers, DRC-Series

- Overall accuracy of better than ±5% with reference to NIST standards
- Single readout unit for interchangeable sensors in both H and X versions
- Combines with separate DIX-sensors for short wave, long wave and blue light measurements
- DRC-H version measures up to 199,990 µW/cm² (199.9 mW/cm²)
- DRC-X version measures up to 19,990 µW/cm²
- Easy to read large, 4 digit, LCD display with low battery indicator
- Powered by one (1) 9V alkaline battery (included)
- Readout dimensions (W x L x H): 3.5" x 7.25" x 2", 18.4 x 8.9 x 5.1cm
- Readout net weight: 0.75 lb, 0.34kg

The **DRC-series** readout units measure both ultraviolet and blue light through the use of interchangeable DIX-series sensors (next page) that are individually calibrated. All readout units are equipped with an auto-zeroing feature as well as low-battery display indicating the need for battery replacement.

Model	Readout Unit	Irradiance Range	Resolution
DRC-100H	UV	0-199,990 µW/cm²	100 µW/cm²
DRC-100X	UV	0-19,990 µW/cm²	10 µW/cm²

Multi-Wavelength Digital UV/Visible Radiometers, DSE-Series

- Overall accuracy of better than ±5% with reference to NIST standards
- Single readout for interchangeable UV and visible light sensors
- Combines with separate DIX-sensors for UV and visible light measurements
- DSE-H versions measure up to 199,990 µW/cm^2 (199.9 mW/cm^2)
- DSE-X versions measure up to 19,990 µW/cm^2
- Easy to read large, 4 digit, LED display with low battery indicator
- Powered by four (4) 1.5V alkaline batteries (included) or four (4) rechargeable 1.25V NiCad (optional)
- Readout dimensions (W x L x H): 3.5" x 7.25" x 2", 18.4 x 8.9 x 5.1cm
- Readout net weight: 1 lb, 0.45kg

The DSE-series readout units eliminate the need for two separate DM meters. Through the use of interchangeable DIX-series sensors, the DSE-series digital UV/visible radiometers provide UV and visible light readings. All models have an overall accuracy of better than ± 5%, traceable to NIST standards. Dual-operation toggle switch provides two position options–*Ultraviolet* with measurements in microwatts per centimeter square (µW/cm^2) and *Visible* with measurements in footcandles (fc) or lux .

Model	Readout Unit	UV Irradiance Range	Resolution	Visible	Resolution
DSE-100H	UV/Visible	0-199,990 µW/cm^2	100 µW/cm^2	0-1,999 fc	1fc
DSE-100H/L	UV/Visible	0-199,990 µW/cm^2	100 µW/cm^2	0-19,990 lux	10 lux
DSE-100X	UV/Visible	0-19,990 µW/cm^2	10 µW/cm^2	0-199.9 fc	0.1fc
DSE-100X/L	UV/Visible	0-19,990 µW/cm^2	10 µW/cm^2	0-1,999 lux	1 lux

Multi-Wavelength Sensors, DIX-Series

Each component is designed to yield maximum accuracy. Pyroelectric/photometric calibration of sensors provides superior linearity, excellent signal-to-noise ratio and controlled spectral response. Rugged, silicon photodiode is sealed and fixed in a metal/quartz package to protect against adverse effects of shock and humidity, eliminating the possibility of photodiode fracture. Liquid-resistant sensor housing protects against moisture. For maximum versatility, the DIX-series sensors connect easily to the readout units by a 4-foot (121.9cm) detachable cord; longer cords are available on special order.

- Overall sensor dimensions (W x L x H): 2" x 3" x 0.7", 5.1 x 7.6 x 1.7cm
- Net weight: 1.25 oz, 35.4gm
- Cord length: 4 ft, 121.9cm

Model	Sensors	Spectral Range	Radiometer Models
DIX-254A	Short wave UV	230-280nm	DRC- and DSE-series
DIX-300A	Medium wave UV	280-320nm	DRC- and DSE-series
DIX-365A	Long wave UV	320-400nm	DRC- and DSE-series
DIX-405A	Violet light	395-415nm	DRC- and DSE-series
DIX-555A	Visible light	380-760nm	DSE-series
DIX-555A/L	Visible light	380-760nm	DSE-series

Digital Radiometers/Photometers

Digital Radiometers/Photometers

UV/Visible Digital Radiometer Kits, DSE-2000 Series

- Overall accuracy of better than ±5% with reference to NIST standards
- Single DSE-series readout unit for interchangeable DIX-series sensors
- Includes black light sensor (365nm) and visible sensor (555nm)
- Complete with DR-75 carrying case

Specifically combined high-visibility digital display and dual-measuring capability using interchangeable sensors make the DSE-2000 series radiometer/photometer systems exceedingly easy to use. Readout unit offers advanced electronic circuitry and auto-zeroing feature. UV sensor utilizes well-defined band pass interference filter to ensure accurate intensity measurements. For added convenience, DR-75 carrying case is designed to hold one readout unit and four sensors.

Model	Readout Unit	UV Sensor Unit	Visible Sensor Unit
DSE-2000A	DSE-100X	DIX-365A	DIX-555A
DSE-2000A/L	DSE-100X/L	DIX-365A	DIX-555A/L
DSE-2000HA	DSE-100H	DIX-365A	DIX-555A
DSE-2000HA/L	DSE-100H/L	DIX-365A	DIX-555A/L

Accessories/Replacement Parts for Digital Radiometers

Model	Product	Radiometer Models
XCB-100	Water-resistant USB connector cable with adapter, 5 ft (1.5 m)	AccuMAX series
XRB-100	Rubber boot for digital readout unit	AccuMAX series
XCC-100	Padded carrying case	AccuMAX series
DM-N4	NiCad rechargeable battery, 1.25V (four required)	DM- and DSE-series
DM-15C0001	Recharger for DM-N4 batteries	DM- and DSE-series
DR-75	Carrying case for radiometer and sensors	DM-, DRC- and DSE-series

Features

- Designed for long wearing comfort and to protect the user against most ultraviolet light sources

- Improves contrast between the fluorescent area and the background by eliminating the "blue haze" interference

- **UVS-30 spectacles**, generally recommended for sporadic, lower intensity UV sources fit easily over eyeglasses

- **UVG-50 goggles** and **UVF-80 face shield**, for maximum protection from extended or high intensity UV exposure, adjusts to fit the face

- Goggles and face shield meet ANSI specifications and OSHA standards

Background

Ultraviolet light is a natural part of our environment, most commonly found in sunlight. It is an invisible band of electromagnetic radiation just beyond the violet end of the visible spectrum. This band is generally divided into short, medium and long wavelength regions that differ in their effects on the human body.

The short wavelength region, also known as far ultraviolet, germicidal or UV-C, extends from 180 to 280nm. Although it has little penetrating power, short wave can cause severe burns to the eyes and skin. The usual artificial sources of this radiation are low pressure, mercury vapor lamps and certain other metal vapor lamps used in UV sterilization, chromatography, mineralogy, EPROM erasing, photochemical reaction, etc.

The medium wavelength region, also known as middle ultraviolet, erythermal or UV-B, extends from 280 to 320nm. It has high penetrating power and can seriously burn the eyes and skin. The usual artificial sources of this radiation are "sun lamps" used for cosmetic or therapeutic purposes and vitamin production.

The long wavelength region, also known as near ultraviolet, black light, Wood's light or UV-A, extends from 320 to 400nm. Some people are overly sensitive to radiation in this region and may experience "blue haze" interference when viewing sources of long wave UV.

Although everyone is exposed to UV sources natural and/or artificial on a daily basis, unprotected and prolonged exposure to any form of UV light, including long wave UV, can result in cataracts and possibly cancer. Even brief exposures can be hazardous if the intensity is high enough.

THE ELECTROMAGNETIC RADIATION SPECTRUM
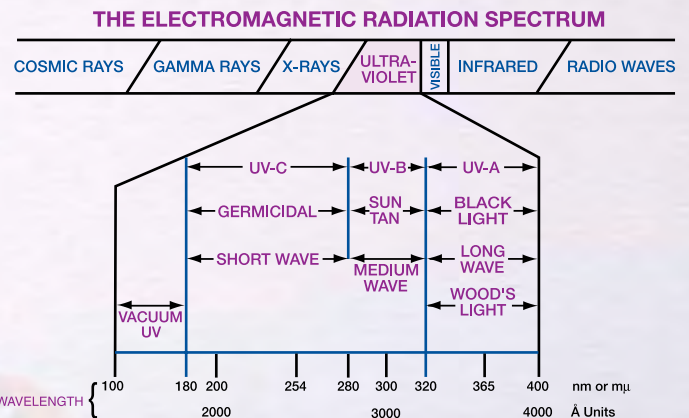
Spectroline protective eye and face wear reduces eye fatigue and irradiance at the eyes and face from most sources to levels below the maximum recommended in NIOSH document HSM 73-11009. The UVS-30 spectacles and UVG-50 goggles are well proportioned to fit easily over regular eyeglasses. Adjustable to fit all sizes, the UVF-80 face shield has a visor that can be pivoted off the face. Both the goggles and face shield meet ANSI specification Z87.1 for safety eye wear and OSHA standard 1910.133 for eye and face protection.

Warranty Information

Warranty

All equipment is warranted against defects in manufacture. Spectronics Corporation's obligation under this warranty is limited to repairing or replacing, at the option of Spectronics Corporation, any part(s) of the product which, if properly installed, used and maintained, proves upon factory examination to have been defective in materials or workmanship within 12 months from the date of delivery to the customer.

This warranty does not apply to any component which (1) is normally consumed in operation or (2) has a normal life inherently shorter than the warranty stated. For example, tubes, bulbs, filters and rechargeable batteries are warranted for 30 days. In addition, Spectronics Corporation does not warrant any instrument that has been subjected to misuse, negligence or accident, or has been repaired or altered by anyone other than Spectronics Corporation.

This warranty is in place of all other warranties of quality. There are no other warranties either oral, written, express, implied or statutory. IMPLIED WARRANTIES OF FITNESS FOR PURPOSE AND MERCHANTABILITY ARE EXCLUDED. This warranty and your remedies thereunder are solely as stated in this form. In no event shall Spectronics Corporation be liable for special, indirect, incidental or consequential damages, nor for any damages arising out of delay in shipment or production.

Product Specifications

Spectronics Corporation reserves the right to alter product specifications without notice. Spectronics is under no obligation to make similar changes in its products previously produced.

Customer Service/Technical Assistance

CUSTOMER SERVICE
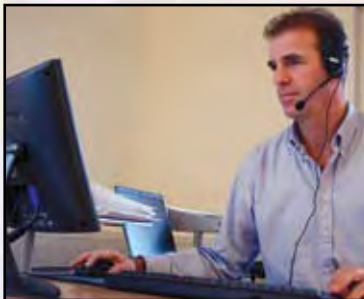
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