

Tunable Light Sources



Tunable Light Sources

Tunable light sources are used to maximize throughput in the visible region of the spectrum. They are used to study wavelength dependent chemical, biological, and physical changes or properties. The sources can also be used in color analysis and reflectivity measurements of products for aesthetic purposes.

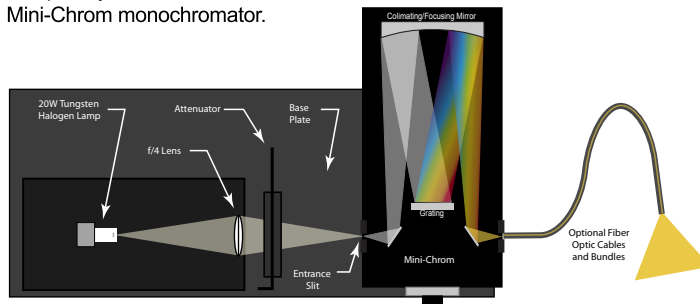
nm and others for the near infrared. (see variable wavelength fiber optic modules.)

For most illumination applications, passbands of 5 nm or narrower are considered to be high resolution. Passbands of 10 nm or less are rarely needed in colorimetry or photochemistry.



Manual TLS with optional fiber optic cable

The filament of a 20W tungsten halogen lamp is imaged so that it completely fills the entrance slit of a Mini-Chrom monochromator.

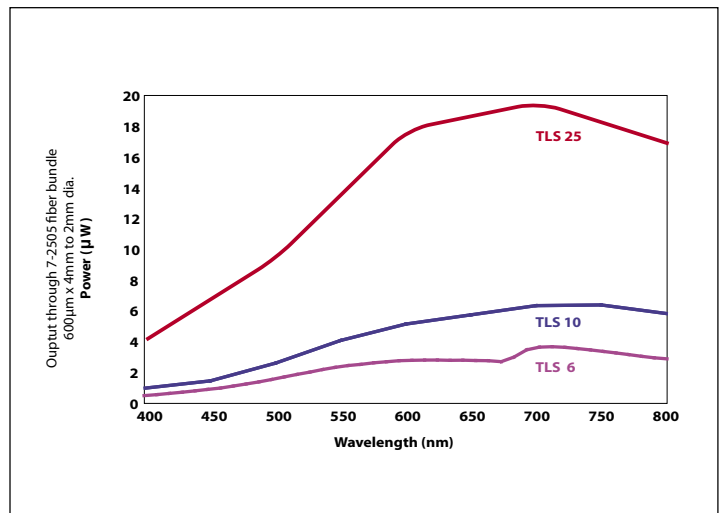


Optometrics offers three models; the TLS-6 with a 6 nm band pass, the TLS-10 with a 10 nm band pass and the TLS-25 with a 25 nm band pass when used with the standard 600 micron entrance slit and the optional 7-2505 or 7-2506 fiber optic cable. Power increases with band pass. Typically users will trade band pass for throughput, i.e. use the widest band pass possible that will not affect the quality of the measurement.

Surprisingly, as higher power lamps have larger filaments, most of the extra energy never makes it through the entrance slit and lamps with significantly higher wattage will not produce significantly higher throughput.

By turning the knob on the manual version, or using software control on the motorized version, the grating is rotated to allow only a few nm of light to pass through the fiber optic adapter or cable. Optometrics offers a wide range of grating choices for its tunable light sources to provide optimum band pass selectivity and throughput.

The lamp used in the TLS series has usable spectral energy between 360 nm and 2000 nm. However, no one grating can give adequate performance over this range. Optometrics offers versions optimized for the visible spectrum 360 nm to 800



Typical power output using the 7-2505 fiber bundle and a 600 µ entrance slit. The power and band pass will increase or decrease proportionally to the change in effective entrance and exit port apertures.

Tunable Light Sources

Models and Versions

The three models of the Tunable Light Source, TLS-6, TLS-10, and TLS-25 are available in manual and computer controlled versions.

Manual Versions Include:

- Digital monochromator with 600 μ slit set
- Lamp module including variable aperture/shutter and power supply
- Aperture adapter SMA-905
- User manual

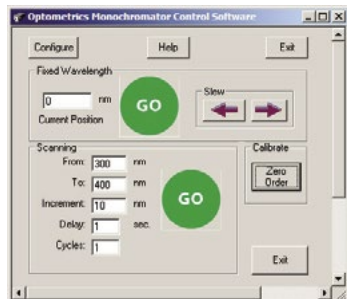
(Note: Manual versions cannot be upgraded to computer-controlled versions)

Computer Controlled Versions Include:

- Scanning digital monochromator with 600 μ slit set
- Lamp module including variable aperture/shutter
- Aperture adapter SMA-905
- User manual
- Control box (stepper motor controller and lamp power supply) with:
 - Power cord
 - Monochromator control cable
 - Lamp power cable
- Software CD

Wavelength Control Software

The computer controlled TLS models come with a simple wavelength selection software that runs under Windows® operating systems. It allows specific wavelength selection as well as the ability to scan over a spectral range with selectable wavelength increments.



Model	Band pass (nm)	Spectral range (nm)	Grating	P/N 110V	P/N 220V
Manual Versions					
TLS-6 M	6	360 to 800	1200 g/mm	9-8000	9-8001
TLS-10 M	10	360 to 800	900 g/mm	9-8010	9-8011
TLS-25 M	25	360 to 1000	300 g/mm	9-8020	9-8021
Computer Controlled Versions					
TLS-6 C	6	360 to 800	1200 g/mm	9-8100	9-8101
TLS-10 C	10	360 to 800	900 g/mm	9-8110	9-8111
TLS-25 C	25	360 to 1000	300 g/mm	9-8120	9-8121



Computer controlled TLS with optional fiber optic cable

The software is written to communicate via a USB 2.0 interface. Serial RS-232 communication is optionally available.

Optometrics Fiber Optic Cable

Optometrics has custom made fiber optic cables that are 600 microns x 4 mm on one end and either a 4.8 mm ferrule or SMA-905 connector on the other end. They are the ideal output cables for the TLS series light sources.

They have a length of 5 feet and are made with glass fibers which transmit all of the wavelengths from the TLS monochromators.



- 7-2505 Fiber Optic Cable with ferrule
- 7-2506 Fiber Optic Cable with SMA connector

Specifications

Monochromators

- f/#3.9
- Focal length74 mm
- Grating size20 mm x 20 mm
- Entrance slit600 microns x 4 mm
- Exit slit600 microns x 4 mm
- SMA-905 connector included
- Wavelength Accuracy +/- 0.2%
- Counter readability
 - TLS-6 and TLS-100.2 nm
 - TLS-250.8 nm
- Stray light rejection 10⁻³
- Gratings
 - TLS-61200 g/mm 400 nm blaze
 - TLS-10900 g/mm 500 nm blaze
 - TLS-25300 g/mm 500 nm blaze

Lamp

- Type Tungsten Halogen
- Power12V 20W
- Color Temperature32000K
- Spectral range360 nm to 2000 nm
- Power supply12 VDC 2A

Dimensions

Light source (on base plate)

- L H W 20.5 cm X 6.0 cm X 20.5 cm
- Weight 1.4 Kg

Control box for computerized models

- L H W 25.3 cm X 13.7 cm X 20.5 cm
- Weight 1.7 Kg

© Windows is a registered trademark of Microsoft.

Your Choice for Wavelength Selection Solutions

- **Gratings**

Originals and Replicated; Ruled and Holographic; Grazing Incidence, Echelles, Telecom and Transmission Gratings

- **Beamsplitters**

Reflecting/Transmitting Beamsplitters, Transmission Grating Beamsplitters, Beam Dividers/Combiners

- **Optical Components**

Mirrors, Lenses, Windows, Flats, Beamsplitters, Prisms

- **Filters**



Hard and Soft Coated, Near Ultraviolet, Visible, Near Infrared and Laser Line Filters

- **Infrared Optics & Laser Products**

Laser Gratings, Holographic and Ruled Wire Grid Polarizers

- **Monochromators**

Mini-Chrom Monochromators

- **Systems & Accessories**

Variable Wavelength Fiber Optic Modules, Sample Compartments, Detector, Light Source, Stepping Motor Controller, Tunable Light Sources

- **SPF-290S Analyzer**

Spectrophotometer for determining SPF Values

**Plus specialized packaging, bar coding
and Kanban stocking arrangements for OEM customers.**

Rev. Date: 10/09