

# TUNABLE LASER SYSTEMS



- One box PLUG&PLAY Tunable Laser Systems
- Easy, Effective and Reliable applications
- Fully Customizable to meet all your requirements

## Tunable Laser System (TLS)

*Fully tunable pico-second pulsed laser system by Spectrolight*

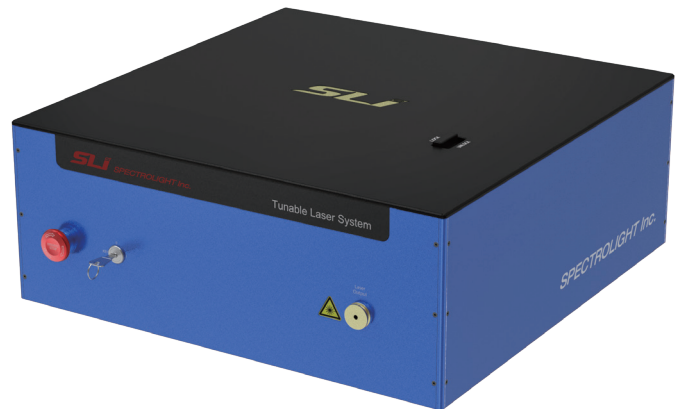
Spectrolight's tunable laser system (TLS) is an innovative, continuously tunable laser that combines a supercontinuum laser and a tunable bandpass filter in VISBLE, IR, and SWIR ranges.

**TLS-RED** can generate wide wavelength ranges of approximately 400 nm to 1700 nm and can control the FWHM 2 to 15 nm (nominal), and **TLS-BLUE** has the same wide wavelength ranges with fixed FWHM at 10 or 20 nm. TLS-RED is suitable for fields that require precise scanning, and TLS-BLUE is ideal for fields that require high output. By using Spectrolight's TLS, users can freely select the output power and wavelength ranges according to their needs.

TLS is a picosecond tunable laser that can be applied to various fields, from fluorescence microscopy to time-resolved spectroscopy, such as TCSPC, Hyperspectral imaging, Machine vision, Semiconductors, Sensors, and other applications. .

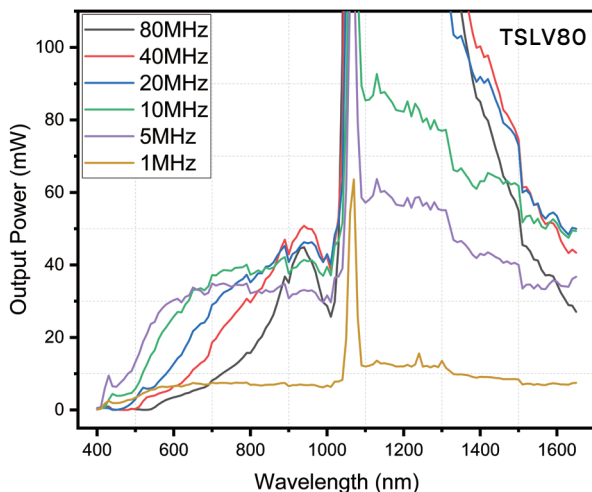


**TLS-RED** (Tunable bandwidth)

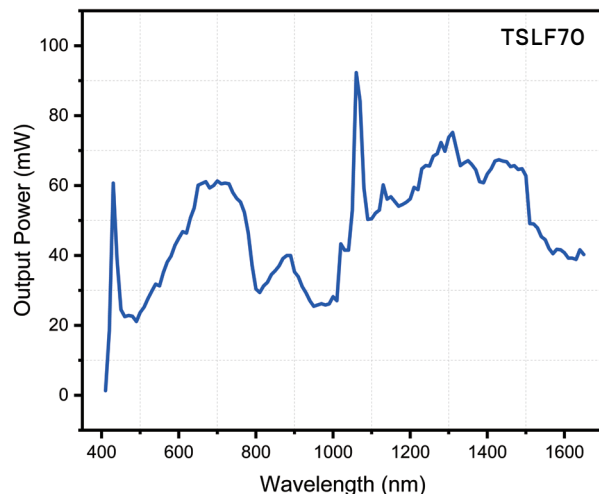


**TLS-BLUE** (Fixed bandwidth)

### Output power of TLS



\* Measured at 15 nm bandwidth (FWHM)



## TLS-RED

Each TLS-Red model can cover different spectral ranges from 410 to 1700 nm. The FWHM bandwidth of TLS-Red is tunable from 2nm to 15nm (nominal). The exact tunable bandwidth depends on the wavelength range. Users can select laser types and variable wavelength ranges according to the user's applications. Please refer to the detailed specifications table below.

### General Specifications

*Tunable Laser System (TLS-RED) : Each TLS has VIS, IR, SWIR and Custom wavelength selection*

Model	Supercontinuum output power		Repetition Rate	Fundamental pulse width (ps)	Output pulse width (ps)	Tuning Range (nm)	Bandwidth (FWHM) (nm)
	Visible	Total					
TSLF10-RED	100 mW	1 W	5 MHz	~ 100 ps	< 300 ps	450 - 1700 nm	2 - 15 nm (nominal)
TSLF15-RED	500 mW	1.5 W	20 MHz	~ 6 ps	< 50 ps	410 - 1700 nm	
TSLV80-RED	1 W	8 W	0.01 to 200 MHz	~ 100 ps	< 300 ps	430 - 1700 nm	
TSLF70-RED	2 W	7 W	80 MHz	~ 6 ps	< 50 ps	410 - 1700 nm	

### Detailed Specifications

Item	Laser Specifications	Optical Specifications
TSLF10-RED-VIS	Wavelength : 450 - 2400 nm Output power : 1 W VIS power : 0.1 W Repetition rate : 5 MHz	Tunable CWL : 450 - 790 nm FWHM : 2 - 15 nm (450 - 700 nm), 3 - 15 nm (701 - 790 nm)
TSLF10-RED-IR		Tunable CWL : 775 - 1150 nm FWHM : 3 - 15 nm (775 - 890 nm), 5 - 15 nm (891 - 1150 nm)
TSLF10-RED-SWIR		Tunable CWL : 1140 - 1700 nm FWHM : 5 - 15 nm (1140 - 1500 nm), 7 - 13 nm (1501 - 1700 nm)
TSLF15-RED-VIS	Wavelength : 410 - 2400 nm Output power : 1.5 W VIS power : 0.5 W Repetition rate : 20 MHz	Tunable CWL : 410 - 790 nm FWHM : 2 - 15 nm (410 - 700 nm), 3 - 15 nm (701 - 790 nm)
TSLF15-RED-IR		Tunable CWL : 775 - 1150 nm FWHM : 3 - 15 nm (775 - 890 nm), 5 - 15 nm (891 - 1150 nm)
TSLF15-RED-SWIR		Tunable CWL : 1140 - 1700 nm FWHM : 5 - 15 nm (1140 - 1500 nm), 7 - 13 nm (1501 - 1700 nm)
TSLV80-RED-VIS	Wavelength : 430 - 2400 nm Output power : 8 W VIS power : 1 W Repetition rate : 0.01 - 200 MHz adjustable	Tunable CWL : 430 - 790 nm FWHM : 2 - 15 nm (430 - 700 nm), 3 - 15 nm (701 - 790 nm)
TSLV80-RED-IR		Tunable CWL : 775 - 1150 nm FWHM : 3 - 15 nm (775 - 890 nm), 5 - 15 nm (891 - 1150 nm)
TSLV80-RED-SWIR		Tunable CWL : 1140 - 1700 nm FWHM : 5 - 15 nm (1140 - 1500 nm), 7 - 13 nm (1501 - 1700 nm)
TSLF70-RED-VIS	Wavelength : 410 - 2400 nm Output power : 7 W VIS power : 2 W Repetition rate : 80 MHz	Tunable CWL : 410 - 790 nm FWHM : 2 - 15 nm (410 - 700 nm), 3 - 15 nm (701 - 790 nm)
TSLF70-RED-IR		Tunable CWL : 775 - 1150 nm FWHM : 3 - 15 nm (775 - 890 nm), 5 - 15 nm (891 - 1150 nm)
TSLF70-RED-SWIR		Tunable CWL : 1140 - 1700 nm FWHM : 5 - 15 nm (1140 - 1500 nm), 7 - 13 nm (1501 - 1700 nm)

For the Custom models, users can select a supercontinuum laser model and variable wavelength ranges according to the user's applications. Please refer to the table below for supercontinuum laser models and wavelength ranges. For example, if the user selects the supercontinuum laser model as SLF10 and the wavelength range of 690 – 1310 nm, then the model name of the TLS will be TSLF10-RED-Custom (690 -1310 nm).

## The supercontinuum laser model table

### *SL-Pico: Supercontinuum laser*

Model	Supercontinuum output power		Repetition Rate	Fundamental pulse width (ps)	Output pulse width (ps)	Spectral Range (nm)
	Visible	Total				
SLF10	100 mW	1 W	5 MHz	~ 100 ps	< 300 ps	450 - 2400 nm
SLF15	500 mW	1.5 W	20 MHz	~ 6 ps	< 50 ps	410 - 2400 nm
SLV80	1 W	8 W	0.01 to 200 MHz	~ 100 ps	< 300 ps	430 - 2400 nm
SLF70	2 W	7 W	80 MHz	~ 6 ps	< 50 ps	410 - 2400 nm

## Wavelength range table

*User specified custom wavelength range selectable from 410 - 1700 nm (nominal)*

FWHM	2-15					3-15		5-15				7-13
CWL	410 - 435	430 - 490	485 - 550	545 - 620	615 - 700	690 - 790	775 - 890	880 - 1015	1000 - 1150	1140 - 1310	1300 - 1500	1475 - 1700



**TLS-RED** (Tunable bandwidth)

## TLS-BLUE

Each TLS-Red model can cover different spectral ranges from 410 to 1700 nm. The FWHM bandwidth of TLS-Blue is fixed at either 10 or 20 nm (nominal). Users can select laser types and variable wavelength ranges according to the user's applications. Please refer to the detailed specifications table below.

### General Specifications

*Tunable Laser System (TLS-BLUE): Each TLS has VIS, IR, SWIR and Custom wavelength selection*

Model	Supercontinuum output power		Repetition Rate	Fundamental pulse width (ps)	Output pulse width (ps)	Tuning Range (nm)	Bandwidth (FWHM) (nm)
	Visible	Total					
TSLF10-BLUE	100 mW	1 W	5 MHz	~ 100 ps	< 300 ps	450 - 1700 nm	Fixed 10 or 20 nm (nominal)
TSLF15-BLUE	500 mW	1.5 W	20 MHz	~ 6 ps	< 50 ps	410 - 1700 nm	
TSLV80-BLUE	1 W	8 W	0.01 to 200 MHz	~ 100 ps	< 300 ps	430 - 1700 nm	
TSLF70-BLUE	2 W	7 W	80 MHz	~ 6 ps	< 50 ps	410 - 1700 nm	

### Detailed Specifications

Item	Laser Specifications	Optical Specifications
TSLF10-BLUE-VIS	Wavelength : 450 - 2400 nm Output power : 1 W VIS power : 0.1 W Repetition rate : 5 MHz	Tunable CWL : 450 - 790 nm Fixed FWHM : 10 or 20 nm (nominal)
TSLF10-BLUE-IR		Tunable CWL : 775 - 1150 nm Fixed FWHM : 10 or 20 nm (nominal)
TSLF10-BLUE-SWIR		Tunable CWL : 1140 - 1700 nm Fixed FWHM : 10 or 20 nm (nominal)
TSLF15-BLUE-VIS	Wavelength : 410 - 2400 nm Output power : 1.5 W VIS power : 0.5 W Repetition rate : 20 MHz	Tunable CWL : 410 - 790 nm Fixed FWHM : 10 or 20 nm (nominal)
TSLF15-BLUE-IR		Tunable CWL : 775 - 1150 nm Fixed FWHM : 10 or 20 nm (nominal)
TSLF15-BLUE-SWIR		Tunable CWL : 1140 - 1700 nm Fixed FWHM : 10 or 20 nm (nominal)
TSLV80-BLUE-VIS	Wavelength : 430 - 2400 nm Output power : 8 W VIS power : 1 W Repetition rate : 0.01 - 200 MHz adjustable	Tunable CWL : 430 - 790 nm Fixed FWHM : 10 or 20 nm (nominal)
TSLV80-BLUE-IR		Tunable CWL : 775 - 1150 nm Fixed FWHM : 10 or 20 nm (nominal)
TSLV80-BLUE-SWIR		Tunable CWL : 1140 - 1700 nm Fixed FWHM : 10 or 20 nm (nominal)
TSLF70-BLUE-VIS	Wavelength : 410 - 2400 nm Output power : 7 W VIS power : 2 W Repetition rate : 80 MHz	Tunable CWL : 410 - 790 nm Fixed FWHM : 10 or 20 nm (nominal)
TSLF70-BLUE-IR		Tunable CWL : 775 - 1150 nm Fixed FWHM : 10 or 20 nm (nominal)
TSLF70-BLUE-SWIR		Tunable CWL : 1140 - 1700 nm Fixed FWHM : 10 or 20 nm (nominal)

For the Custom models, users can select a supercontinuum laser model and variable wavelength ranges according to the user's applications. Please refer to the table below for supercontinuum laser models and wavelength ranges. For example, if the user selects the supercontinuum laser model as SLF10 and the wavelength range of 690 – 1310 nm, then the model name of the TLS will be TSLF10-BLUE-Custom (690 -1310 nm).

## The supercontinuum laser model table

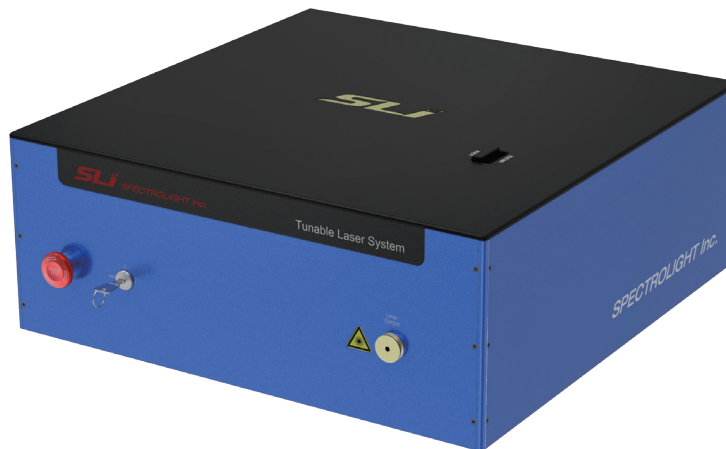
### SL-Pico: Supercontinuum laser

Model	Supercontinuum output power		Repetition Rate	Fundamental pulse width (ps)	Output pulse width (ps)	Spectral Range (nm)
	Visible	Total				
SLF10	100 mW	1 W	5 MHz	~ 100 ps	< 300 ps	450 - 2400 nm
SLF15	500 mW	1.5 W	20 MHz	~ 6 ps	< 50 ps	410 - 2400 nm
SLV80	1 W	8 W	0.01 to 200 MHz	~ 100 ps	< 300 ps	430 - 2400 nm
SLF70	2 W	7 W	80 MHz	~ 6 ps	< 50 ps	410 - 2400 nm

## Wavelength range table

User specified custom wavelength range selectable from 410 - 1700 nm (nominal)

FWHM	Fixed 10 or 20 (nominal)											
CWL	410 - 435	430 - 490	485 - 550	545 - 620	615 - 700	690 - 790	775 - 890	880 - 1015	1000 - 1150	1140 - 1310	1300 - 1500	1475 - 1700



**TLS-BLUE** (Fixed bandwidth)

## Full Specifications

		TSLF10-RED	TSLF15-RED	TSLF70-RED	TSLV80-RED	TSLF10-BLUE	TSLF15-BLUE	TSLF70-BLUE	TSLV80-BLUE
Output power	Visible	100 mW	500 mW	2 W	1 W	100 mW	500 mW	2 W	1 W
	Total	1 W	1.5 W	7 W	8 W	1 W	1.5 W	7 W	8 W
Repetition Rate		5 MHz	20 MHz	80 MHz	0.01 to 200 MHz adjustable	5 MHz	20 MHz	80 MHz	0.01 to 200 MHz adjustable
Fundamental pulse width		~ 100 ps	~ 6 ps	~ 6 ps	~ 100 ps	~ 100 ps	~ 6 ps	~ 6 ps	~ 100 ps
Output pulse width		< 300 ps	< 50 ps	< 50 ps	< 300 ps	< 300 ps	< 50 ps	< 50 ps	< 300 ps
Tuning Range		450-1700 nm	410-1700 nm	410-1700 nm	430-1700 nm	450-1700 nm	410-1700 nm	410-1700 nm	430-1700 nm
FWHM Range		2-15 nm (nominal)				Fixed 10 or 20 nm			
Power stability		< 1 %							
Sync(trigger) Output		(Optional) NIM Output 0 - (-1) V or TTL Output 0 - 3.3 V							
Beam diameter and quality		~ 2 mm@633 nm; M2<1.1							
Beam divergence (Half angle)		< 1 mrad							
State of polarization		Unpolarized							
Length of output fiber		1.5 m							
Software		TLS ver.2							
Dimension (L x W x H, mm)		584.3 x 583.6 x 246							
Input power		AC 100 - 240 V, 50/60 Hz							
Data interface		USB 2.0							