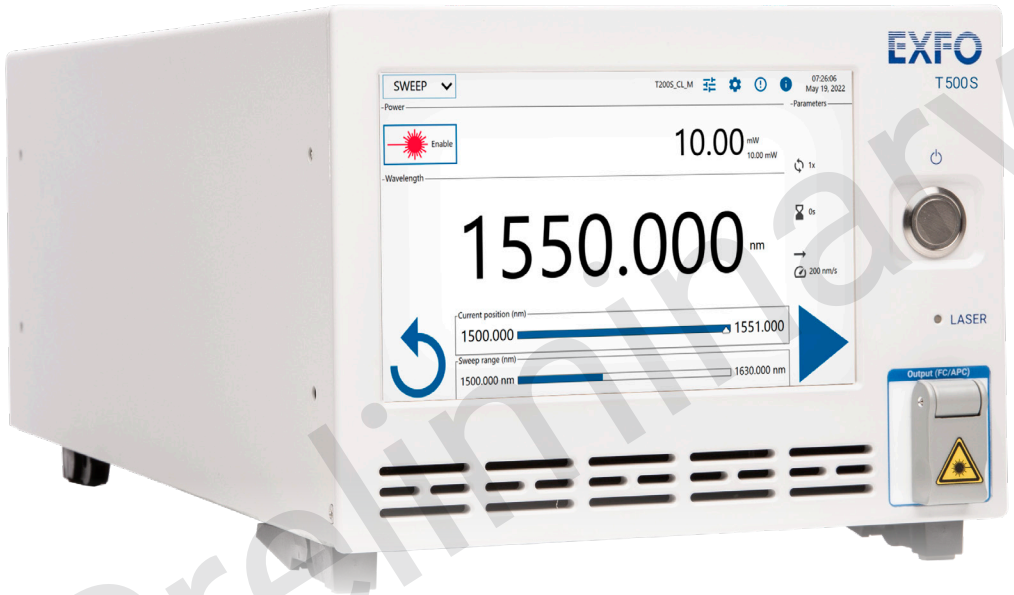
SPEC SHEET **NEW**

T500S

HIGH-POWER CONTINUOUSLY TUNABLE LASER

- Bidirectional high sweep-speed tunable laser, designed for advanced R&D applications and for testing photonic integrated circuits and optical components.



KEY FEATURES

- Bidirectional 200 nm/s scanning speed
- 10-dBm optical power output across the range
- Ultra-low spontaneous emission and narrow linewidth
- Wavelength coverage: 1240 - 1680 nm with three lasers
- Compact form factor
- Wavelength tuning and continuous sweep modes
- Active mode-hop-free operation

APPLICATIONS

- Optical components: high-speed spectral characterization
- Photonic integrated circuits: wafer-level or die-level testing
- Multipurpose tunable laser for R&D

RELATED PRODUCTS AND ACCESSORIES

CTP10
component tester

CT440
component tester

T200S
high-power continuously tunable laser

DESIGNED FOR ADVANCED OPTICAL SPECTRAL CHARACTERIZATION

An essential instrument in R&D labs and on production floors, a continuously tunable laser covers various applications whenever rapid, continuous wavelength tuning is required.

The T500S laser delivers speed and high power while sweeping in addition to narrow linewidth at fixed wavelengths.

Testing high-speed photonic integrated circuits (PICs)

Integrated photonics can include complex optical components with high-contrast spectrum. For instance, a ring resonator may have very sharp features making it difficult to characterize insertion loss.

To test such devices, the T500S laser can be jointly operated with the CTP10, EXFO's component testing platform. With high-resolution and high-accuracy spectral measurement, the CTP10 is an integrated solution that leverages the bidirectional and high-speed wavelength sweeps of the T500S. The T500S is also compatible with the CT440, EXFO's compact component tester operating at 100 nm/s.

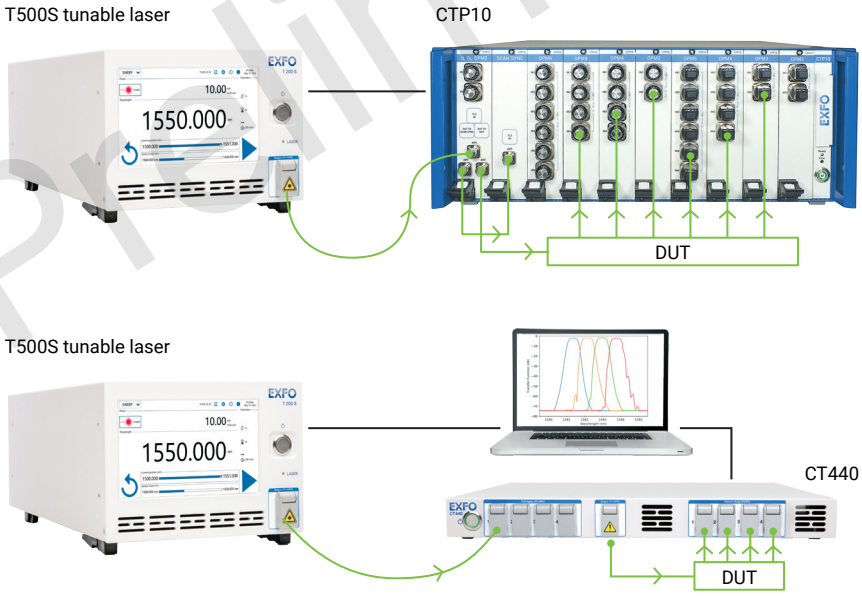
Optical component testing

The T500S builds on previous innovations for tunable lasers such as ultra-low signal-to-source spontaneous emission ratio (SSSER), high-power cavity and mode-hop-free operation. These three parameters are key for high-quality optical component testing, either at specific fixed wavelengths or through a swept wavelength scan.

Optical components generally have a strong dependence on the wavelength or polarization of light, leading to sensitivity regarding polarization-dependent loss (PDL). When operated with the CTP10, the T500S delivers highly accurate and fast PDL measurements thanks to its bidirectional scanning feature.

In labs or on production floors, the test instrument can be easily operated using the large touchscreen with an ergonomic graphical user interface and it can be fully automated using SCPI commands from the Ethernet port at the back of the unit.

For more details, please refer to the CTP10 or CT440 specification sheets.



Scientific R&D

In R&D environments, continuously tunable lasers are often used in swept wavelength applications in any scanning direction but they can also be required to tune to a particular stable wavelength with narrow linewidth.

The T500S has a dedicated tuning mode that optimizes linewidth, and an adjustable optical output when high optical power is required.

INDUSTRY-LEADING FEATURES

Up to 14 dBm output power with high spectral purity

The T500S exhibits a crystal-clear optical spectrum over the entire tuning range. Indeed, the optical cavity eliminates broadband source spontaneous emission (SSE) without any compromise on optical power and can be set to an optimized linewidth < 50 kHz.

High spectral purity is maintained throughout the laser sweep thanks to the active mode-hop control, ensuring reliable wavelength sweeps are achieved over and over again.

The optical output of the laser can be adjusted from 10 dBm to maximum available power. Across specific wavelength range of the laser, this can reach 13 dBm.

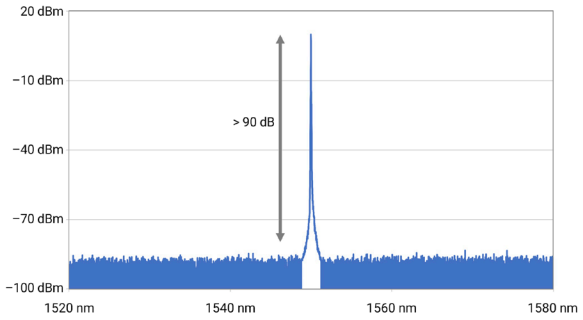


Figure 1. High power and high dynamic range.

High-speed tunability

The T500S can be configured with a bidirectional 200 nm/s scanning speed. Where speed is critical, the T500S proves an essential addition to ensure repeatable yet fast measurements. Otherwise, the laser can be set to slower scanning speeds (e.g., for legacy detection systems).

Wavelength tuning or continuously swept wavelength scans

The T500S has two user modes: TUNE or SWEEP. Each is optimized for specific usage. TUNE mode optimizes the laser control to ensure narrow linewidth at any wavelength or provide a rapid "go-to" wavelength tuning. SWEEP mode performs high-speed mode-hop-free scans over the selected wavelength range of the laser.

Automation for high precision spectral measurements

The T500S is a key part of a spectral characterization system using EXFO's component testing equipment (CTP10 or CT440), resulting in a spectral measurement benefiting from a wavelength accuracy of ±20 pm and excellent wavelength repeatability of the order of 1 pm. Automation of the new laser source is taken care of by these component testing instruments with limited impact on existing automation programs.

As a stand-alone laser, Ethernet control makes it possible to remotely drive the laser from any location. Functionalities such as triggers can be easily accessed from the touchscreen.

Compact and easy-to-use

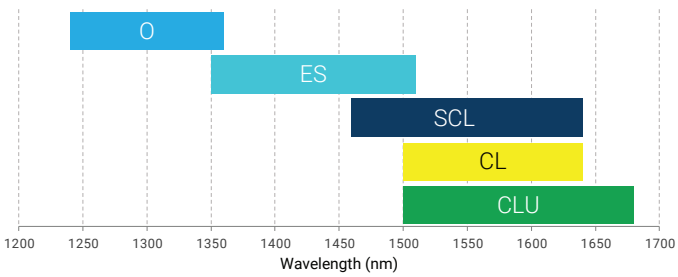
The half-rack configuration make the T500S an attractive device for lab applications, with limited footprint. The screen can be adjusted to suit dark optical lab environments and display relevant information so that you can see them from the other side of the optical bench.

A rackmount accessory is available to mount one or two lasers inside a 19-in rack bench. With control buttons located at either corners of the screen, operating the laser can be done without even looking at the screen.

Excellent wavelength coverage with EXFO's continuously tunable lasers

T500S lasers all deliver quality performance, based on high-end specifications, during wavelength scanning range, whether when tuned to a particular wavelength or when swept at full speed.

The T500S is part of EXFO's series of continuously tunable lasers including the T200S (wavelength coverage from 1240 nm to 1680 nm using three lasers). For more details about the T200S, please refer to the **T200S specification sheet**.



Wavelength coverage of T500S lasers

SPECIFICATIONS – OPTICAL CHARACTERISTICS

		T500S-O	T500S-ES	T500S-SCL	T500S-CL	T500S-CLU
Wavelength	Wavelength range (nm)	1240-1360	1350-1510	1460-1640	1500-1640	1500-1680
	Wavelength uncertainty (pm)	±20				
	Wavelength resolution setting (pm)	1				
Sweep control	Maximum speed (nm/s)	200				
	Adjustable speed (nm/s)	20, 50, 100, 200 with bidirectional scanning				
	Mode-hop-free operation	Active mode-hop cancelation				
Optical power	Maximum output power peak (dBm)[a]	> 14				
	Maximum output power full wavelength range (dBm)	> 10				
Spectral characteristics	Linewidth (10 µs integration time) (kHz)[b]	< 50				
	Linewidth (100 µs integration time) (kHz)[b]	300				
Optical output	Optical fiber type[c]	PM optical fiber, FC/APC connector				
	PER (dB)	17				

All specifications, are typical and given at temperature 21°C ± 1°C, after a 60-minute warm-up.

a. Peak power wavelength may vary from laser to laser.

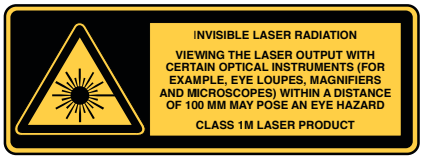
b. In TUNE mode, optimized linewidth setting.

c. Fiber's slow axis and polarization aligned with key connector.

SPECIFICATIONS – HARDWARE

		T500S (all models)
Environmental conditions	Operating temperature	18 °C to 28 °C (64.4 °F to 82.4 °F)
	Operating humidity	<80% (non-condensing)
	Warm-up time (hour)	1
Physical footprint	Size (L x H x D)	217 mm x 173 mm x 441 mm (8.54 in x 6.81 in x 17.36 in)
	Weight	9 kg (19.84 lb)
Connectivity	Monitor	7-in capacitive touchscreen
	Remote communication	Ethernet RJ45 LAN 10/100/1000 Mbit/s
	Electrical BNC ports	1x trigger IN, 1x trigger OUT, power monitoring and wavelength monitoring
	USB ports	USB 3.0 (1), USB 2.0 (2)
Security	Laser safety	Class 1M
	Power supply	100 to 240V AC/ 50 to 60 Hz / 0.65 - 0.3 A
Accessories (sold separately)	Rackmount	4U tablet accommodating 2 units

LASER SAFETY



ORDERING INFORMATION

T500S-XX-M

Wavelength range
O: 1240 nm – 1360 nm
ES: 1350 nm – 1510 nm
SCL: 1460 nm – 1640 nm
CL: 1500 nm – 1640 nm
CLU: 1500 nm – 1680 nm

Example: T500S-CL-M

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