

# Tunable Laser Source

## TLS-APBX series



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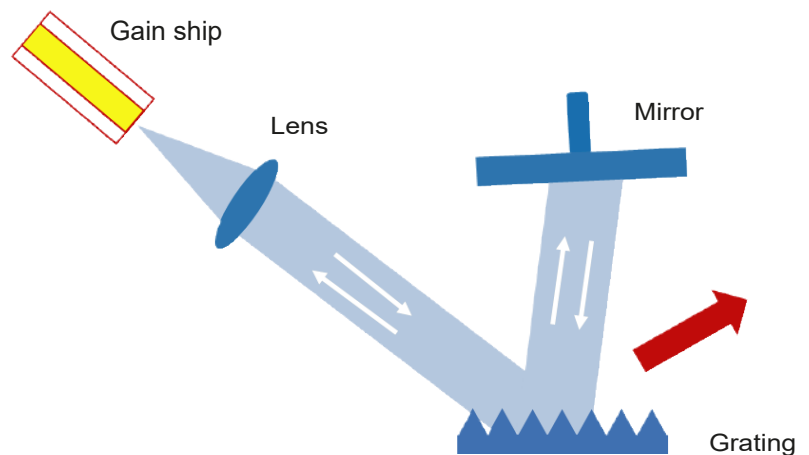
# External cavity Tunable Laser Source

## Product description

APEX Technologies TLS model is a high performance external cavity Littman/ Metcalf tunable laser source combining wide tuning range, high output power and high signal-to-noise ratio. Our laser covers the wavelength range between 1030 and 1630 nm using several TLS models with high scan speed mode-hop-free continuous sweeping and a wavelength span ranging from 30 to 110 nm depending on the wavelength range.

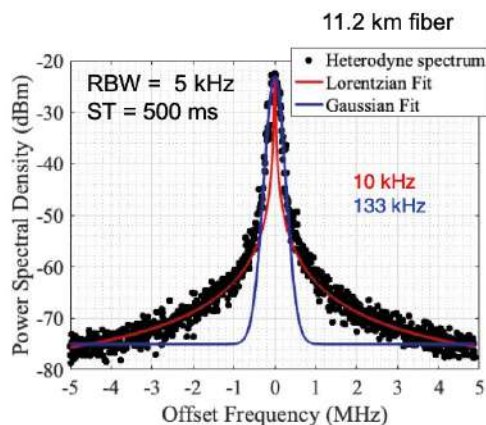
## Physical principle

Our external cavity design consists of a gain chip, a grating used as dispersion element and a mirror controlled by a motor for mode selection. The external cavity mode and the grating selected mode are synchronized by controlling the rotation of the pivot point that changes the length of the cavity and the incidence angle on the grating that changes the wavelength selectivity of the grating. This technique provide a wide tuning range mode-hop-free sweeping with a narrow linewidth and high output power.



## Wavelength characteristics

Our TLS model reach an excellent wavelength accuracy by using two internal wavelength calibrator. One part of the output power is connected to a wavelength etalon in which we have an interferometer system that allows a high relative frequency calibration. We reach also a high absolute wavelength accuracy of  $\pm 3$  pm by using the absorption spectrum of a gas cell. Our TLS provide also a narrow linewidth  $< 150$  kHz as we can see in the below measurement.



## Features

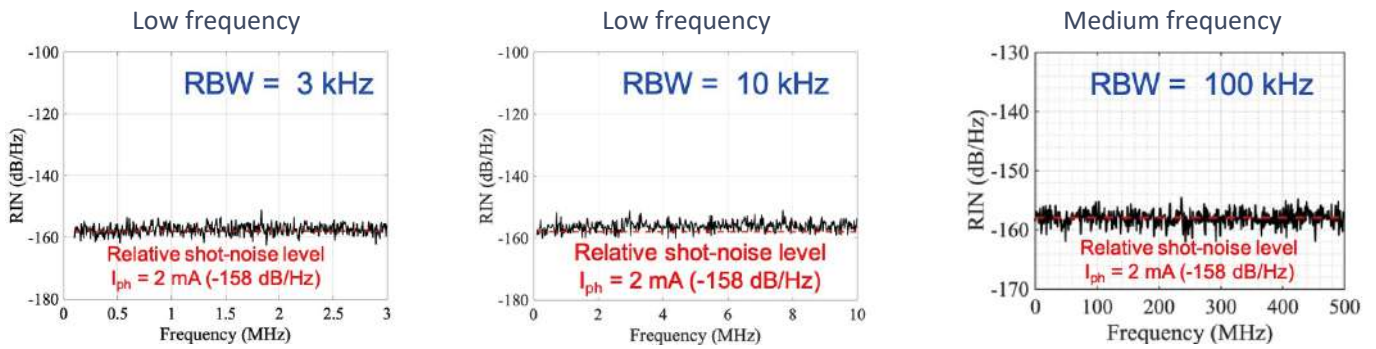
- Mode-hop-free continuous sweeping
- High output power: up to + 13 dBm
- Narrow linewidth:  $< 133$  kHz
- Fundamental linewidth  $< 10$  kHz
- Wavelength accuracy:  $\pm 2$  pm
- High SMSR:  $> 45$  dB

## Applications

- Optical measurement systems
- Coherent optical communication
- Optical component characterization
- Precision spectroscopy
- Atomic and molecular physics

## Low Noise Operation: RIN < -158 dB/Hz

Our TLS provides an excellent power level stability and a Relative Intensity Noise (RIN) limited by the shot-noise level from 100 kHz up to 500 MHz



## TLS different models

APEX Technologies offers TLS models that cover the wavelength range between 1030 to 1630 nm in a benchtop or OEM versions. The benchtop version allows to integrate 1, 2 or 4 TLS models in a single box. The output power depends on the TLS model and can go up to 13 dBm. Customized wavelength range between 730 to 2000 nm can be provided under request.

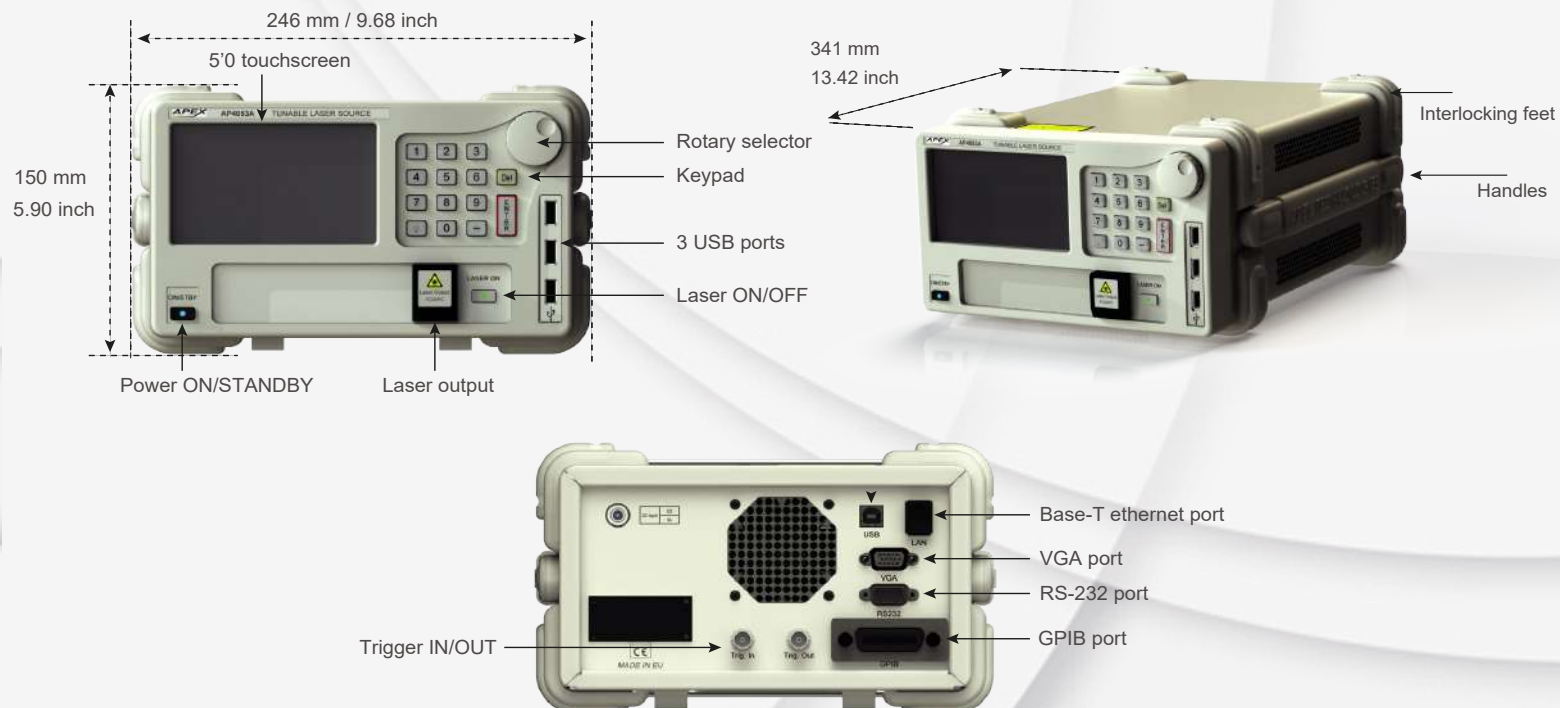
TLS-APBX/TLS-APX Models	Wavelength range (nm)	Peak outputpower (dBm)	Power max full span (dBm)	Minimum output power (dBm)
TLS-AP(B)-T	1030-1075	11	8	-10
TLS-AP(B)-O1	1265-1345	13	9	0
TLS-AP(B)-O2	1265-1355	13	9	0
TLS-AP(B)-E	1345-1450	13	8	0
TLS-AP(B)-S	1445-1525	10	8	-10
TLS-AP(B)-CL1	1525-1607	10	7	-10
TLS-AP(B)-CL2	1520-1630	10	7	-10

## APEX Technologies TLS common features

Wavelength setting resolution	3 pm
Wavelength stability	+/- 1 pm
Absolute Wavelength accuracy	+/- 2 pm (typical)
Wavelength Repeatability	+/- 2 pm (typical)
Power flatness (static/sweep mode)	0.05 dB
Sweep speed	Adjustable from 5 to 200 nm/s
Power stability @24h	+/- 0.2 dB
Power Repeatability (step mode)	+/- 0.05 dB
Dynamic Power Repeatability (Sweep mode @10 nm/s)	+/- 0.01 dBm
Dynamic Power Repeatability (Sweep mode @100 nm/s)	+/- 0.06 dBm
RIN ( $I_{ph}=2 \text{ mA}$ )	-158 dB/Hz
Lorentzian Linewidth (Fundamental)	10 kHz
Linewidth (Integration over 500 ms)	133 kHz
SMSR	45 dB/0.1 nm
Signal to total source spontaneous emission ration	50 dB/0.1 nm

## Stand-alone Tunable Laser Source Benchtop

APEX Technologies now proposes compact stand-alone benchtop optical instruments including several Tunable Laser Sources with wide and various wavelength ranges, broadband Amplified Spontaneous Emission sources with a choice of wavelength ranges and polarimeter. They come with many possibilities of remote control technologies and user-friendly interface.



### Specifications:

	Stand-alone benchtop optical instruments
Connector type	FC/APC (other connectors on demand)
USB-A connectors	3 USA-A 2.0 ports (enables keyboard, mouse and USB stick)
Ethernet (remote control)	Yes
GPIB (remote control)	Yes (optional)
RS-232	Yes
Trigger output	Send trigger each FSR (around 1 GHz)
Internal memory	64 Gbit
File format	Txt, bmp and setup file formats
Display	5.0' touchscreen pad and VGA port
Dimensions	W x H x D: 246 x 150 x 341 mm / 9.68 x 5.90 x 13.42 inch
Weight	Average: 4.5 kg / 9.92 lb
Environmental conditions	Operating temperature: +5 to + 35 °C Storage temperature: -10 to + 50 °C Humidity: 20 to 80% RH ( no condensation)
Power requirement	Furnished AC Adaptor with 12V/5A DC output, power 60W

**APEX**  
TECHNOLOGIES

Distribution in the UK & Ireland



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