

# Tunable Laser Source

TLS-APBX / TLS-APX Model



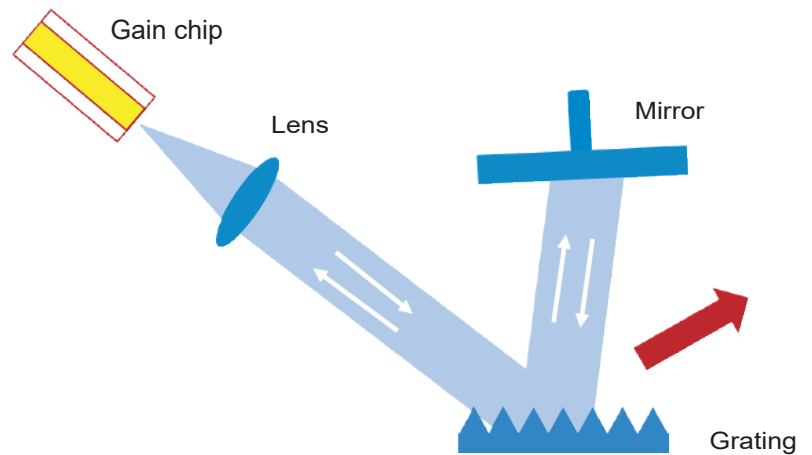
# External cavity Tunable Laser Source

## 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. It is available in two versions: a benchtop instrument, with user friendly software, a touch sensitive screen, and gpib/ethernet controls for stand alone use, and an OEM version designed for easy integration into larger systems, offering customization and requiring a user provided compatible power supply.

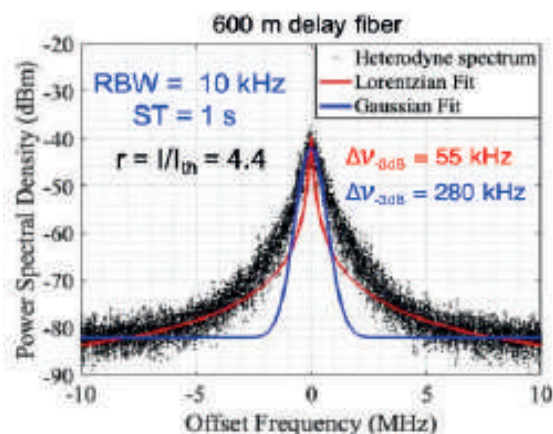
## Physical principle

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  $< 280$  kHz as we can see in the below measurement.



Benchtop version: TLS-APBX

OEM version: TLS-APX

## Features

- Mode-hop-free continuous sweeping
- High output power: up to +15 dBm
- Narrow linewidth:  $< 280$  kHz
- Fundamental linewidth  $< 55$  kHz
- Wavelength accuracy:  $\pm 3$  pm
- High SMSR:  $> 45$  dB
- Wavelength etalon trigger output

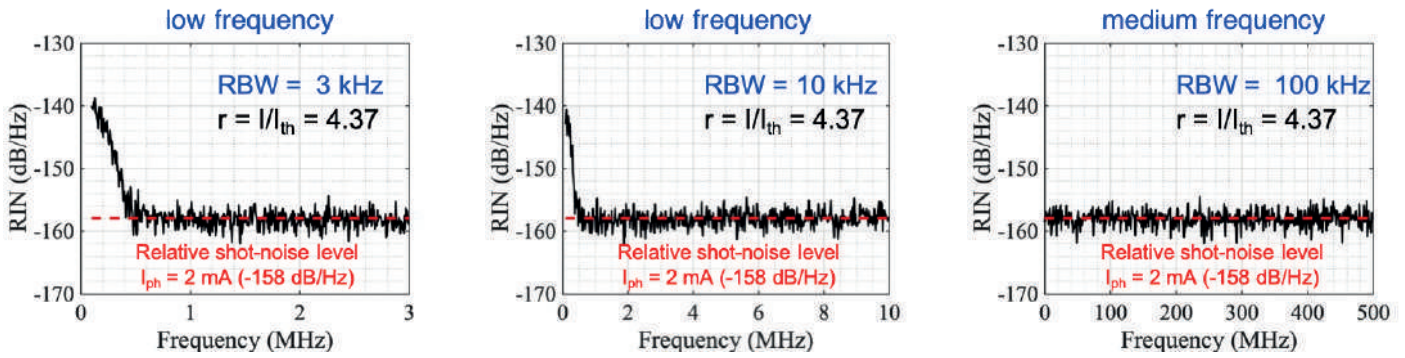
## Applications

- Optical measurement systems
- Coherent optical communication
- Optical component characterization
- Precision spectroscopy

- Atomic and molecular physics

## Low Noise Operation: RIN<-140 dB/Hz

Our TLS provide an excellent power level stability. We measured a Relative Intensity Noise better than -140 dB/Hz at low frequencies (< 500 kHz). At higher frequencies (up to 500 MHz), the laser RIN is limited by the shot noise level (-158 dB/Hz).



## 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 15 dBm. Customized wavelength range between 730 to 2000 nm can be provided under request.

TLS-APBX/TLS-APX Models	Wavelength range (nm)	Peak output power (dBm)	Power max full span (dBm)	Minimum output power (dBm)
TLS-AP(B)-T	1030-1075	11	8	0
TLS-AP(B)-O1	1265-1345	15	9	0
TLS-AP(B)-O2	1265-1355	15	9	0
TLS-AP(B)-E	1345-1450	13	8	0
TLS-AP(B)-S	1445-1525	11	8	0
TLS-AP(B)-CL1	1525-1607	10	7	0
TLS-AP(B)-CL2	1520-1630	10	7	0

## APEX Technologies TLS common features

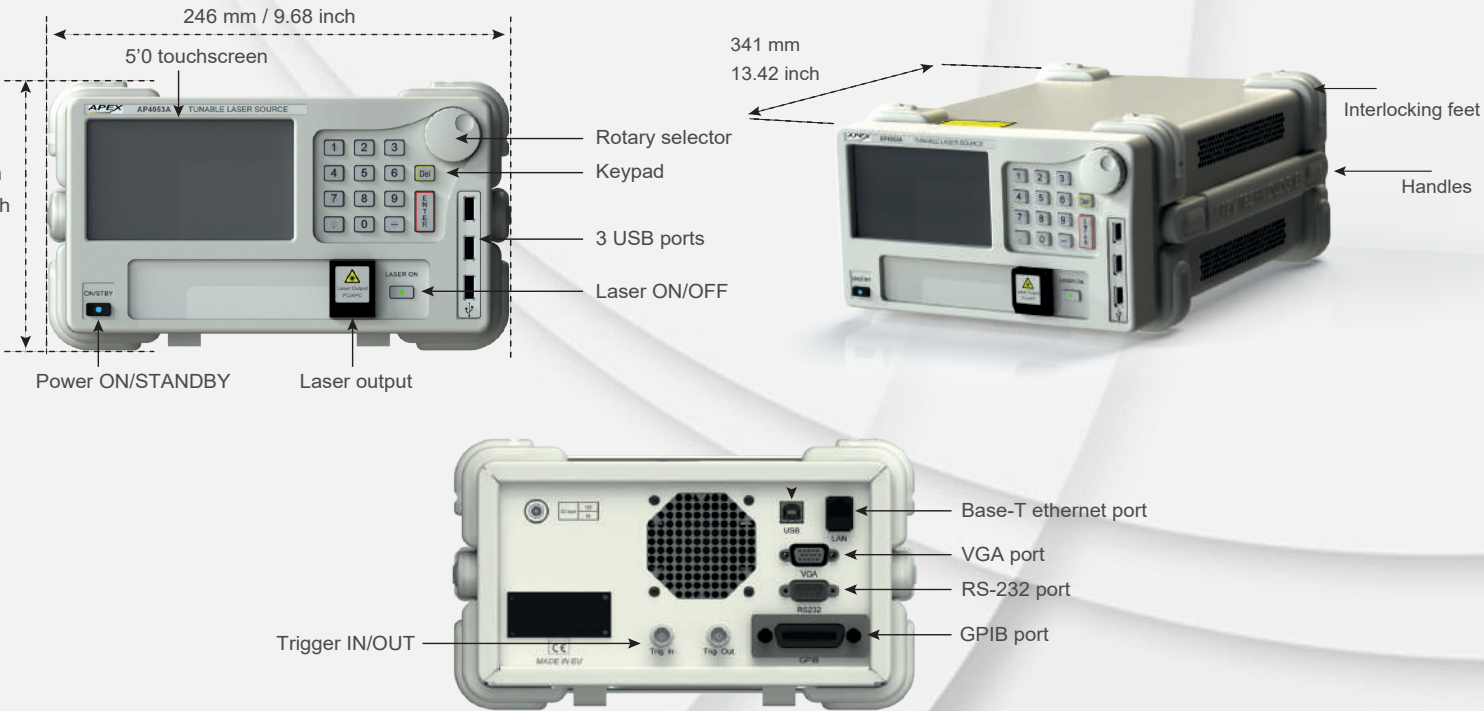
Wavelength setting resolution	3 pm
Wavelength stability	+/- 1 pm
Absolute Wavelength Accuracy*	+/- 3 pm (typical)
Wavelength Repeatability*	+/- 3 pm (typical)
Power flatness (step mode)	0.05 dB
Sweep speed**	Adjustable from 5 to 100 nm/s
Fine tuning scan range (piezo control)	3 GHz
Power stability @24h	+/- 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	-158 dB/Hz
Lorentzian Linewidth (Fundamental)	55 kHz
Linewidth (Integration over 1s)	280 kHz
SMSR	45 dB/0.1 nm
Signal to total source spontaneous emission ratio	50 dB

\*Maximum accuracy of +/- 5 pm

\*\* Maximum sweep speed of 100 nm/s for O band TLS

# 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.

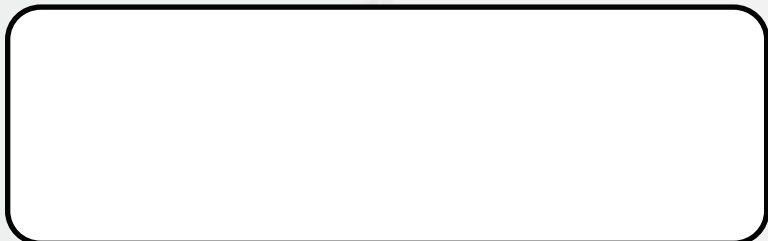


## Specifications:

	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



Your local contact



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