

Hz-Level Rack Mounted Laser System SLS-INT-1550-200-1



Obtain <1 Hz at the push of a button—less than 3×10^{-15} fractional deviation!

Our fully integrated cavity-stabilized laser system has been engineered to maximize performance and convenience in a compact footprint, combining high precision and ease of use.

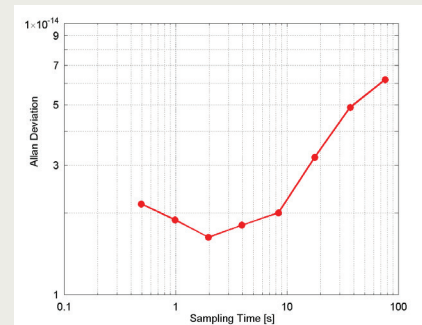
UNCOMPROMISED PERFORMANCE

Everything needed to stabilize your laser has been incorporated into a convenient **19-inch, 6U rackmount box**. This self-contained system includes a high-finesse Fabry-Perot cavity, temperature-controlled vacuum housing, vacuum pump, laser source, optics, and control electronics. Designed for portability and performance, it maintains the frequency stability for which our products are known: the frequency noise spectral density of **1 Hz/ $\sqrt{\text{Hz}}$** is ideal for applications such as microwave generation and laser radar.

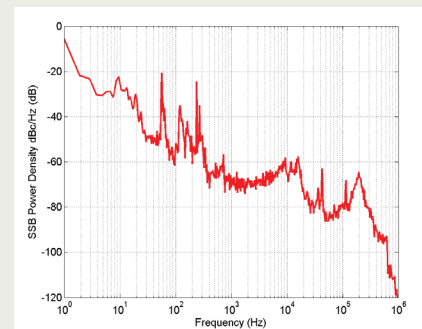
INTELLIGENT DESIGN FOR EASE OF USE

Once the laser has been tuned to be coincident with the cavity frequency, a **push-button lock function** engages the loop filter to stabilize the laser. An **intuitive, integrated touch screen** allows control of laser current, laser temperature, loop filter parameters, as well as displaying the necessary diagnostics, including cavity temperature, reflected and transmitted power from the cavity, and vacuum parameters. Analog outputs are provided for monitoring cavity power, error signal, and synchronous frequency ramp signal.

Decades of laser stabilization experience have gone into this optimally engineered system. With minimal user maintenance, our systems give you the frequency you need — guaranteed.



The Allan deviation of a Stable Laser Systems integrated frequency-stabilized laser system, as measured by heterodyning against a more stable system. Hertz-level linewidths are realized. Exact performance may differ due to natural variability in the thermal noise of mirror coatings.



The phase noise linear spectral density of the laser.

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SPECIFICATIONS

PRODUCT NOTES

- Fully integrated <1-Hz stabilized laser system in a 6U rack-mountable enclosure
- Turn-key, front panel, touchscreen locking interface or laptop GUI alternative
- System delivered aligned and under vacuum—fully operational within hours.
- Auto relock technology detects drops and quickly scans and relocks the laser

TOUCHSCREEN CONTROLS AND INDICATORS

- Laser current and temperature (set and actual)
- Cavity temperature
- Vacuum pressure
- Vacuum housing temperature
- Loop filter proportional gain and time constant

PERFORMANCE

| | |
|---|--|
| Wavelength range | Telecommunications C-band (1530 – 1565 nm) chosen at ordering. Please call us for any other wavelengths. |
| Output power | 10 mW, 80 mW |
| Cavity Free Spectral Range | 3 GHz |
| Allan Deviation 1 s no drift removal | <3e-15 |
| Allan Deviation 10 s no drift removal | <3e-14 |
| Phase noise 10 Hz offset | <-20 dBc/Hz |
| Phase noise 10 kHz offset | <-53 dBc/Hz |
| Daily laser drift | < 20 kHz for operating temperature range |
| Frequency variation after removal of linear drift | <500 Hz |
| Operating temperature range | 18-25 °C |

ANALOG OUTPUTS

- PDH error signal
- Transmitted power from the cavity
- Reflected power from the cavity
- Ramp sync signal

ELECTRONICS

| | |
|--------------------------------------|-----------------|
| Operating voltage | 110/115/230 VAC |
| Power consumption | < 25 W |
| AC Power | 50-60 Hz |
| Cooling requirements | None |
| Optional battery backup for ion pump | 3-Day Lifetime |

MECHANICAL & OPTICS

| | |
|---------------------|---|
| Output connector | FC/APC, PM-1550 |
| Dimensions | 19" rack mountable housing, 6U high (45 x 27 x 62 cm) |
| System Weight | < 40 kg |
| Vibration Isolation | Included |

OPTIONS

- Frequency tuning of locked laser +/- 400 MHz (for details or more range, please call us)
- Frequency tuning of a mode of the cavity to be within 150 MHz of an absolute frequency