Winters
Electro-Optics, Inc.

Model 100

Iodine-Stabilized He-Ne Laser

The Model 100 Iodine-Stabilized He-Ne laser is a true primary length standard based on the 1997 CIPM Mise en Pratique. It is designed for ease of use, with automatic peak identification and acquisition allowing unattended operation and use by "non-specialists." Its rugged and compact design makes it suitable for both laboratory and field applications in precision measurement, laser spectroscopy and standards work.

Features of the Model 100

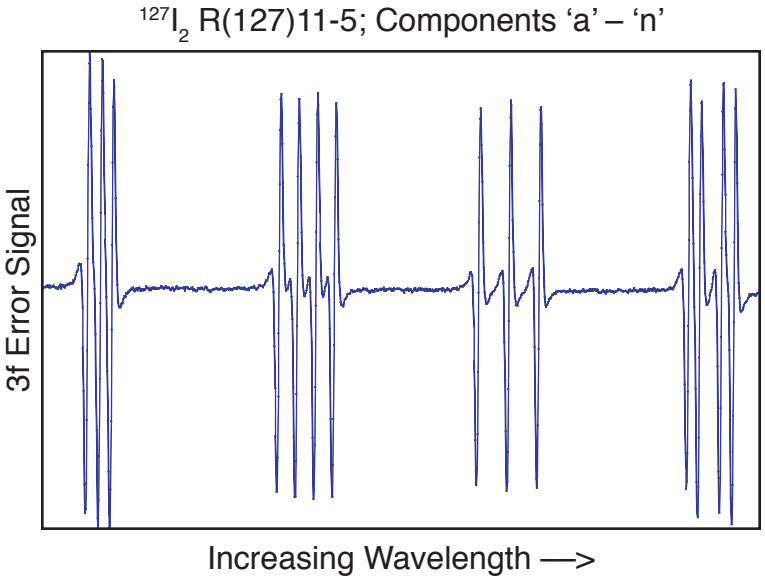
- 633 nm wavelength; 100-125 μW typical output power
- Exceptional long-term accuracy – 2.5 parts in 10^{11} absolute frequency accuracy (12 kHz)
- Meets all specifications of the 1997 CIPM Mise en Pratique
- Iodine cells manufactured and calibrated by the Bureau International des Poids et Mesures (BIPM)
- Automatic or manual operation
- Rugged, lightweight, and compact design

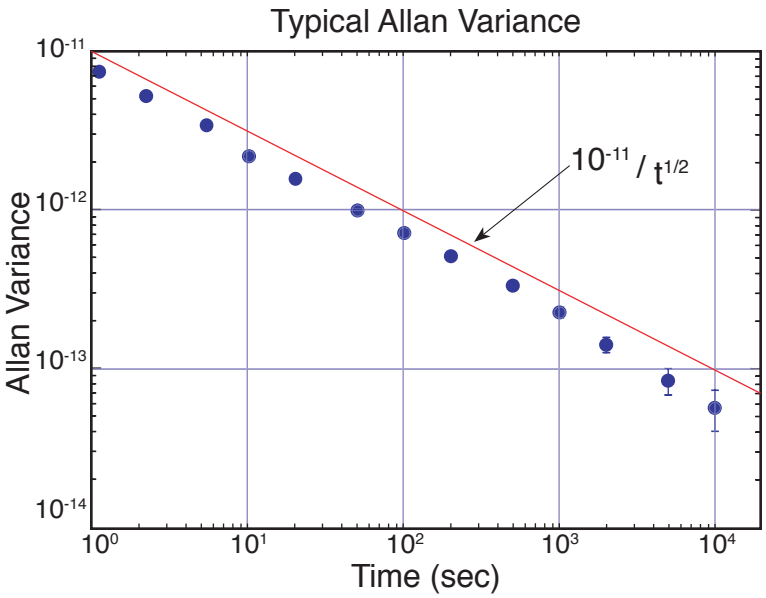
The Model 100 Iodine-Stabilized Laser is the most accurate commercially-available optical frequency / wavelength standard produced today. It was designed in cooperation with the Bureau International des Poids et Mesures (BIPM), and uses iodine cells manufactured and calibrated by the BIPM. All finished lasers are compared to an in-house reference which has been directly compared to the Cesium time standard using an optical comb generator.

The laser electronics combine traditional third harmonic detection with digital programmable logic, resulting in a user-friendly primary length standard. Automatic peak identification and acquisition on 7 of the 14 accessible iodine peaks allows unattended operation – useful in experiments where data is collected for long periods of time. Active temperature stabilization of the cavity spacer enables the laser to remain locked for extended periods of time in the presence of changing environmental conditions.

The rugged cavity design resists misalignment due to rough handling, making the laser low maintenance and easily transportable. Occasional optimization of the laser cavity alignment is simple and requires no special meters or monitors.

Front panel LEDs provide quick, comprehensive information about the status of the laser. Important signals can be monitored on two front panel meters, with some signals available at a front panel output. This eliminates the need for a dedicated CRT, but allows easy use of an external oscilloscope in demanding situations.





FREQUENCY ACCURACY:
2.5 parts in 10^{11} absolute frequency accuracy* (12 kHz)

** with respect to the frequencies set by the 1997 CIPM Mise en Pratique for the definition of the meter*

ALLAN VARIANCE:

1 x 10^{-11}	1 s
3 x 10^{-12}	10 s
1 x 10^{-12}	100 s
3 x 10^{-13}	1000 s

ACCESSIBLE HYPERFINE COMPONENTS:
Components 'd' – 'j' of R(127)11-5 transition of $^{127}I_2$
(Components 'a' – 'n' in manual mode)

OUTPUT POWER:
75 μW minimum output power on components 'd' – 'g'
100 – 125 μW typical output power

LASER CAVITY PARAMETERS:
Cavity length: 26.5 cm
Iodine cell length: 10 cm
Output beam waist: 0.40 mm (collimated)

PHYSICAL DIMENSIONS:
Electronics: 42.5 cm x 9 cm x 28 cm; 4.5 kg
(fits standard 19" rack, 2 units high)
Laser Head: 10 cm x 10 cm x 39 cm; 6.4 kg

ELECTRICAL REQUIREMENTS:
100/120/220/240 VAC; 50/60 Hz; 50 W max.

OPERATING TEMPERATURE RANGE:
15°C to 25°C

WARRANTY:
1 year on parts and labor

CDRH CLASSIFICATION:
Class II laser product

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