



The MODEL 200 Offset-Locked Iodine-Stabilized He-Ne Laser is based on the same laser cavity that forms the heart of the world's most popular primary length standard – the Model 100 Iodine-Stabilized Laser. It offers the same frequency stability and accuracy of the Model 100 with an 8x increase in output power. The Model 200 has a convenient all-in-one design and is available with an optional fiber optic output.

Features of the MODEL 200

- 633 nm wavelength; 0.8 - 1.0 mW typical output power
- Exceptional long-term accuracy – 2.5 parts in 10^{11} absolute frequency accuracy (12 kHz)
- Modulation free output
- Iodine cells manufactured and calibrated by the Bureau International des Poids et Mesures (BIPM)
- Fully automatic operation
- Compact all-in-one design
- Optional single-mode fiber optic output

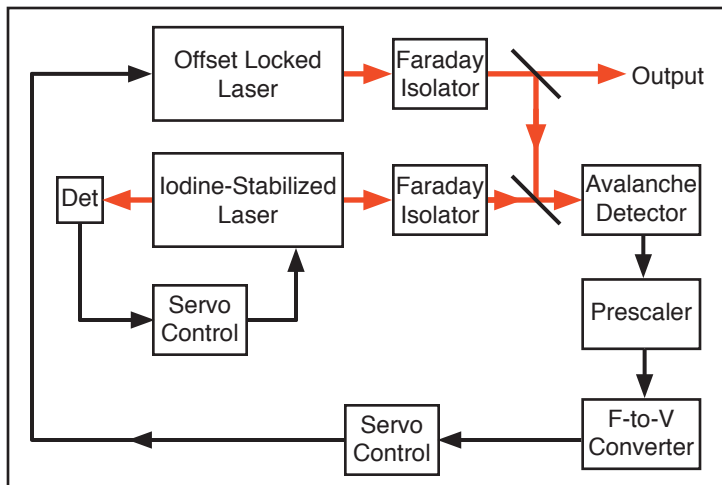
The Model 200 laser was designed to remedy the complications that arise when using an intra-cavity iodine-stabilized laser for high accuracy interferometric measurements. It boasts the same accuracy and stability as the Model 100 Iodine-Stabilized laser, but with a significant increase in output power and without the presence of frequency modulation. It accomplishes this by frequency stabilizing a second He-Ne laser to an iodine-stabilized laser cavity, effectively transferring the frequency accuracy and stability of the iodine-stabilized laser to the higher power, "offset-locked" laser. For convenience, the two laser cavities are located in a single housing, along with all the optics and electronics needed to stabilize both lasers. The result is a very compact, tightly integrated system.

At the heart of the Model 200 laser is the same iodine-stabi-

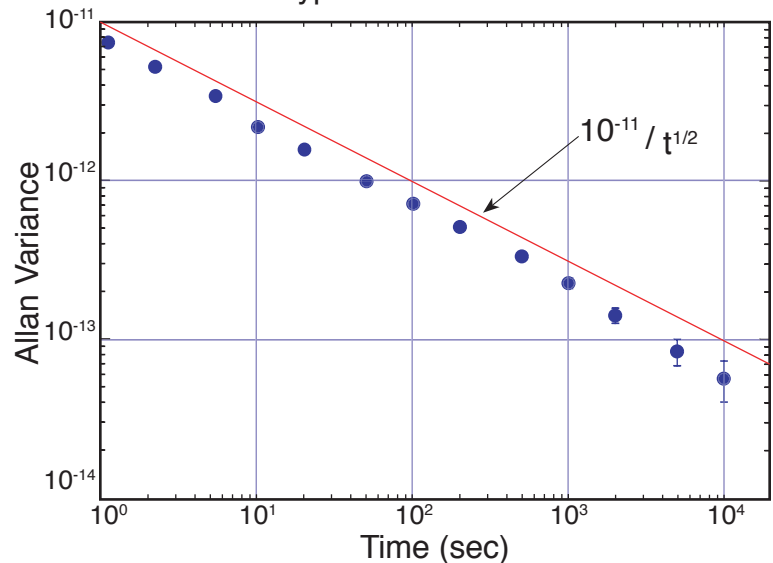
lized laser found in the Model 100 laser. Its invar cavity spacer has an inherently low coefficient of thermal expansion – giving it good long-term stability – and a kinematic mirror mount allows precise, easy alignment of the cavity. Wavelength modulation and servo-control of the wavelength is accomplished by a piezoelectric-mounted external cavity mirror. Built-in heterodyne optics and a fast avalanche detector generate a high signal-to-noise rf signal that is used to offset lock the second laser cavity to the iodine-stabilized laser.

As with the Model 100, the Model 200 laser is completely automatic, allowing unattended operation and use by "non-specialists." An optional single-mode fiber optic output provides flexibility in the location of the laser, and lends itself to non-laboratory applications, such as absolute gravimetry.

Model 200 Block Diagram



Typical Allan Variance



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:

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

REFERENCE COMPONENT:

Component 'i' of R(127)11-5 transition of $^{127}\text{I}_2$

OUTPUT OFFSET FREQUENCY:

$+ 110.000 \pm 0.003$ MHz †

† with respect to the reference component

OUTPUT POWER:

0.6 mW minimum output power
0.8 - 1.0 mW typical output power

PHYSICAL DIMENSIONS:

20 in x 11.75 in x 4 in; 36 lb
(50.8 cm x 30 cm x 10 cm; 16.5 kg.)

ELECTRICAL REQUIREMENTS:

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

OPERATING TEMPERATURE RANGE:

15°C to 25°C

WARRANTY:

1 year on parts and labor

CDRH CLASSIFICATION:

Class II laser product

