

## LASER WAVELENGTH METER

## 872 Series



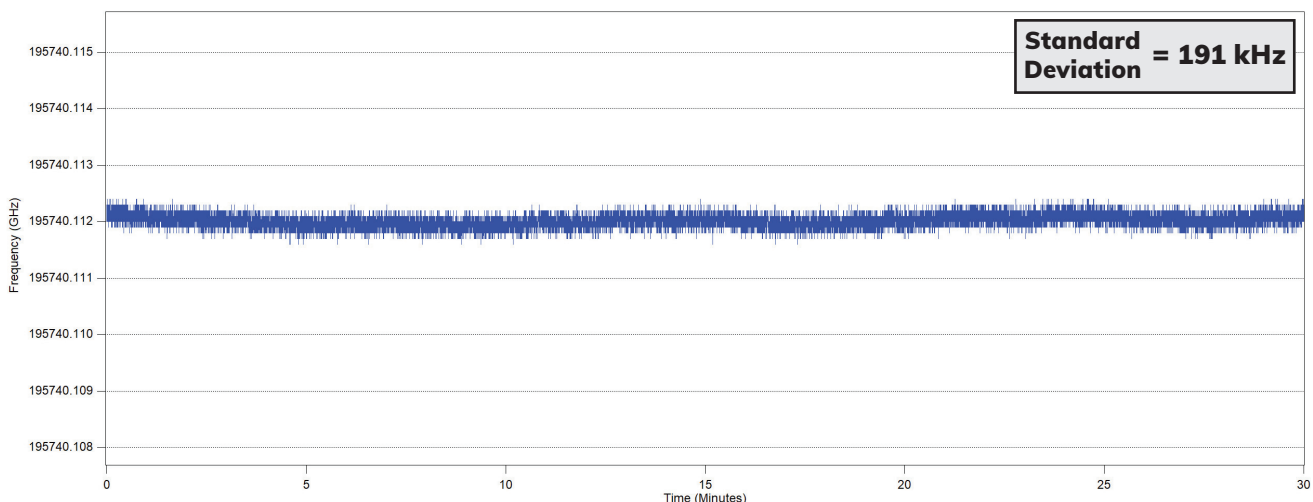
### High-Resolution Wavelength Measurement

The 872 Series Laser Wavelength Meter from Bristol Instruments builds upon our unique Fizeau etalon technology to offer very high measurement resolution. This results in exceptional sensitivity to wavelength deviations making the 872 system ideal for the frequency stabilization of lasers.

The 872 Laser Wavelength Meter measures the wavelength of both CW and pulsed lasers that operate from 375 to 1700 nm. The 872 system's accuracy is  $\pm 0.2$  parts per million ( $\pm 60$  MHz at 1000 nm) and its frequency resolution is better than 1 part per billion (300 kHz at 1000 nm). Automatic calibration with a built-in wavelength standard guarantees this performance to ensure the most meaningful experimental results.

#### Key Features:

- Frequency resolution up to 200 kHz.
- Wavelength accuracy as high as  $\pm 0.0001$  nm.
- Automatic calibration with a built-in wavelength standard.
- Operation available from 375 to 1700 nm.
- Sustained measurement rate of 1 kHz.
- Convenient pre-aligned fiber-optic input.
- Straightforward operation via PC using USB or Ethernet.
- Automatic data reporting using custom or LabVIEW programming eliminates the need for a dedicated PC.
- Built-in PID controller for precise laser frequency stabilization.
- Optional Multi-Laser PID Controller and Fiber-Optic Switch enable the characterization and/or stabilization of up to 8 lasers.
- 5-year warranty covers all parts and labor.



Model 872A-NIR measurement results for a laser diode locked to the 1532 nm absorption of acetylene.

# SPECIFICATIONS

872 Series

|  |   |
|--|---|
| <b>MODEL</b>                               | 872A  |
| <b>LASER TYPE</b>                          | Pulsed and CW   |
| <b>WAVELENGTH</b>                          |   |
| Range                                      | VIS: 375 - 1100 nm<br>NIR: 630 - 1700 nm  |
| Accuracy <sup>1, 2, 3</sup>                | ± 0.2 ppm (single-mode fiber)<br>± 0.0002 nm @ 1000 nm<br>± 60 MHz @ 300,000 GHz  |
| Measurement Resolution <sup>3, 4</sup>     | 0.001 ppm (1.0 ppb)<br>0.001 pm @ 1000 nm<br>300 kHz @ 300,000 GHz  |
| Calibration <sup>5</sup>                   | Automatic with built-in wavelength standard   |
| Display Resolution                         | 10 digits   |
| Units <sup>6</sup>                         | nm, μm, cm <sup>-1</sup> , GHz, THz   |
| <b>OPTICAL INPUT SIGNAL</b>                |   |
| Maximum Bandwidth (FWHM)                   | 1 GHz   |
| Minimum Input <sup>7, 8, 9, 10</sup>       | VIS: 3 - 300 nJ<br>NIR: 50 - 600 nJ   |
| Maximum Input                              | CW: 10 mW Pulsed: 0.5 mJ (10 ns duration)   |
| <b>MEASUREMENT RATE</b>                    | 1 kHz   |
| <b>INPUTS/OUTPUTS</b>                      |   |
| Optical Input <sup>11, 12</sup>            | Pre-aligned FC/PC fiber connector (optional free beam-to-fiber coupler)   |
| Instrument Interface                       | USB and Ethernet interface with Windows-based display program, and browser-based display application<br>Streaming via RS-422 (internal or external TTL trigger)<br>Internal data storage for up to 1 million measurements<br>Library of commands (SCPI) for custom and LabVIEW programming using any PC operating system<br>PID controller (± 5 V output) |
| <b>COMPUTER REQUIREMENTS <sup>13</sup></b> | PC running Windows 10, 1 GB available RAM, USB 2.0 (or later) port, monitor, pointing device  |
| <b>ENVIRONMENTAL<sup>7</sup></b>           |   |
| Warm-Up Time                               | < 15 minutes  |
| Temperature   Pressure   Humidity          | +15°C to +30°C (-10°C to +70°C storage)   500 - 900 mm Hg   ≤ 90% R.H. at + 40°C (no condensation)  |
| <b>DIMENSIONS AND WEIGHT</b>               |   |
| Dimensions (H x W x D)                     | 3.5" x 17.0" x 15.0" (89 mm x 432 mm x 381 mm)<br>Includes mounting hardware for 19-inch racks  |
| Weight                                     | 17 lbs (7.65 kg)  |
| <b>POWER REQUIREMENTS</b>                  | 90 - 264 VAC, 47 - 63 Hz, 50 VA max   |
| <b>WARRANTY</b>                            | 5 Years (parts and labor)   |

- (1) Defined as measurement uncertainty, or maximum wavelength error, with a confidence level of ≥ 99.7%.
- (2) Traceable to accepted physical standards.
- (3) Single-mode input fiber must have single-mode performance at the wavelength of the laser under test.
- (4) Standard deviation within 10 minutes under constant ambient conditions.
- (5) For VIS version, stabilized single-frequency HeNe laser. For NIR version, laser diode locked to acetylene absorption (NIST Special Publication 260-133).
- (6) Data in units of nm, μm, and cm<sup>-1</sup> are given as vacuum values.
- (7) Characteristic performance, but non-warranted.
- (8) Required minimum energy from a single laser pulse. Greater sensitivity is achieved by increasing the length of the measurement window to allow for the integration of a greater number of laser pulses.
- (9) Required minimum power is approximated by multiplying the required minimum energy by the selected measurement rate.
- (10) Sensitivity at specific wavelengths can be determined from graphs that are provided in the 871 Series Product Details brochure.
- (11) Visual inspection and optimization of the interference fringe pattern is not required.
- (12) An FC/PC terminated input fiber is required. System will not operate with FC/APC terminated fiber.
- (13) For use with Windows-based display program. Interfacing via SCPI can be done using any PC operating system.



Bristol Instruments reserves the right to change the specifications as may be required to permit improvements in the design of its products. Specifications are subject to change without notice.