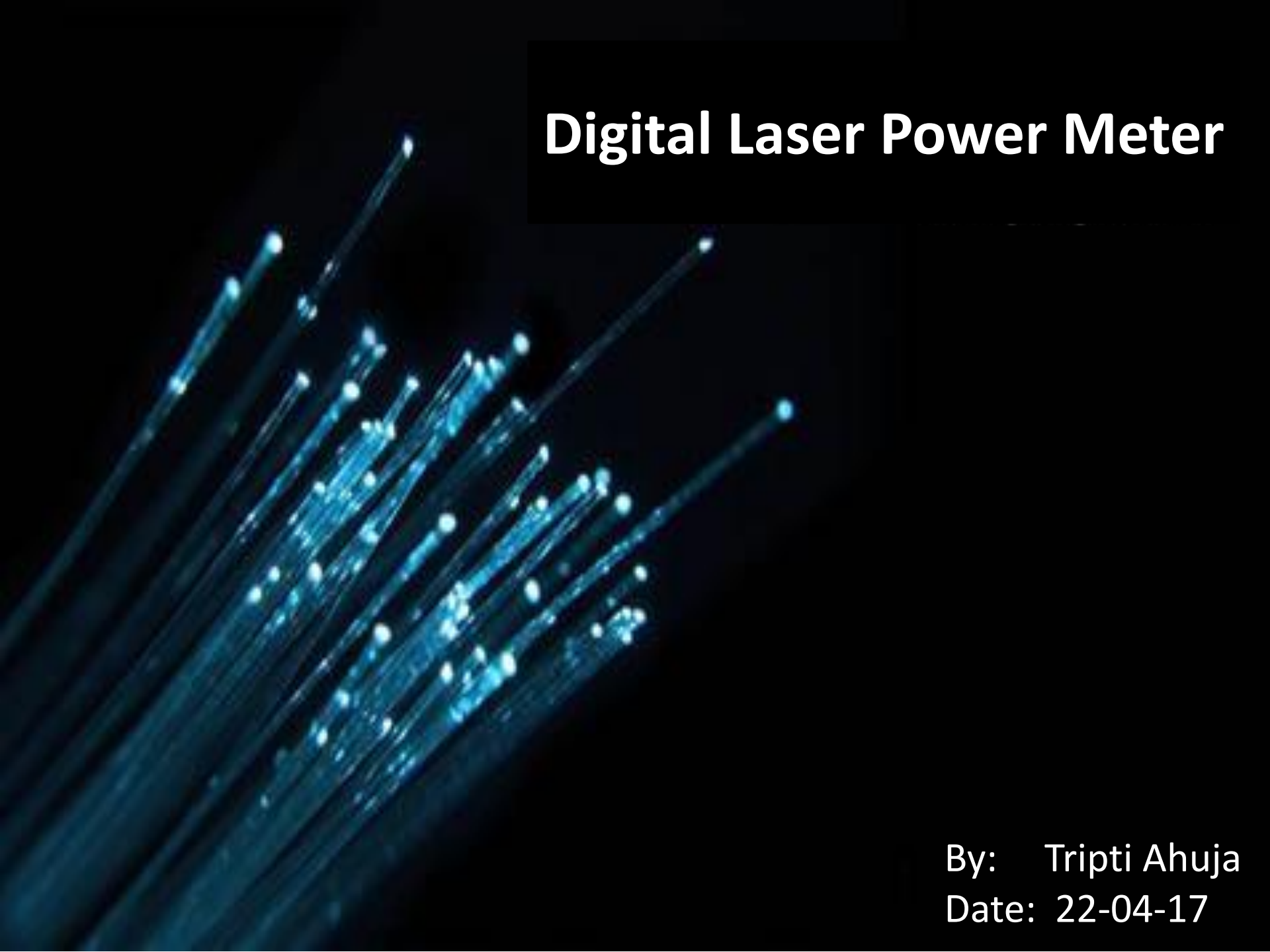

Digital Laser Power Meter

By: Tripti Ahuja

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Introduction

- It is a simple optoelectronic set-up.
- It is used to measure the power of the optical signal by fiber optic systems.
- It consists of sensors mainly photodiode sensors or thermopile laser sensors.
- These are of various types : (a) Wavelength selective meters
  (b) Sensitivity meters
  (c) Sensor selective meters

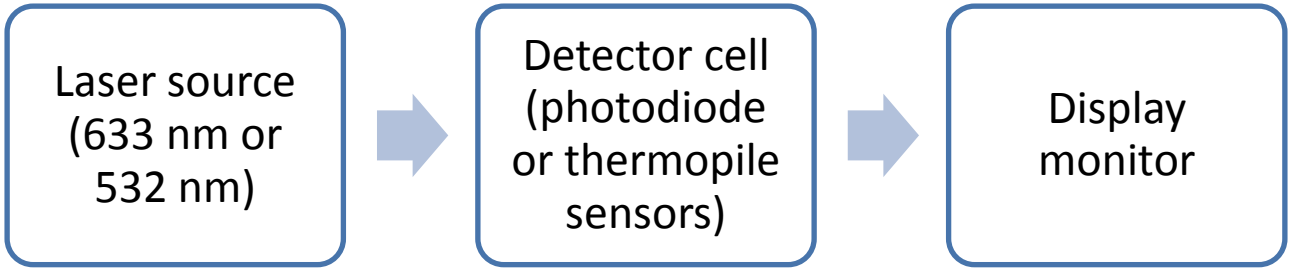
Ref: (1) D. Choudhury, M. Devi, A. K. Barbara, Indian Journal of Pure and Applied Physics, 2006, 801-804.
(2) https://en.wikipedia.org/wiki/Optical_power_meter.

How does a digital laser power meter looks like?

The below figure illustrates the pertinent parts of the laser power meter:

Ref: Laser power meter user's guide by Industrial fiber optics, Inc, Revision D.

How it works?



Steps followed for its operation…

✓ Make sure the meter is on. (Meter can be powered by battery or direct AC power supply.
✓ The switch mode is in continuous mode or in peak/hold mode.
✓ Power range selection has to be done.
✓ Position the photocell detector so that minimal amount of the ambient light is getting into the cell and then rotate the zero offset knob to obtain zero reading.
✓ Illuminate the detector cell aperture with laser beam and measure the power readings.

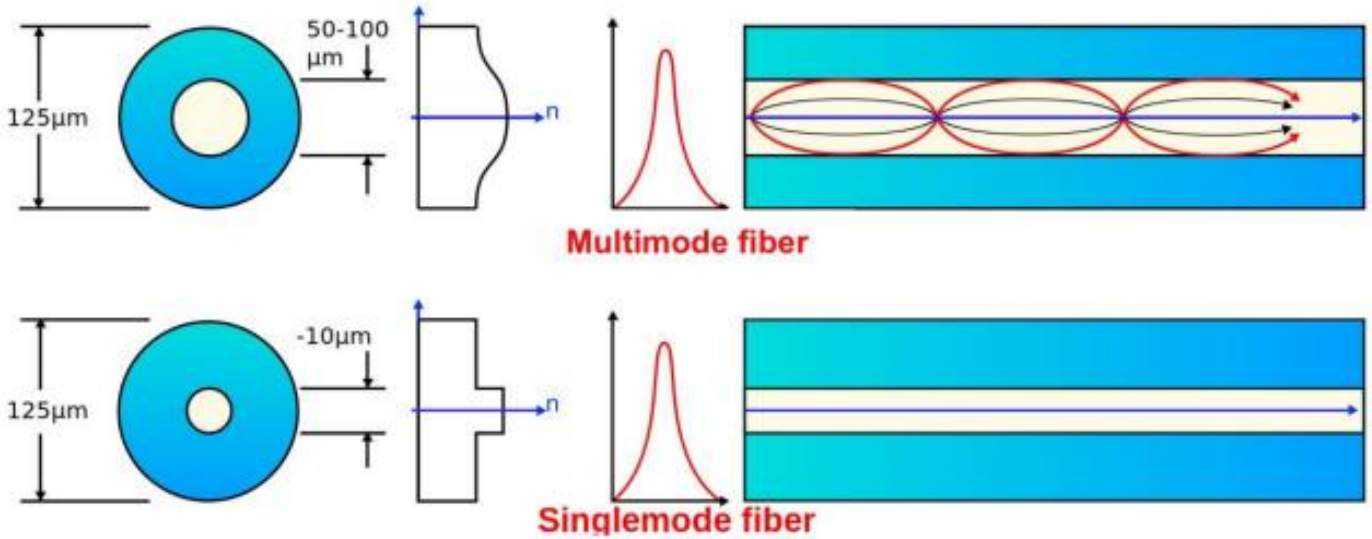
Calibration and accuracy

❖ For exact precision and accuracy, calibration is required.
❖ Standard refernces of known brightness and power are available for calibration.
❖ The calibration potentiometer is adjusted with the flat blade screw until the display equals the standard.
❖ Calibration and accuracy of power meters is contentious issue. The calibration accuracy provided by NIST is about one part in thousand and instrument calibration is only few %.
❖ To obtain claimed accuracy several factors are taken into account : ambient temperature, optical connector type, wavelength variations, beam geometry variations, detector saturation etc.

Troubleshooting

❖ LCD remains blank or shows no zero reading due to on/off switch not properly on or battery is weak.
❖ No change in display reading due to laser not striking the detectors sensitive area, or battery is weak.
❖ Too much ambient light also display erroneous reading.

Difference between single and multi mode optical fiber




Thank you