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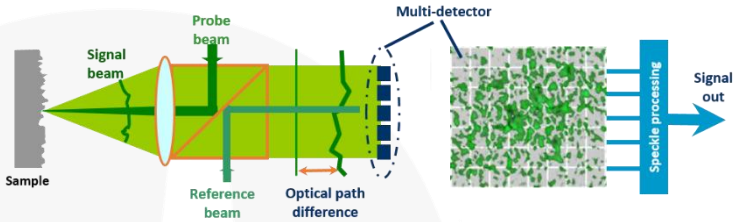
Multi-Purpose Laser Receiver

Laser
Ultrasonics

Technology

The **Multi-Purpose Laser Receiver** was born from a research and development grant from NASA and the National Science Foundation.

The receiver combines the advantages of homodyne interferometry and multi-detector ability. The beam reflected by the sample rough surface has many speckles. The signal multi-speckled beam is combined with the reference beam and focused on 50 photo-detectors. Each detector collects a few speckle and delivers an homodyne signal.



Each homodyne signal is processed in parallel using a patented signal processing architecture, based on *"random quadrature"* demodulation scheme taking advantage of the random phase distribution inherent to speckle light. The detectors produce a time-varying analog voltage that is proportional to the rectified instantaneous surface displacement at ultrasonic frequencies.

Features

-> Not dependent of the laser wavelength: from visible to IR
-> Fiberized
-> Inspection on rapidly moving object
-> High sensitivity on all surface types and materials
-> Continuous, modulated or long pulse detection laser

Examples of Applications

On-line inspection

When propagating through a specimen, the ultrasonic waves carry information about the inner structure. Similarly, when propagating along a surface, the information about the surface quality and surface coatings can be extracted.

Quality control

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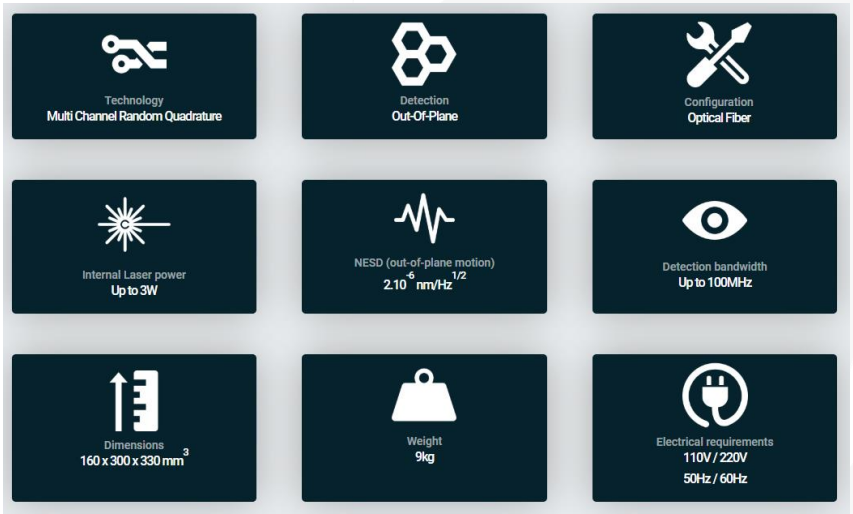
Thickness measurement

If the sonic velocity of the material is known, it is possible to measure the thickness of the specimen. Using a pulse-echo configuration (detection and generation on same side and superimposed), with the velocity of sound **c** and the time **t** between two peaks, the distance **d** in the material can be calculated.

Specifications



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