



## **Name of the Technology:** Ultrasonic Pulse Velocity Tester Device with Threshold Error Correction

**Summary:** Ultrasonic pulse velocity (UPV) is an extremely useful parameter to investigate the mechanical properties of bulk materials such as metals, composites and concrete structures. By measuring the ultrasonic transit time through the material other related properties can be evaluated. Recently CSIR-NPL has developed a unique UPV tester with automatic threshold error correction facility for more accurate transit time measurement. The device is battery operated and is suitable for site operations. Any generalized commercially available transducers of suitable frequency can be used.

### **Applications:**

- ✓ Ultrasonic transit time measurement in metallic, non-metallic, concrete, or any material supporting ultrasonic propagation
- ✓ Ultrasonic velocity measurement
- ✓ Estimation of concrete strength
- ✓ Homogeneity and quality estimation of concrete materials
- ✓ Estimation of dynamic modulus of elasticity in concretes

### **Novelty features of the technology:**

- Automatic threshold error correction
- Transit time measurement range: 0 to 50 ms
- High measurement resolution: 0.05  $\mu$ s
- Automatic PRR
- Selectable gain: 20 dB to 60 dB

### **Advantages of the technology:**

#### **More Accurate**

- MOSFET based capacitor discharge to deliver high power.
- The provision of providing automatic threshold error correction results in ultrasonic transit time (delay) measurement relatively accurate.
- The transit time measurement involving difference in the threshold corrected zero offset and threshold corrected material time delay ultimately minimizes the error in the actual transit time measurement.
- Highly sensitive envelop detector for small signal amplitude detection.





- Ability to detect wrong pulses and hence minimizes wrong measurement.

**Readiness level of the Technology:**

Idea	Concept Definition	Proof of Concept	Prototype	Lab Validation	Technology Development	Technology Demonstration	Technology Integrated	Market Launch

**Related Patents:** Patent Filed No: 202111048097, Country(s): India and USA, Application Number and Date: Not Applicable, Publication Date: Not Applicable, Grant Date: Not Applicable

**Year of Introduction:** 2021

**Broad Area/Category:** Electronics & Instrumentation

**User Industries:** Ultrasonic Non-Destructive Testing and Testing and Calibration Laboratories