



Surface Acoustic Wave Technology Demonstration Kit SAW-TDK1

**Sensors based on Surface Acoustic Wave Technology
allow break-through new applications and offer value-added replacement
for many existing sensing solutions**

VALUE-ADD BY OUR TECHNOLOGY:

- **Wireless operation yet the sensor does not require an energy source (i.e. no battery)**
 - For use on moving & rotating parts
 - For places hard or impossible to reach
 - To avoid cables when they are not ideal
 - and to help conserve the environment
- **Very robust, stable and environment independent**
 - For use at high temperatures
 - In places with very strong electrical or magnetic fields or under radiation
 - In places with hazardous environments
 - For little or no calibration and maintenance
- **Large measurement range, high sensitivity & reliable measurement**
 - Low- to high temperature & strain measurement range with high sensitivity
 - Continuous and real-time monitoring
 - Multi-measurement with a single sensor – like temperature and pressure in one single, small sensor
- **Easy-to-use solution**
 - Very small & easily installed
 - Easy integration into existing solutions through standard interfaces

SENSeOR has developed the SAW-TDK1 with the objective to offer an optimal technology evaluation tool for customer use.

Technology components that are included in the kit represent the state-of-the-art in surface acoustic wave sensing and are optimized for flexible use by the customer.

This version of the SAW-TDK1 includes all parts required for a complete temperature sensing system.

Additional high-temperature as well as pressure and stress sensors will be made available quickly in successive versions of the kit.

SENSeOR is configured to develop custom optimizations, custom products and even complete vertical solutions – combining world-class competencies, means and partners.



For biological and chemical sensing, please see our
Microbalance Development Kit !

The main advantages of the SAW-TDK1 include:

- 433MHz implementation of a family of Interrogators which are configurable from best attainable performances to lowest-possible cost !
- 3 different antenna types in order to facilitate evaluation in different customer application environments.
- 3 Temperature Sensors - Additional sensors (high temperature, pressure, strain, etc.) can be added at a low price soon.
- Software including a GUI and a documented programming interface facilitate evaluation
- Low price

Please see the datasheet for details !

Application examples where Surface Acoustic Wave technology achieves breakthrough performances include:

Industrial	Transportation	Health, Security, Environment
<ul style="list-style-type: none"> • From low to high Temperature in typically difficult industrial environments – like power generators, turbines, high-voltage switches & conduits, electric motors • Very high Pressure – like in molding • Very low Pressure in semiconductor fabrication • Structural health & condition monitoring 	<ul style="list-style-type: none"> • In-engine bearing temperature measurement • Stress sensing in maritime and aerospace vehicles • Real-time, accurate Torque measurement 	<ul style="list-style-type: none"> • Implantable temperature and pressure sensors • Biotech screening and kinetics • NRBC/E sensing • Air and water pollution screening

How acoustic wave sensing works:

- Reverse piezoelectricity induces a mechanical deformation (i.e. a surface acoustic wave) on the substrate due to an electrical field generated at the electrodes of the sensor.
- The velocity of the surface acoustic wave is very sensitive to surface state.
- Under the effect of the physical parameter which is sensed, the velocity or the delay length is modified. We can measure the delay or corresponding phase ; the attenuation and the frequency.
- In order to compensate for unwanted effects due to other physical parameter variations a reference sensor is usually implemented.
- Design of the sensor can be personalized for each application by selecting the material, the wave type, the structure and the frequency of the device.
- For wireless Operation an electromagnetic wave is sent by the Interrogator and converted into a mechanical wave on the surface of the acoustic wave chip. The mechanical wave is reflected and resent to the interrogator which allows to measure physical phenomenon.

