



Press release – June 22nd, 2009
FOR IMMEDIATE RELEASE

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WIRELESS & BATTERYLESS TEMPERATURE MEASUREMENTS: REVOLUTIONARY PRODUCTS BY SENSEOR

These latest wireless temperature sensing solutions for harsh environments are specifically tailored for new applications until now unexpected regarding critical equipment monitoring as well as process control.

New-generation products commercially available

SENSeOR today announces three unique wireless temperature sensing solutions based on SAW (Surface Acoustic Wave) sensors particularly designed for the most demanding industrial applications.

More than a rudimentary wireless measure, **SENSeOR**'s innovative solutions own a very special feature: they are totally passive. Sensors are indeed only powered by the energy of radio waves emitted by the associated reader unit when remotely interrogating the devices in real-time. The ensuing benefits are then unique.

First of all, without any batteries nor active electronic components at sensor level, these cutting-edge sensing solutions are perfectly appropriate for use in explosive atmospheres or irradiated environments at temperatures reaching +175°C today (current in-house R&D efforts target +350°C) with almost unlimited autonomy. In addition, by avoiding problematical wires these maintenance-free and light-weight sensors can either be mounted onto an extensive range of rotating and moving machinery parts or be implemented in inaccessible places.

As a result, two thermowell-packaged wireless temperature probes **SED-100** and **SED-120** are launched on the market (sizes available on request). Not only they are especially dedicated to wireless temperature measurements inside critical equipments or at the heart of industrial processes, but they also comply with well-established standards within the industry.

Furthermore **SENSeOR** is pleased to announce the market launch of a novel system to monitor surface temperature, namely **SA-D003**.

A robust, mature and unique technology

Each measurement solution comprises a reader unit (also referred as interrogator) and the sensor mounted with its associated antenna. The interrogation distance between the sensor and the reader unit can reach up to several meters in open space. To make it short, the technological advantage behind surface acoustic waves relies on the reverse piezoelectric effect.

On the one hand, the electromagnetic wave sent by the interrogator is received then converted into an acoustic wave, by means of a transducer located at the surface of a piezoelectric crystal (typically quartz). Temperature variations related to the nearby environment of the SAW sensor trigger a modification of the acoustic wave's physical properties when propagating along the surface of the device. In return, the modified acoustic wave is then transformed back into an electromagnetic wave to be retrieved by the reader unit.

The integrated building block of those above-presented sensing solutions, **SE-AS10** SAW sensor, is also commercially available as sole device, capable to sense temperatures ranging from -20 to +175°C with a measurement precision of $\pm 2^\circ\text{C}$. This tiny sensing element (only 5 x 5 x 1.5 mm³) can be associated with different types of customized antennas, depending on the environment characteristics as well as implementation constraints.

Highly promising industrial applications

Condition monitoring indeed allows planning maintenance operations only when necessary. Andreas Jagtøyen, General Manager Machinery Instrumentation at Kongsberg Maritime AS (Norway), a partner who has industrialized a SAW-based in-engine bearing temperature sensor for vessel motors, confirms *“we have installed thousands of systems working in the toughest conditions – and none of the sensors has ever failed. We will use this technology for other break-through applications”*.

Besides this application already in production, **SENSeOR** is also strongly involved in several customer projects with French world-leading companies in the field of energy, industry and transportation, aiming to industrialize even more successful prototypes. Not to forget some developments in the medical sector.

The non-exhaustive range of applications that can be covered by SAW sensing comprises temperature measurements inside tyres at 250 km/h, at the surface of an electric engine's rotor at 5000 rpm, or even inside high voltage breaker boxes.

Finally, it is important to highlight that stress sensors designed by **SENSeOR**, still at product development stage at the present time, are intended to deliver superior technical characteristics compared to existing solutions available on the market.

Fully committed to help partners to improve reliability of installations

Provide a sensing solution which is working for a specified application, where no other existing products work: this is an objective of paramount importance for **SENSeOR**'s engineers and PhDs. Increased lifetime, optimized efficiency, reduced maintenance time as well as maximized security of industrial equipments are truly **SENSeOR**'s key commitments.

“We continuously do our best to understand in details the way we can help maintenance, production and process engineers. Our latest product innovations aim to match their expectations such as high temperature measurements without costly and unmanageable cables, together with robustness and environmentally-friendly concerns” states François Gégot, Director of Business Development at **SENSeOR**. *“Temperature measurements inside rotating machines (engines, turbines, pumps...), tanks, ovens, buried pipelines or even inside materials like concrete (incorporated sensors) become easy and accessible”* he added.

With respect to other critical business issues, **SENSeOR** is still providing its exclusive **SAW-TDK1** demonstration kit to explore and evaluate the scope of possibilities offered by this revolutionary technology. It includes the visualization software, a reader unit working in the ISM band at 434 MHz and three temperature sensors mounted with a set of antennas adapted to client's requirements.

It is worth to spot that the company is always looking to build other fruitful industrial partnerships to achieve further technology developments.

For more details on the temperature sensing solutions, **SENSeOR**'s team will be pleased to answer your questions at +33 (0) 497 231 320 or by email at contact@senseor.com. For further information on other SAW sensing solutions (stress, pressure, chemical) don't hesitate to visit www.senseor.com.

About SENSeOR

Dedicated to lead the market of SAW (Surface Acoustic Wave)-based sensing, **SENSeOR** is a technological company located in Sophia Antipolis (near Nice) and Besançon, France. Top competencies for all required domains, strong partnerships with world-class research institutes, an outstanding portfolio of technology bricks & IP and industrial production partners allows the high-tech firm to lead this revolutionary technology for optimal customer value.

Its growing product portfolio strives for delivering high-ROI solutions either for end-users or system integrators and OEMs, in the field of temperature, stress, pressure and chemical sensing.