

Visit CSEM from 6.10.2015

About twenty members from the two associations: sensors.ch and GESO participated in the visit of CSEM based in Neuchâtel. The proposed agenda to the participants was a general presentation of CSEM by the head of marketing followed by three technical presentations on specific topics related to sensors. After the presentation session, the members were divided in two groups to visit the biomed laboratory and the showroom. This large space displays various demonstrators developed by CSEM. The visit ended with a friendly nice cocktail gathering the participants and CSEM team.

CSEM Company

CSEM is a private Swiss research and technology organization (RTO) with the mission – primarily within Switzerland – to develop microtechnologies and transfer them to the industrial sector, thereby reinforcing the sector's competitive advantage. CSEM customers operate in established markets such as medtech, industrial control (including the machine tools industry), watchmaking, and aerospace, as well as in emerging markets such as cleantech (including energy production and management) and environmental monitoring (in transportation or agriculture).

Under contract to the Swiss Confederation, CSEM develops innovative technology platforms through five strategic programs – **microsystems, systems, ultra-low-power integrated systems, photovoltaics, and surface engineering** – corresponding to domains in which it has acquired over the years a national and international reputation. By expanding its knowledge and adapting it to the needs of industry, new products are brought to market and new ventures are created. Approximately 400 people with industrial backgrounds, mostly top-level engineers and holders of PhDs, dedicate their passion to this mission.

Internal R&D project “wear-a-watt”

CSEM is working on an energy harvesting solution integrated in a wearable wristband. The targeted solution combines a flexible photovoltaic solar cell with integrated electronics for the energy management: it collects the ambient light, transforms it into electricity, which will be either stored or fed to the consuming part. This innovative technology will be deployed across the wearable technology market for health, fitness or (smart-) watch applications.

MEMS, Enabler in product innovation

CSEM has a strong experience in the design, technology development, prototyping, production and testing of MEMS. Its manufacturing reputation has been built in the Swiss watch industry.

Development of MEMS-based devices involves the commitment of several disciplines. CSEM is able to offer its customers and partners a full solution including MEMS, ASIC, system integration, packaging, and testing, as well as training, all with the guarantee of the utmost reliability. CSEM also offers industry small-scale production of MEMs components as well as packaged microsystems.

Low power microelectronics for sensors

The ULP integrated systems activity involves a team at CSEM of more than 60 experienced designers, including experts in ASIC design, wireless systems, embedded software, photonics, and vision systems. Such systems may include a Systems-on-Chip (SoC) with analog, RF, and digital processing functions combined with off-chip antennas, imagers, sensors, MEMS, and energy sources into a heterogeneous system. The hardware and the software are optimized together to achieve the best level of performance in terms of energy consumption, size, and also cost, which is a key requirement of many applications such as wireless sensor networks, wireless body area networks, and embedded vision systems

Biomed laboratory

Today's medical device technology is able to measure physiological parameters such as ECG, blood pressure, cardiac output, etc., at a clinic or physician's practice.

However, it generally remains highly challenging to measure them non-invasively and unobtrusively under ambulatory conditions, e.g. during daily activities or exercise.

CSEM targets the integration of innovative sensors and processing techniques for patient monitoring into wearable devices and smart clothes. CSEM's innovative multiparameter sensor-technology and the use of cutting edge data transmission techniques provide the potential to assess, 24/7 in real time, the user's health status, with full consideration for comfort and ergonomic standards.

CSEM startups will launch a state-of-the-art biomedical monitoring platform for the world of sport, aiming to take athlete training and preparation to a new level. This portable system enables continuous and simultaneous measurement of the main physiological signals such as electrocardiogram, respiration, blood-oxygen saturation, or body temperature.

Further information is available at www.csem.ch
Pictures on next page

Report by Philippe Krebs

Pictures for visit report



CSEM SA Headquarters in Neuchâtel



CSEM Showroom



SenseCore: Portable system to efficiently manage training