# FROM VISION TO IMPACT

csem

FACING THE CHALLENGES OF OUR TIME

# What do you **BELIEVE** in?

We believe in a future that is imagined, shared, and created **TOGETHER**.

At CSEM, we don’t just innovate, we envision technologies that shape tomorrow.

Since 1984, our purpose has remained constant: to harness science and technology for the benefit of society. Today, with over **650 people** across Switzerland, we remain committed to our mission: to develop and transfer world-class solutions in **digital technologies**, **precision manufacturing**, and **sustainable energy systems**. In doing so, we empower Swiss industry to innovate and remain competitive.

These pages are a glimpse into the future we’re building, with purpose, with people, and with vision.

# Vision

*We believe that through our technologies and together with academia, our clients and partners,*
***we can face the challenges of our time.***

How do we face the challenges of our time?

# How?

*By being an **innovation factory** and putting our expertise and infrastructure at the service of companies to guarantee the wealth of the Swiss economy.*

# HOW?

*By creating impact through applied research and technology transfer.*

## Applied Research

We develop next-generation deep technologies with the potential to transform industries and improve people's lives.

## Technology Transfer

We customize and develop new products, processes, and services with our clients that address their unique needs.

How do we face the challenges of our time?

# HOW?

*By shaping the future through*
***3 research priorities**:*

## 1 Digital technologies

Intelligent systems.
Real-world transformations.

## 2 Precision manufacturing

Engineering the invisible.
Scaling the impossible.

## 3 Sustainable energy

Smart energy systems.
A cleaner tomorrow.


Supporting our *VISION*
7 AREAS OF EXPERTISE
within the same innovation factory

# Medtech

We put our heart into developing **smart, mobile medical technologies** that make care more preventive, more personal, and more accessible.

With over two decades of experience in developing health wearables, medical devices, and **IoMT** (Internet of Medical Things), our team combines medical device expertise with certified development processes. Our unique value lies in the ability to deliver mobile, cost-efficient, and validated healthcare technologies that are clinically proven, yet accessible to all. Through **patented sensor technologies and licensable algorithm libraries**, we empower scalable solutions that reach beyond hospital walls. Our proximity to leading medical institutions and our collaborative approach spanning digital health, AI, ASIC design, and secure IoT amplify our reach and relevance.

Because we believe that healthcare should not be a privilege, but a possibility for everyone.

# Tools for life sciences

We dedicate our expertise to **bridging life sciences and technology**, making precision medicine a reality for all.

From biosensing and cell technologies to lab automation and interpretable AI, we bring together biology, engineering, and data science to support the future of personalized medicine.

Positioned at the forefront of **TechBio**, we harness novel sensing modalities, microtechnology, and advanced computational biology to **unlock new biological insights**, **accelerate drug discovery, enable novel regenerative therapies, and transform diagnostics.** Our unique strength lies in designing and validating integrated systems: from smart labware and sample handling robots to point-of-care and on-body monitoring devices. With explainable AI and deep data integration, we bring **clarity to complexity and scale to innovation**.

Because when care is tailored, lives are transformed.

# Micro and nano systems

Our commitment to expanding our process technology and manufacturing platforms—spanning multiple domains from the nano to the meso scale—is **pushing the limits of what's possible**.

From component design to prototyping, and from process development to small-series production, we deliver end-to-end solutions across sectors such as **MEMS**, **photonics**, **micro-optics**, **sensors and actuators**, **microfluidics for cell biology**, **space and aeronautics**, and **high-precision watchmaking**.

Our strength lies in our ability to connect breakthroughs across disciplines and size **scales**, while mastering complex materials and advanced techniques such as additive manufacturing and nano-imprinting. This makes us a trusted partner for both disruptive innovation and reliable industrialization. We operate state-of-the-art cleanrooms, additive manufacturing facilities, optics and chemical laboratories, and top-tier characterization infrastructures.

This infrastructure is not only essential for process development, but also a **key enabler for scaling technologies** and transferring them into real-world industrial applications.

Because the smallest details often shape the biggest breakthroughs.

# Integrated and wireless systems

We strive to create **systems that seamlessly collect, process, and share data** with unmatched efficiency.

From **ultra-low-power chip design** to **full-stack connected devices**, we bring together a rare blend of disciplines: **RF**, **edge AI**, **vision systems**, **ASIC design**, and **embedded software**, to deliver intelligent, application-specific systems. What makes us unique is our **mastery of the entire design chain**, from nanometer-scale optimization to real-time communication across distributed sensor networks. Our systems are not only efficient but also highly adaptable, rugged, and secure.

Because smarter systems lead to smarter outcomes.

# Industry 4.0

We channel our innovation into **AI-driven automation** that ensures perfect quality, high adaptability, and production you can trust.

We integrate cutting-edge AI with industrial automation to meet the real-world demands of modern manufacturing: precision, speed, and customization. Our strength lies in **combining machine learning**, **human-centric assistance**, **cognitive robotics**, and **data-driven process control** into intelligent, modular solutions. These technologies don't just support manufacturers, they transform them. By helping Swiss and international industries adapt and lead, we safeguard productivity, competitiveness, and sovereignty.

Because the future of manufacturing should be both flexible and flawless.

# Instrumentation

We design **breakthrough instruments** that help researchers and industries see deeper, measure further, and discover more.

We specialize in building complete, high-performance systems: from **atomic clocks** and **stabilized lasers** to **quantum sensors** and **space-qualified instruments**. What sets us apart is our ability to design and integrate precision opto-mechanics, lasers, photonic integrated circuits, control algorithms, and electronics into one seamless solution. Whether developing next-generation lidars, astrocombs, or watch movements, we go beyond prototypes to deliver market-ready platforms and spin-off technologies.

With decades of experience in space and industrial-grade instrumentation, we bring reliability and innovation together.

Because the tools we create today will power the discoveries of tomorrow.

# Sustainable energy

We commit to driving **sustainable transformation** through advanced technologies that support industries, strengthen communities, and reinforce Switzerland’s place among the global leaders in energy innovation.

We offer comprehensive **expertise across the entire energy ecosystem**, including battery innovation, photovoltaics, and digital energy intelligence. What distinguishes us is our ability to develop tailored, robust, and environmentally sound platforms that **accelerate the energy transition**. Whether it’s optimizing battery management systems (BMS) with electrochemical impedance spectroscopy (EIS) diagnostics, forecasting energy flows with AI, or producing next-gen solar modules, our solutions are built to scale and to last. With deep system-level knowledge and cross-disciplinary synergy, we help shape resilient and flexible energy infrastructures.

Because energy is the driving force behind our society.

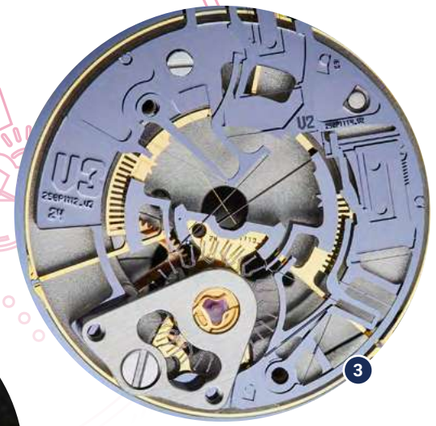

Turning *VISION into*
**real-world value.**
Explore the *INDUSTRIES* we serve

# Watchmaking

**Autonomy via solar energy and independence via a Swiss digital platform were the guiding principles for our new watch, and CSEM—with its decades of experience accelerating innovation and industrialization in photovoltaics and low-power systems—proved an ideal multidisciplinary partner for this exciting project.**

Sylvain Dolla, CEO
Tissot






1. Silinvar: The world's first silicon thermocompensated balance spring
2. Wittrick balance wheel: Made of silicon, uses crossed flexible blades to provide precisely guided frictionless oscillations
3. Siloscape escapement: Frictionless, energy-efficient watch regulator with direct impulse transmission


1. ESA Next Generation Gravity Mission (NGGM)
2. RemoveDEBRIS Space Cleanup
3. MTG Meteosat Third Generation

# Space

**The spirit of collaboration that CSEM has shown has been excellent, and I would specifically like to commend the center.**

Scott Hovland
ISS Programme & Exploration Department, ESTEC, Directorate of Human Spaceflight and Operations European Space Agency (ESA)

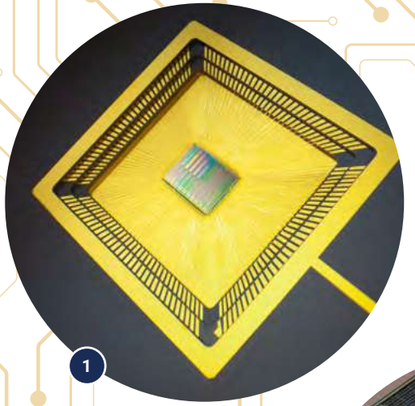
# Personalized medicine

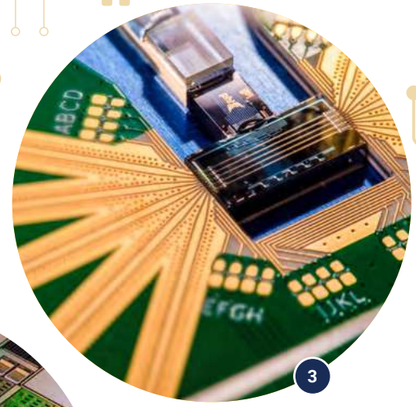
**Aktiia aims at reducing the burden of hypertension with just a sleek bracelet, the fruit of more than 15 years of research and development carried out at CSEM. Their multidisciplinary team, scientific approach, and passion for innovation have been invaluable throughout the creation of our breakthough solution for cuffless blood pressure monitoring.**

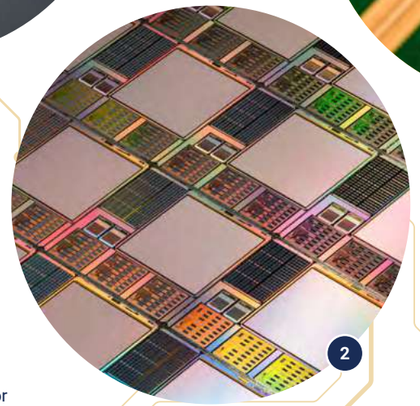
Mattia Bertschi, COO
Hilo by Aktiia




1. Cutiss' machine for bioengineering personalized skin
2. WELMO: lung monitor
3. Brain disease research tools







1. AI accelerator chip
2. World's first quantum dot x-ray sensor
3. Thin-Film Lithium Niobate (TFLN) modulators for data transmission

# Semiconductors

**CSEM has helped our ultra-wideband solution quickly gain a foothold in the automotive market and increase the security of millions of PKE-enabled vehicles, as evidenced by the ADAC experiment. This success is also helping to accelerate the adoption of UWB more broadly.**

Boris Danev, CEO
3db Access/Infineon

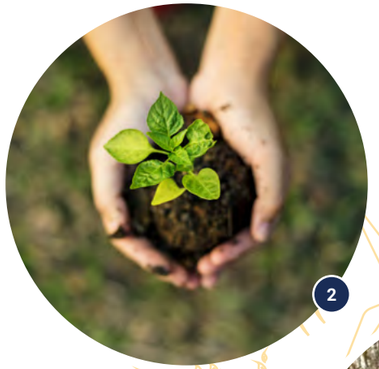
# Industry 4.0

**CSEM was the ideal partner for this project: expert in intelligent systems and algorithms, pragmatic and flexible when we had to change the data collection plan, and fast. This was our first project with CSEM—and it won't be the last.**

Mario Urbisaglia, Team Manager R&D
Bühler Group




1. Quality control of MEMS reliability and failure detection
2. Technologies for industrial battery inspection
3. Smart spring for industrial monitoring and predictive maintenance



1. Enhancing wind turbine operations through AI-driven predictive maintenance algorithms
2. Advancing sustainability in the IoT era through responsible electronics design
3. Optimizing air and soil monitoring with intelligent sensing technologies

# Environment

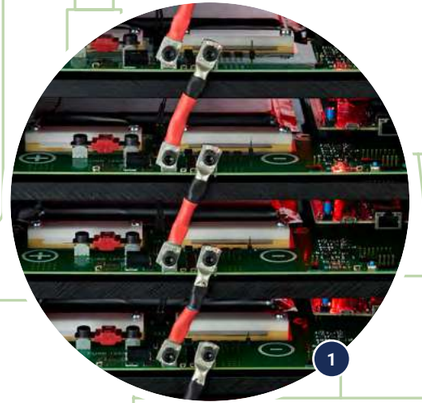
**CSEM's technology has given us a unique platform for drinking water monitoring and also for industrial, food and beverage, and pharmaceutical applications.**

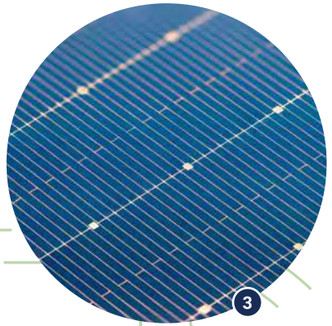
Frédéric Rufi
Head of Sensor R&D
Bürkert AG

# Sustainable energy

**We can now make the best use of data and predictive diagnostics to increase the energy production capabilities of wind farms. Given our experience with CSEM, we would like to go further and apply the same approach to other technologies.**

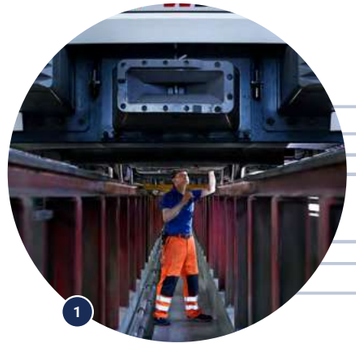
Giuseppe Madia
Chief Executive Officer
Proxima Solutions





1. Development and optimization of battery systems
2. Building-integrated solar tiles, Freesuns
3. Solar cells using copper metallization



1. RailCheck: Digital platform for surveying and analyzing railway infrastructure
2. Wireless infrastructure for maritime emergencies
3. Peggasus European Project for pilot's eye tracking technology

# Automotive and transportation

**CSEM's state-of-the-art deep learning algorithms and creative and solution oriented approach enable us to further digitalize our maintenance activities and take them to the next level. Which is important to the long-term fulfillment of our promise to clients: «We make sure it rolls!»**

Edouard Barret
Project and Sales Manager
Stadler Rail

# Let’s imagine TOGETHER

Inspired?
Let’s move from **vision**
to **innovation**.

For a bright future.
Together.

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