









ANNUAL REPORT 2023

Contents

- 3 Message
- 4 Innovation factory
- 6 CSEM at a glance

SUCCESS STORIES IN TECHNOLOGY TRANSFER

-  **8** ActiGraph LEAP™: The multi-sensing wearable for patient-centric clinical trials
-  **10** Overcoming the fabrication gap: CSEM's MEMS foundry services
-  **12** The folding photovoltaic charging system powering stratospheric balloons
-  **14** The radio control solution making industrial machines safer and smarter
-  **16** Thin-film lithium niobate on insulator: The transformative technology for integrated photonics
-  **18** neos®: The world's first neurophthalmoscope and the future of measuring brain health
-  **20** Dynamic formulation: A breakthrough in bioprinting for regenerative medicine
-  **22** Tissot's T-Touch Connect Sport: A fusion of style and fitness tech

- 24 Solar brilliance, Freesuns, and CSEM illuminate the future
- 25 The spring revolutionizing industrial efficiency
- 26 Corporate highlights
- 30 CSEM's environmental impact and efforts
- 34 Financial report
- 36 Organization



Message

What drives CSEM? Developing sustainable solutions for some of society's most pressing challenges. Partnering with like-minded organizations, from start-ups to multi-nationals, we develop cutting-edge technologies before transferring them to market. Such innovations generate in turn a positive impact on our customers' profitability, on society, and on the environment.

As an innovation factory participating in national and European projects, CSEM helps meet the needs of sectors such as renewable energy, healthcare, watch-making, and aerospace. Internal transversal programs connect technologies, producing synergies which in turn boost creativity. The space and support we offer give innovation no chance but to flourish. They come along with our broad customer base, advanced infrastructure and labs, professional IP support, impactful events, and intrapreneurial access to grant programs. Serious entrepreneurs and start-ups using science to develop new products are guaranteed a warm welcome, often much more.

CSEM's Battery Innovation Hub was opened in February 2023, thanks to the support of the Cantonal Bank of Neuchâtel. It designs energy solutions such as battery systems, storage technologies, and energy optimization algorithms. And sustainability? CSEM will never see it as just a box to be checked. Examples of sustainability-focused activities include solar modules for building integrated photovoltaics (BIPV) and lightweight products for various mobility applications, as well as our leadership in ultra-low-power microelectronics.

Dedicated to digital health, our site in Bern received approval from the canton's Grand Council to expand in June 2023. This milestone strengthened our collaboration with our partners, the Inselspital, University Hospital Bern, and the University of Bern, to develop state-of-the-art solutions for the health sector.

At the Annual General Meeting in June, we bid farewell to Claude Nicollier, whose unconditional support and extraordinary humanity made their mark on the history of CSEM. During his 16-year presidency, revenues increased by 83% and the number of employees by 75%. These developments, along with continuous support from our partners and customers, grew CSEM's annual turnover by an impressive 7.1%. That's 107.6 million Swiss francs in 2023. With our partners, we also filed nine new patent families, showcasing once again our ability to generate novel solutions. Moreover, our work with customers had a lasting and positive impact on the Swiss economy, contributing to innovation, technological excellence and job creation in various domains and markets. CSEM alone has created 24 new jobs.

In 2024, we will celebrate 40 years of innovation and technology transfer, focusing as ever on our three priorities: digital technologies, precision manufacturing, and sustainable energy. We will also pursue new partnerships and collaborations that enhance our network and reach.

Thank you for your interest in CSEM.

Andreas Rickenbacher
Chair of the Board of Directors

Alexandre Pauchard
Chief Executive Officer

“ At CSEM, we want to be both an innovation factory and contributor to societal progress. Our commitment to integrating innovation and sustainability not only drives cutting-edge technologies and solutions but also shapes a future where positive impact on society and the environment is at the core of the solutions we create.

Alexandre Pauchard
CEO • CSEM

Innovation factory

csem
FACING THE CHALLENGES OF OUR TIME



Customers facing challenges



Co-innovation

With our industrial partners

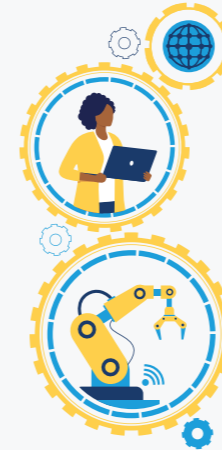
Know-how
To ensure industry-oriented support on a long-term basis

- Fixed contracts
- Industrial experience
- Swiss legacy
- Patent portfolio



Infrastructure

- To develop and scale-up proven industrial processes
- Cleanrooms
- State-of-the-art laboratories and CAD-tools
- Software toolchains
- ISO certification



Thriving business



Industry | Swiss & EU research community



Stakeholder interaction

To detect emerging trends and future needs



FOR A BRIGHT FUTURE

- We develop solutions to transform industries and improve people's lives.
- We transfer technologies to existing companies or through the creation of start-ups.

New jobs



Contribution to society

Basic government funding



1 CHF invested in CSEM generates...

Internal innovation

To develop next-generation technologies

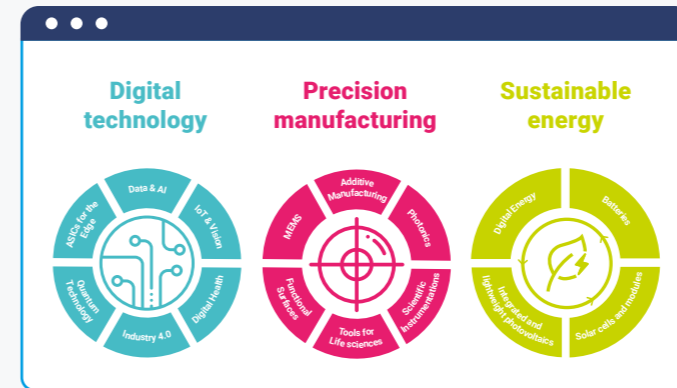


Multidisciplinary

Three research priorities with 16 focus areas evolving according to future trends & needs

Complementary

Project learnings can be applied on other use cases across diverse industries



...15 CHF value added in Switzerland

1-3
Fundamental research
Technology Readiness Level

3-6
Applied research and development of demonstrators

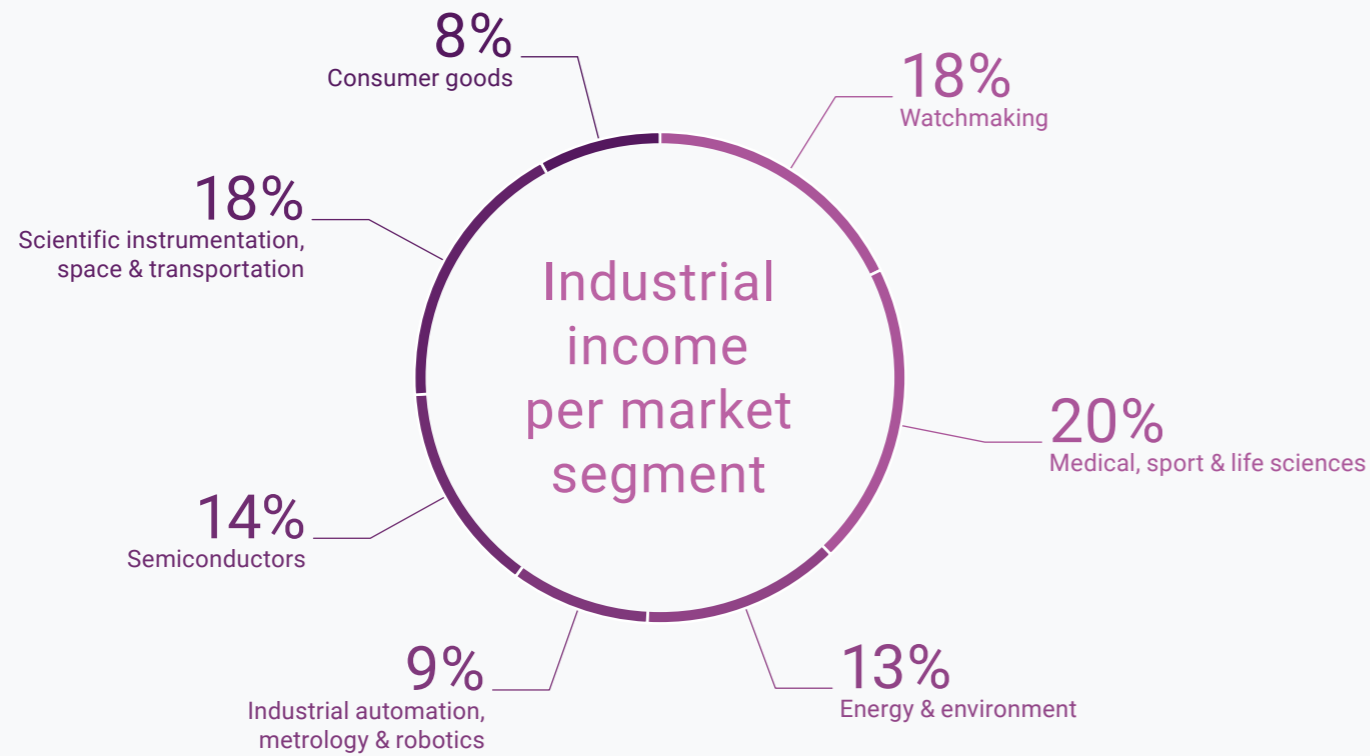
6-8
Industry prototypes

9
Products & services

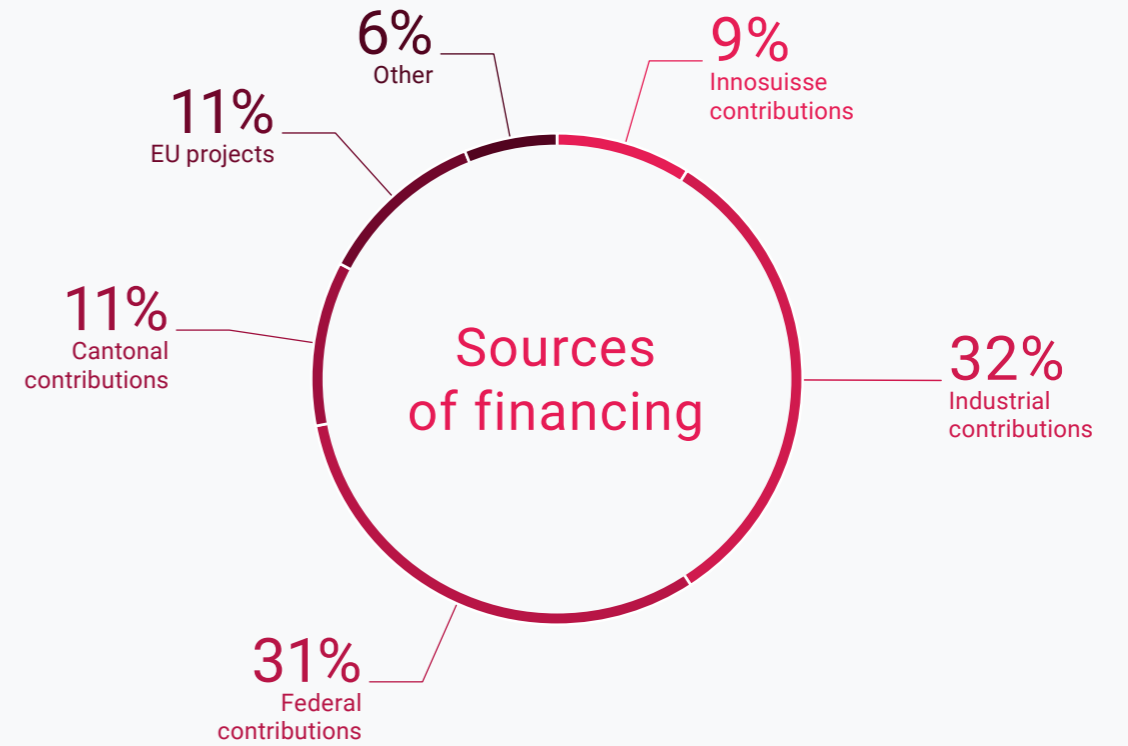
CSEM at a glance

245 Industrial clients
Contracts active in 2023

590 People
December 2023

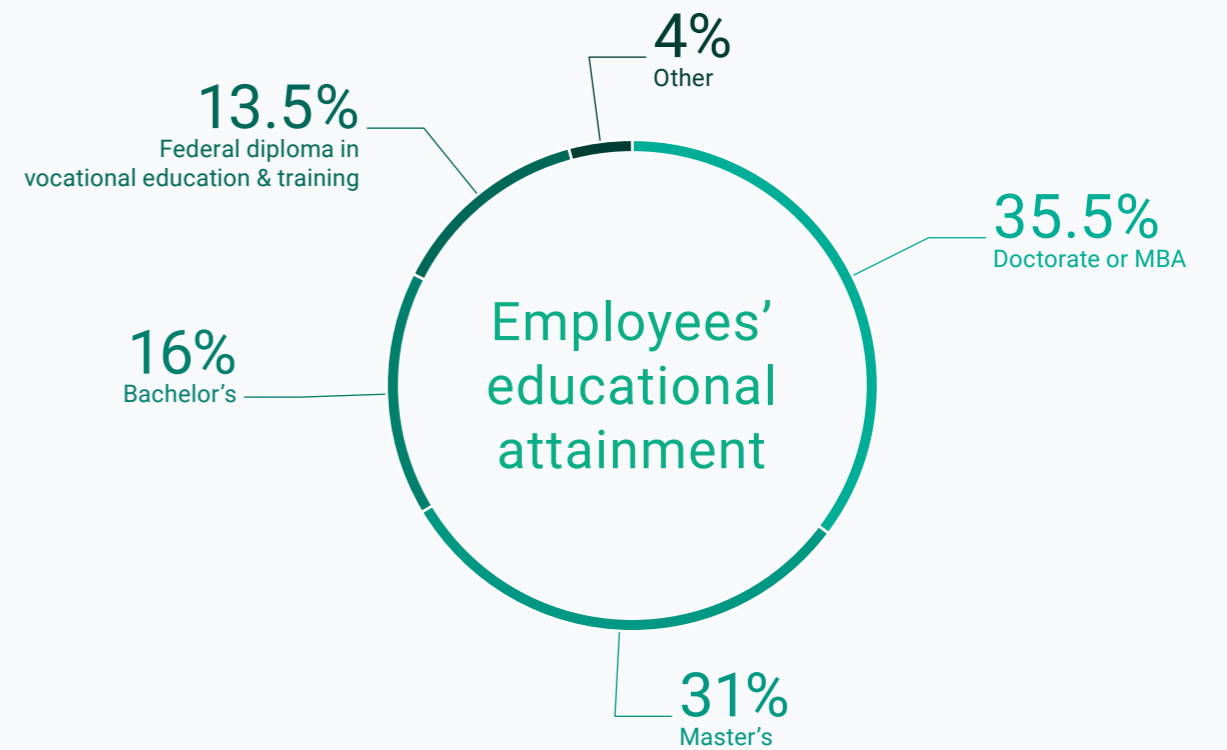


177 Patent families
6 newly filed in 2023
3 additionally filed for CSEM clients in 2023



107.6 M (CHF)
Income

45 Nationalities
Multicultural environment



ActiGraph LEAP™:

The multi-sensing wearable for patient-centric clinical trials

HOW WEARABLE DEVICES CAN IMPROVE CLINICAL RESEARCH AND PATIENT OUTCOMES

Wearable technology can collect real-time data and monitor patient conditions in various settings, providing a more accurate and objective picture of health status than self-reporting. However, patient adherence to wearable devices is a key challenge that needs to be addressed by manufacturers and providers. They can do so by introducing innovative solutions that meet the needs and preferences of the users, and by prioritizing user-centric design that enhances the usability and functionality of the devices. By improving patient adherence, wearable technology can contribute to better healthcare outcomes and other advancements.

A NEW STANDARD IN PATIENT-CENTERED CLINICAL RESEARCH

ActiGraph is a leader in wearable digital health technology and end-to-end services. Its products and services are used by academic and industry researchers to measure the effects of treatments and interventions on patients' health and quality of life. In 2023, ActiGraph unveiled its most advanced wearable to date, the ActiGraph LEAP™. This device collects continuous, multi-sensor data, offering unparalleled insights into participants' real-world functioning. Its design prioritizes participant comfort and adherence particularly via its passive data collection and stylish aesthetic. The device is US FDA 510 (k) cleared and features one of the most comprehensive sensor collections in the industry.

CSEM'S EXPERTISE THE KEY TO ACTIGRAPH LEAP™ PERFORMANCE

"We collaborated with ActiGraph in developing the LEAP™, a device that uses our optical inertial sensing technology to measure human vital signs and kinetics,"

notes Mathieu Lemay, Signal Processing Group Leader at CSEM. "This technology offers several benefits such as easy integration, high signal quality, and reliable and accurate measurements of various biomarkers and physiological parameters. These include heart rate and variability, oxygen saturation, human kinetics, skin temperature, and more. The wearable also provides real-time feedback and remote monitoring and data transmission," he adds. The data is further processed and analyzed using CSEM's advanced algorithms in the ActiGraph cloud, a secure and scalable platform that supports data management and analytics for clinical trials.

"These parameters are important indicators of health and wellness and can provide valuable insights into the mechanisms and outcomes of various therapies," says Jeremy Wyatt, the CEO of ActiGraph. "CSEM has supported the design, testing, and validation of LEAP™, a digital tool which has helped us expand our device portfolio," Wyatt summarizes. "The tool enables personalized medicine by providing an end-to-end patient-centric data solution for clinical research."

THE DEVICE SET TO TRANSFORM SOCIETY AND HEALTHCARE

ActiGraph's new device goes beyond business benefits; indeed, it could trigger societal changes. With a product that measures innovative biomarkers and physiological parameters, LEAP™ aims for better and more precise drug trials, more effective and personalized treatments, improved quality of life for patients, and reduced healthcare costs. Additionally, by combining multiple sensors in one device, the wearable enables a more holistic and comprehensive understanding of human health and behavior. CSEM is proud to be part of this innovation.

“Our partnership with CSEM exemplifies the power of collaboration, creativity, and shared dedication to patient-centric innovation. By leveraging CSEM's expertise in photoplethysmography (PPG), we have developed a state-of-the-art wearable device with the potential to transform clinical research and help patients live longer, better lives.

Jeremy Wyatt
CEO • ActiGraph

Overcoming the fabrication gap: CSEM's MEMS foundry services

CSEM HELPS START-UPS AND SMES OVERCOME THE CLEANROOM GAP

Critical to microsystems production are MEMS cleanrooms, which are often categorized into academic cleanrooms (fostering flexibility and innovation) and volume manufacturing cleanrooms (emphasizing repeatable large-scale production). However, a notable gap exists between these models, posing challenges to companies with unique production needs, such as start-ups and small-to-medium enterprises (SMEs).

THE GAP DILEMMA: CHALLENGES IN LOW-VOLUME PRODUCTION

Michele Palmieri, VP of Micro and Nano Systems at CSEM explains: "Start-ups and SMEs often find themselves lacking support from academic cleanrooms. Or else the volume of parts they need doesn't meet the requirements of large foundries." For such companies, building their own cleanroom infrastructure is an alternative. However, the costs, both initial and ongoing, can be exorbitant, jeopardizing business sustainability. CSEM's lab-to-fab solution provides a clear and de-risked path towards industrialization, enabling fast scale-up for start-ups and any organization caught in the dilemma between academic cleanrooms and large foundries."

DENSsolutions: A TESTIMONY TO SUCCESS

An exemplary success story within CSEM's ecosystem is DENSsolutions, a scale-up company revolutionizing transmission electron microscopy (TEM). Unlike conventional microscopy, TEM can reveal details on an atomic scale. "Building on shared enthusiasm and interest, we pursued an exclusive partnership with CSEM that surpassed traditional collaborations. Our primary focus is on developing high-quality MEMS chips

integral to our technology, enabling precise control of external stimuli (biasing, cooling, heating, liquid, and gas) while monitoring real-time structural and functional changes with atomic resolution," says Hugo Perez, CEO of DENSsolutions. "We sought a strategic partner with expertise in MEMS design and a commitment to the highest quality standards and swift lead-times. In CSEM, we have found a partner dedicated, like us, not only to meeting practical requirements, but also to all-round excellence."

CSEM'S LAB-TO-FAB APPROACH: A BEACON OF FLEXIBILITY AND SUPPORT

CSEM stands out by offering flexibility in emerging processes and materials, fostering innovative ideas unconstrained by academic cleanrooms or large foundries. CSEM supports an entire spectrum of needs, from design and feasibility studies to prototyping, development, characterization, reliability testing, small volume production, and even transfer to larger foundries. CSEM's production-grade equipment, operating to ISO-9001 standards, sets it apart, ensuring a clear path towards production and reducing the time required for process transfer to larger foundries.

AN ENABLER FOR THE GROWTH OF THE MICROSYSTEMS INDUSTRY

CSEM's open-access MEMS foundry services are a key enabler for the growth and competitiveness of Europe's microsystems industry. A lab-to-fab approach not only bridges the gap between academic cleanrooms and large foundries, but also empowers companies and start-ups to innovate with flexibility and robust support. CSEM's vision is to foster a vibrant and diverse community of microsystems innovators and entrepreneurs.



CSEM is more than just a MEMS foundry service provider; it is a true partner in innovation and industrialization. CSEM had the expertise, the equipment, and the attitude to help us realize our vision and bring our product to the market. We are proud to be part of CSEM's ecosystem and we look forward to continuing our collaboration in the future.

Hugo Perez
CEO • DENSsolutions

The folding photovoltaic charging system powering stratospheric balloons

A ROBUST, REUSABLE, SUSTAINABLE SOLAR CHARGING SYSTEM

The stratosphere is a critical but challenging zone of exploration. As a result, stratospheric balloons have emerged as indispensable platforms for scientific and technological exploration in this altitude spectrum. However, the scientific balloon community at CNES, the French Space Agency, has been searching for a sustainable and reusable energy generation solution for the instruments in its gondolas (the containers that carry the equipment). This is where CSEM's innovative photovoltaic (PV) Stratstore technology comes into play. Stratstore's ingenuity lies in its robust, high-performing, retractable, PV panels that open and close like venetian blinds, protecting them during landing.

SOLAR MODULE SYSTEM WITH A UNIQUE DESIGN

"We have engineered a bespoke encapsulant, a special coating, for the solar modules that can withstand harsh conditions, such as very high or low temperatures and strong UV exposure" reveals Pierrick Duvoisin, Lightweight Module Line Specialist, from CSEM. "The design of this system is also unique for this type of application—it has a solar tracking feature allowing 360 degrees of movement and which follows the Sun's trajectory even at altitudes exceeding 40 kilometers. The system has also been designed to retract into a protective enclosure upon landing, ensuring the integrity of the system and facilitating its reuse," he adds.

With CNES's support, CSEM has been able to continuously refine Stratstore's design by deploying the charging system on preliminary real-world missions. These involve deploying the charging system at an altitude of 35,000 meters before retrieving and reusing it. This process has qualified the system for further use.

TRIGGERING A LEAP IN ENERGY AUTONOMY

Jean-Marc Nicot, Expert in Onboard and Ground Systems of Stratospheric Balloons at CNES, highlights that: "Stratstore combines high-quality materials with innovative design to provide significant cost savings and energy efficiency for our gondolas. By using Stratstore, we can reduce the energy constraints of our gondolas and increase their energy autonomy. This allows us to reduce the weight and number of onboard batteries, which also extends the duration of our missions from days to months. Moreover, Stratstore is a fully reusable system aligned with our sustainability strategy."

POWERING FUTURE STRATOSPHERIC EXPLORATION AND EUROPE'S PV DOMAIN

The Stratstore solar charging system has been successfully completed, but CNES and CSEM will maintain their collaborative relationship and continue to develop and refine the system's design through successive test missions over the coming years. This evolution is driven by a commitment to enhancing performance, addressing observed limitations, and ensuring optimal functionality in response to real-world operational needs. Switzerland may be a small country, but it plays a significant role in the European PV technology sector. One of CSEM's strategies is to focus on developing high-value, highly specialized PV products that stand out in the market and showcase its expertise. Stratstore is an example of this strategy in action, changing the ways we think about and use solar energy.

“

Stratstore is a game-changer for stratospheric exploration, providing our gondolas with unparalleled energy autonomy and efficiency. Its innovative design not only offers significant cost savings, but also reflects our commitment to sustainability. This is a testament to CSEM's impact on the project and its broader implications for society and the environment.

Jean-Marc Nicot
Expert in Onboard and Ground Systems
of Stratospheric Balloons • CNES

The radio control solution making industrial machines safer and smarter

“

CSEM was instrumental in providing its expertise and innovation in co-creating our game-changing next-generation radio control solution that revolutionizes the way users operate heavy machinery and equipment. With CSEM's support, our solution enables users to control machines from a safe distance, monitor their status in real-time, optimize their operations, and protect them from cyber-attacks.

Yannick Farrer
CEO • E-CHRONOS

THE CHALLENGE AND OPPORTUNITY OF CONTROLLING MACHINES WIRELESSLY

Operating heavy machinery and equipment is a risky and challenging task for many workers in sectors such as warehousing, construction, agriculture, manufacturing, forestry, and transportation. They must deal with the constant threat of accidents, injuries, or fatalities, which can be caused by the unreliability or insecurity of radio controllers.

But what if there was a way to control machines from a safe distance, monitor their status in real time, optimize their operations, and protect them from cyber-attacks? That is what a new radio control solution co-developed by E-CHRONOS and CSEM offers. Working closely together, the two companies have revisited all aspects of the solution's design, from improving wireless connection to enhancing user experience.

HOW E-CHRONOS AND CSEM CO-DEVELOPED A NEW RADIO CONTROL SOLUTION

“Our role was to provide our expertise and innovation in four key areas: custom antennas, adaptive protocols, cellular networks, and cyber security”, notes Damien Piguet, Senior Project Manager of Integrated and Wireless Systems at CSEM. “We designed an antenna offering a seamless and secure link between the operator and the machine, with longer range, lower latency, and higher reliability than conventional controllers. We also developed and validated an adaptive protocol that ensures a smooth and responsive connection, also in complex and dynamic operations.”

“Thanks to CSEM's contributions, our next-generation radio control solution offers two redundant communication channels: radio frequency and cellular network. This boosts the security and safety of the system. The solution also features a web interface for data analytics. CSEM conducted a rigorous cyber security analysis of the system, which helped us develop features resistant to cyber threats and which protect users' data and operations,” acknowledges Yannick Farrer, CEO of E-CHRONOS.

THE MARKET POTENTIAL AND VISION OF THE NEW RADIO CONTROL SOLUTION

“Our solution has strong market potential, and we hope it will allow us to achieve a five-fold revenue increase over the next five years,” comments Farrer. “It's the result of our joint effort and vision to create a radio control solution offering more safety, security, and efficiency to users.”

The new radio control solution meets evolving demands of existing and potential equipment customers and paves the way for a new era in automation and efficiency, where operators and machines collaborate seamlessly and wirelessly, reducing risks and improving visibility in the working environment. It is the future of safe and secure industrial control.

Thin-film lithium niobate on insulator: The transformative technology for integrated photonics

A NOVEL MATERIAL PLATFORM FOR PHOTONIC INTEGRATED CIRCUITS

Thin-film Lithium Niobate on Insulator (TFLN) is a novel platform material for photonic integrated circuits (PICs). This is a game-changer in the photonics field. CSEM and its partners are leading the transformation of Lithium Niobate technology by establishing the first commercial foundry for TFLN in Europe. Their focus is on democratizing access to TFLN technology, ensuring its many benefits transcend boundaries.

THE BENEFITS OF TFLN FOR VARIOUS APPLICATIONS AND DOMAINS

Boosting efficiency across multiple domains, Hamed Sattari, Technology Manager of CSEM's PIC TFLN platform, observes that: "At the core of this innovation lies the material capability of TFLN to contribute to a sustainable digital revolution, as it can significantly reduce the power consumption and heat dissipation of photonic devices compared to other material platforms for PIC. This ability is crucial to data and telecom applications." TFLN can also enhance the performance of integrated photonics across other domains, such as biosensing, environmental monitoring, and quantum computing.

CSEM'S OPEN FOUNDRY SERVICE FOR TFLN PICs

CSEM and its partners support the photonics ecosystem through CSEM's Multi-Project Wafer (MPW) open foundry service for TFLN PICs, which allows multiple clients, from academia to industry, to share a wafer for prototyping and validating PIC designs. This service reduces development costs and environmental impact while facilitating innovation and collaboration in the photonics community worldwide. CSEM is a pioneer and a leader in offering this service globally.

MIRAEX: A SUCCESS STORY IN USING CSEM'S FOUNDRY SERVICE

Miraex, a start-up focusing on photonic sensing and quantum computing solutions, has already benefited from CSEM's TFLN foundry service. "By partnering with CSEM's foundry, we gained a head start in testing and developing our technology at a reasonable cost. Unlike mature silicon photonics, TFLN is a new and promising platform. We faced many challenges and learned a lot from CSEM's feedback and validation. They helped us improve our designs and achieve our goals faster. Thanks to CSEM's service, we discovered new opportunities in integrated photonics and boosted our start-up's growth," explains Phoebe Tengdin, Lead Optical Engineer at Miraex.

A KEY TECHNOLOGY IN SUSTAINABLE ELECTRONICS

TFLN PICs hold immense potential in the evolution of sustainable electronics. Once brought to market, this technology, which uses less power, generates less heat, and requires less material, can contribute to a circular economy, scalability, energy savings, miniaturization, and efficient industrial processes.

THE FUTURE OF INTEGRATED PHOTONICS

TFLN is a breakthrough technology for integrated photonics. It opens up new opportunities not only for photonics applications, but also in domains that have not yet tapped into this technology, such as automotive, space, and health diagnosis. With its accessible foundry service and wide network, CSEM has positioned itself to meet the emerging needs of these domains.

“

We chose CSEM as one of the first foundry services in Europe offering solutions for integrated photonics in lithium niobate. This enabled us to prototype our first functional devices and develop our designs in a progressive manner, saving us 6-12 months and validating the feasibility of our electro-optic devices.

Phoebe Tengdin
Lead Optical Engineer • Miraex

neos[®]: The world's first neurophthalmoscope and the future of measuring brain health

THE NEED FOR BETTER DIAGNOSIS AND MONITORING OF NEUROLOGICAL DISORDERS

Diagnosing neurological conditions is often challenging, time-consuming, and expensive, requiring specialized diagnostic equipment and expertise. Moreover, as many neurological disorders worsen and become incurable over time, detecting and treating them early can prevent further harm and improve health outcomes. Eye and pupil movements offer a non-invasive, objective measurement of brain function, acting as a complement to structural imaging techniques.

MEASURING BRAIN FUNCTION BY ANALYZING EYE MOVEMENTS

Award-winning company machineMD, has developed neos[®], a groundbreaking measurement device that is set to democratize the field of neuro-ophthalmology. neos[®] is the result of a collaboration between machineMD, CSEM, and other partners, including clinicians. The device measures eye and pupil movements by leveraging the latest technological advances in eye tracking via a virtual reality (VR) headset, combined with machineMD's proprietary examination protocols. The industry-leading, commercially available VR headset displays visual stimuli and captures gaze position, pupil size, and other clinically relevant parameters.

Decades of clinical research and peer-reviewed publications show the link between eye movements and neurological disorders, including multiple sclerosis and Parkinson's disease. As the basic circuitry of visual- and oculomotor processing is well known, a targeted examination of eye and pupil movements may allow the precise localization of lesions within it. These changes hold potential as digital biomarkers of brain diseases. By providing neurologists and ophthalmologists with standardized and quantitative eye movement data through non-invasive examinations, machineMD steps closer to its objective to improve clinical accuracy for diagnosis and monitoring of people living with neurological disorders.

HOW CSEM ENHANCED THE EYE TRACKING PERFORMANCE OF NEOS[®]

As neos[®] is based on a commercial VR headset, it was adapted to enhance its eye tracking performance, even for people with imperfect vision. "CSEM developed specialized algorithms that use computer vision and machine learning techniques. To obtain the levels of accuracy needed, the system is now calibrated to each person's morphology," explains Andrea Dunbar, Business Developer for Data and AI at CSEM.

"Thanks to CSEM, neos[®] stands out with its custom eye gaze calibration technology, which enhances accuracy and surpasses default calibration by up to 16%. The solution's scalability and flexibility cater to diverse customer needs, while its robustness in handling variations in eye morphology and texture ensures reliability," confirms Dominic Senn, CEO of machineMD.

NEOS[®] MAKES NEURO-OPHTHALMOLOGY MORE ACCESSIBLE AND EFFECTIVE

neos[®] is launching in Switzerland, the United Kingdom and the United States of America, where it will democratize the field of neuro-ophthalmology by providing a tool for systematic eye movement examinations to medical professionals. "neos[®] is a non-invasive medical device which standardizes eye exams that are highly relevant to neurologists, ophthalmologists, and optometrists. neos[®] provides a fast, automated, and quantitative assessment of eye movements and pupillary function using VR-based eye tracking, including 8 tests in just 12 minutes. In addition to the benefits for healthcare professionals, our head-mounted solution enables greater patient comfort during examinations," concludes Senn.

“CSEM was the ideal partner for our MedTech project. They have expertise and experience in eye tracking that surpasses many academic partners. They delivered high-quality results on time and within budget and adapted to our changing needs. Thanks to CSEM, we achieved our product development goals and neos[®] is now a reality.

Dominic Senn
CEO • machineMD

Dynamic formulation: A breakthrough in bioprinting for regenerative medicine

BIOPRINTING: A GAME-CHANGER FOR REGENERATIVE MEDICINE

Bioprinting is a cutting-edge field of additive manufacturing that uses digital files to create biological tissue construct layer by layer. It has a wide range of applications across various fields, including tissue engineering, regenerative medicine, and drug discovery. Bioprinting has a huge impact on regenerative medicine, as it enables the fabrication of tissue models with a higher level of complexity that could replace damaged or diseased tissues in the future. Additionally, it offers advantages over conventional methods of tissue engineering, such as higher resolution, better control over cell distribution and orientation, and reduced time, costs and waste.

A NOVEL BIOPRINTING TECHNOLOGY BASED ON MICROFLUIDICS

CSEM has collaborated with REGENHU, a leading company in bioprinting, to develop a novel bioprinting printhead that allows dynamic formulation. This means that the material composition can be varied during the printing process, with real-time component mixing or the introduction of gradients for better biological mimicry.

A key component of this technology is a microfluidic chip developed by CSEM. This chip allows precise deposition of biomaterials and cells to create functional tissues and organs-on-chips. "Our disposable microfluidic chip enables dynamic formulation and handles live cells, maintaining them viable and in suspension. It can efficiently mix fluids and low-viscosity materials with cells with low waste to enable the printing of live tissues. Also, the microfluidic chip integrates co-extrusion functionality for core-shell bioprinting. Microfluidics technology is therefore instrumental in overcoming significant obstacles in bioprinting," says Stéphanie Boder-Pasche, Senior Project Manager for Cell Microtechnologies at CSEM.

A COMPETITIVE EDGE FOR REGENHU

Caio Valeriano, Sales Manager at REGENHU explains that: "With the Dynamic Formulation Module (DFM) we position ourselves as the innovative pioneer and leader in the bioprinting market. The ability to control in real-time the material composition and also to produce coaxial fibers is unique and this opens up new possibilities for creating more realistic and functional tissue models. This is possible thanks to CSEM's microfluidic chip."

A WIN-WIN COLLABORATION FOR SOCIETY, THE ECONOMY, AND THE ENVIRONMENT

Through the development and application of this cutting-edge bioprinting technology, REGENHU and CSEM have forged a mutually beneficial collaboration with extensive impacts. "The DFM will revolutionize the landscape of tissue engineering and regenerative medicine, bringing significant advancements in the research on vital tissues such as cartilage, skin, and heart. Moreover, its impact also reaches drug discovery by enabling the creation of in vitro tissue models with a higher level of complexity, holding the potential to better predict responses to drugs, contributing to shortening the time for new drug discovery, and also reducing the need for animal testing. The advantages offered by this technology are numerous, and we firmly believe that it will make a profound impact on shaping the future of medicine," confirms Valeriano. Furthermore, the synergy of bioprinting and microfluidics is advancing more sustainable and ethical practices by diminishing our dependence on animal organs, reducing transplant rejection risks, and offering more reliable tissue construct models.

“CSEM's expertise was fundamental in our project to develop an innovative bioprinting technology for multi-material printing. Their valuable support in the field of microfluidics helped us make a significant leap in our capabilities. The co-development of the Dynamic Formulation Module (DFM) has helped us broaden our product portfolio and increase our market presence.

Caio Valeriano
Sales Manager • REGENHU

Tissot's T-Touch Connect Sport: A fusion of style and fitness tech



“The synergy between CSEM and Tissot is one of the essential pillars of our success. The strong partnership between our two companies has always been fruitful, with concrete results in terms of technological advances in our products. We are convinced that the high-quality algorithms provided by CSEM will be highly appreciated by sportsmen and women, embodying the values of excellence and innovation that are at the heart of our commitment to our customers.

Sylvain Dolla
CEO • Tissot

A WATCH THAT CAN MONITOR HEART RATE, SPEED, AND ENERGY EXPENDITURE

Tissot's latest creation, the T-Touch Connect Sport, stands at the intersection of style and fitness tech, a significant advancement in the realm of connected watches. This sports model not only inherits the brilliance of its counterpart, the T-Touch Connect Solar, but goes a step further by incorporating CSEM-developed, clinically validated proprietary algorithms and photoplethysmography (PPG) optical sensors. These components allow the watch to monitor its wearers' fitness indicators, including heart rate, speed, and energy expenditure, enabling them to track and monitor their performance in real time.

The T-Touch Connect Sport is not just a new product; it represents a successful tech transfer, a testament to CSEM's mission. Leveraging CSEM's two decades of expertise in optical-based wearables and associated algorithms, Tissot has seamlessly integrated this cutting-edge technology into its production-ready product. The result is a perfect combination of classic watch design and wellness features.

OVERCOMING THE CHALLENGES OF OPTICAL SENSOR INTEGRATION

However, integrating an optical sensor into the watch's classic design presented challenges: "The real hurdle emerged in motion artifacts, the unwanted electrical input that can be induced by physical movement of the body and the measurement system. Given the watch's intended uses, including during running and workouts, it was crucial to ensure that these artifacts did not compromise the accuracy of the fitness measurements," explains Jens Krauss, VP Business Unit Leader of MedTech at CSEM. "CSEM's dedicated efforts to recalibrate algorithms based on raw optical signals from Tissot watches resulted in a hybrid model, combining GPS data with 3D accelerometer signals for accurate speed readings."

A REMARKABLE BATTERY LIFE WITH ULTRA-LOW-POWER TECHNOLOGY

The success of the T-Touch Connect Sport extends beyond fitness monitoring features. CSEM's clinically validated PPG optical sensors and algorithms, coupled with the watch's ultra-low-power SwALPS operating system and photovoltaic charging system (both previously co-developed by CSEM for the T-Touch Connect Solar), contribute to its remarkable three-month battery life in connected-sport mode. This sets Tissot apart from competitors, emphasizing the effectiveness of its collaboration with CSEM in delivering both style and substance in wearable technology.

A SUCCESSFUL COLLABORATION BETWEEN TISSOT AND CSEM

Tissot and CSEM's symbiotic partnership exemplifies innovation in the evolving landscape of wearables. The T-Touch Connect Sport not only makes a style statement, but also serves as a testament to how technology can seamlessly blend into our lives, enhancing both aesthetics and performance functionality.

Solar brilliance, Freesuns, and CSEM illuminate the future

In a dynamic partnership with Freesuns, CSEM has been at the forefront in developing a groundbreaking generation of Building Integrated Photovoltaic (BIPV) solar roof tiles. These tiles serve a dual purpose: not only do they enhance building aesthetics, but they also significantly increase durability and strength. The impact of this technological leap extends far beyond individual rooftops—it shapes a more sustainable future for all.

The tiles play a pivotal role in reducing carbon emissions and our overall environmental footprint. By capturing the Sun's energy, they contribute to a greener planet. "The tiles boast a minimum degradation ratio and a more robust life span (at least 25-30 years). Rigorous accelerated aging testing, including exposure to harsh environmental conditions and extreme temperatures ensures compliance with stringent IEC quality standards," says Matthieu Despeisse, Group Leader of Sustainable Energy at CSEM.

Freesuns' commitment to affordability is transformative, explains John Morello, CTO at Freesuns: "With these latest developments, we can reduce the selling price of our latest product, helping to broaden access to solar energy. Its adaptability—fitting any roof shape, color, or size—makes it an attractive option, even for buildings constrained by heritage or architectural considerations. Communities previously hindered by restrictions now have a viable path to sustainable power."

These joint efforts are set to yield impressive results. Freesuns' latest product will enhance its new customers' installed power capacity by 15%, accelerating the production of clean energy. This contribution brings Switzerland's renewable energy goals closer, pointing the way toward a resilient and cleaner future.



The spring revolutionizing industrial efficiency



At the core of Federnfabrik Schmid AG's i-spring® lies CSEM's unparalleled expertise in sensing systems. By seamlessly integrating sensors with a physical spring, CSEM has empowered Federnfabrik Schmid to create an embedded self-monitoring and communicating spring. This intelligent device significantly enhances the reliability and safety of springs by identifying potential issues and enabling proactive, predictive maintenance, resulting in reduced downtime and generating cost savings. Additionally, it collects valuable data for condition monitoring.

CSEM infused the i-spring® with digital features using low-power embedded sensors and electronics that monitor the strain applied to the spring. As a result, the i-spring® wirelessly transmits its real-time status, using an energy-efficient and data-smart approach.

"Our sophisticated software and aging algorithms are also a driving force behind the i-spring®. The algorithms know how to prioritize tasks, ensuring everything gets a fair share. The spring itself becomes a manager, handling its own duties efficiently and reliably, and our software allows operators to view the spring's health status on their smart devices," says Cédric Hennemann, Project Manager for Integrated and Wireless Systems at CSEM. Additionally, CSEM's contribution to the miniaturization of the sensor antenna—a critical component ensuring seamless wireless communication—was instrumental in its success.

Beyond its digital capabilities, the i-spring® also brings both safety and environmental advantages. By preventing spring failures, it reduces the risks of work-related accidents, helps minimize downtime, and lowers costs by cutting waste, thereby reducing companies' ecological footprint.

“CSEM's mastery in electronics, radio frequency, software, and firmware together with Federnfabrik Schmid's extensive spring know-how and customer knowledge transformed a simple mechanical component into a smart, efficient, and forward-thinking solution. The i-spring® is proof of Swiss ingenuity and collaborative excellence.

Albert Enste
CEO • Federnfabrik Schmid

Corporate highlights



CSEM'S DAYCARE CELEBRATES ITS 20TH ANNIVERSARY

In 2003, CSEM opened a daycare facility next to its site in Neuchâtel, becoming the first private company in the Canton of Neuchâtel to offer childcare to its employees. Today, this heartwarming initiative also embraces the wider community, providing crucial support to working parents.

In the opening year of daycare, CSEM employed around 266 staff members. Just five years later, in 2008, this number rose to 380 highly trained employees. This led CSEM to implement a family-friendly and work-life balance policy, aimed at both men and women, and supported at the highest level.

Concrete actions in the policy included encouraging parents to flourish both in their day-to-day work and in their family life, with access to company daycare, part-time positions of responsibility, remote working, job sharing, flexible working hours, unpaid leave, and paid leave for family responsibilities. By 2008, this policy had helped CSEM become the first small-to-medium-sized enterprise (SME) in French-speaking Switzerland to be awarded the "equal-salary" label by the Swiss Association of Commercial Employees.

Since 2023, CSEM has expanded its policy to be more inclusive. It now offers 15 days of paid paternity leave and adoption leave for all employees, among other benefits. And it provides monetary stipends for daycare to its employees who are not based at its Neuchâtel site. On average, the retention rate for employees with permanent contracts at CSEM is 8.25 years, and for all employees (including non-permanent contracts, trainees, post doctorates, PhDs, etc.), it is 7.15 years. This demonstrates the effectiveness of CSEM's policies geared towards its employees' well-being and work-life balance.



SHOWCASING THE POWER OF ORGAN-ON-CHIP AND ORGANOIDS

CSEM is a leader in microphysiological systems, organ-on-chip (OOC), and organoids, which are realistic and human-relevant models of organs and tissues. It has developed and implemented innovative technologies and solutions for biomedical research and drug development in these areas. It has also created a collaborative network of stakeholders from academia, industry, and healthcare, who share its vision and mission.

A highlight of CSEM's activities is the Next Gen OOC & Organoids event. It brings together the best minds and most cutting-edge technologies in this field. Over two days in 2023, it attracted 350 participants, covering topics such as automation or sex differences in cellular responses and drug effects. This is a key aspect of personalized medicine, as male and female cells show contrasting physiologies, reacting differently to various stimuli and drugs. By using OOC and organoids, scientists can better understand and account for these differences, leading to more effective and safer treatments for both sexes.

By hosting this event, CSEM shows its commitment to promoting the benefits of preclinical in vitro models to the world. OOC and organoids offer many advantages over traditional methods of biomedical research, such as animal testing. They are more ethical, accurate, cost-effective, and sustainable. They also enable the exploration of new frontiers in human health and disease, such as organ regeneration, disease modelling, and drug screening. CSEM is at the forefront of this exciting and promising field and aims to make a positive impact on society by developing innovative solutions for personalized medicine, drug testing, and tissue engineering.



CSEM DRIVES INNOVATION AND COLLABORATION IN CENTRAL SWITZERLAND

CSEM is a key player in the innovation ecosystem of Central Switzerland, offering cutting-edge technologies and solutions in various domains, such as personalized health, Industry 4.0, and artificial intelligence. The company presented its latest achievements and collaborations at its technoVation event in June 2023 at KKL Lucerne, where more than 200 participants learned how CSEM can help them tackle their current and future challenges with its know-how and technologies.

One of CSEM's main strengths is its ability to build and maintain strong relationships with its partners and customers, from start-ups and SMEs to large corporations and public institutions. The technoVation event showcased several examples of successful cooperation and co-creation, demonstrating how CSEM's technologies can improve the competitiveness and innovation potential of its partners and customers. For example, CSEM has developed a powerful, AI-based identification system for aluminum profiles for E. Luterbach AG and supported start-ups in the MedTech and Life Science domain on their way to develop marketable products. These include Zynnon AG for safety and diagnostics in hospitals and Deep Breath Intelligence AG for patient's breath analysis.

These are just some of the cases where CSEM has applied its technologies to create value and boost impact for its partners and customers. The technoVation event was also a platform for networking and dialogue among participants, featuring keynote speeches from prominent figures in the fields of science, technology, and society. It was a clear expression of CSEM's vision to be an innovation factory for Switzerland, where technology meets society and where innovation is driven by collaboration with industry.



BERN'S MEDTECH SECTOR GETS A BOOST FROM CSEM'S EXPERTISE AND NETWORK

The Canton of Bern is on a mission to become a leading international medical hub by 2030. To achieve this, it has brought the Inselspital, University Hospital Bern, the University of Bern (UniBE), and CSEM together in a powerful alliance of medical and microengineering expertise. CSEM brings its experience and know-how in developing and applying new sensing and processing technologies and artificial intelligence solutions in the medical field. The collaboration between these partners has sparked high interest among key medical professionals.

In 2023, the initiative kicked off 10 clinical research projects. For the year 2024, a panel of 22 medical-technology experts allocated the annual funds of 2 million Swiss Francs to be split between 8 additional projects. In total since its inception, this collaboration has supported 24 different projects spanning fields such as pneumology, cardiology, surgery, neurology, oncology, diabetology, and women's health. These projects aim to help medical professionals with new tools and methods for diagnostics and therapy optimization, enhancing patient care and monitoring. Many are now undergoing clinical trials.

The alliance is on track to make the Canton of Bern a promoter of innovation, creating more jobs and opportunities for local industrial businesses and start-ups, as well as attracting international talent and investment. In line with its mission of technology transfer to industry, and more specifically to the MedTech sector, CSEM has established a base at the Sitem Start-up Club in Bern.

Corporate highlights



NEW START-UP ALIGNS INDUSTRIAL DESIGN AND USER EXPERIENCE FOR INNOVATIVE PRODUCTS

In our daily lives, we come across numerous products that are functional and durable. However, they often lack user-friendliness and aesthetic appeal. These shortcomings present challenges to manufacturers, who must carefully navigate technical specifications, economic viability, and product scalability. Enter Ekio, a fresh CSEM start-up that empowers its clients to overcome these obstacles. Ekio harmonizes industrial design with user experience, enabling clients to create products that not only meet technical requirements, but also deliver a positive and satisfying user experience.

Ekio was founded by Mathilde Crettaz (formerly of CSEM) and Bastien De Marco (formerly of CSEM spin-off Aktiia), who have extensive expertise in technical design and industrialization, especially for medical products. They apply their design and development skills to clients' projects from the start, before handling and helping with industrialization and production line set-up. This ensures that their clients' products are usable, desirable, and feasible.

"Ekio shares CSEM's vision to be an innovation booster for the Swiss industry landscape by championing technically sound, sustainable, and customer-centric design. Ekio is looking forward to collaborating with other innovative and visionary companies and start-ups, especially in the medical and health sectors, to help them design products and solutions that make a difference in people's lives," concludes Crettaz.



INVENTOR AWARD HONORS BREAKTHROUGH IN BLOOD PRESSURE MONITORING

Monitoring blood pressure at home can be a hassle as conventional cuff devices are often cumbersome, making them difficult to use. But what if you could measure your blood pressure with just a small optical sensor on your finger or wrist, or through your smartphone? This is the breakthrough achieved by four scientists, who won the CSEM's 2023 Inventor Award for this patented innovation.

Their technology is based on an innovative optical sensor that detects the changes in arterial volume due to blood pressure combined with an algorithm that calculates accurate systolic and diastolic values. This technology both revolutionizes the diagnosis and management of blood pressure disorders and promotes the four Ps of medicine: predictive, preventive, personalized, and participatory. Non-invasive and comfortable, it has been clinically validated and adopted by several companies.

The jury praised the positive societal impact of this invention, as hypertension is a major risk factor in cardiovascular diseases and deaths. Alexandre Pauchard, CEO of CSEM: "Our Inventor Award highlights our collaborators' innovative and disruptive ideas. The invention and work of this year's award-winning team were particularly remarkable, as they generated significant value for our customers and helped create more than 60 high-value-added industrial jobs."

CSEM's Inventor Award was created to stimulate staff members' creativity and inventiveness. The winners of the award were: Martin Proença, Josep Solà, Mathieu Lemay, and Christophe Verjus.



PIONEERING SOLUTIONS FOR SPACE EXPLORATION AND BEYOND

CSEM has been at the forefront of space technology development in Switzerland since the late 1980s. From satellite technology enhancing our daily lives to the development of materials and technologies used in medical devices, benefits generated by the space industry extend far beyond the cosmos. They have the potential to create economic opportunities and jobs while addressing some of our planet's most urgent challenges—climate change and disaster prevention spring to mind.

Underscoring this, CSEM hosted two esteemed guests in December 2023: Dr. Thomas Zurbuchen, NASA's longest-serving Head of Science, and Claude Nicollier, the first Swiss citizen in space. They engaged in a stimulating dialogue with Alexandre Pauchard and Andreas Rickenbacher, CEO and Chair of the Board of Directors of CSEM respectively, about innovation in the European space sector. Dr. Zurbuchen regards innovation highly as a means to tackle unresolved global challenges. His perspective underscores the vital role of the space industry, which not only catalyzes significant technological breakthroughs, but also fosters developments that have a broad and positive impact on various aspects of everyday life.

CSEM has been instrumental in several pioneering projects for the European Space Agency (ESA) and beyond. From the early 2000s, the organization has been supplying Corner Cube Mechanisms for the Metop and MTG satellites, significantly enhancing the dependability of weather forecasts. In 2022, CSEM played a key role in the development of the CLUPI camera system on the ExoMars rover, which is expanding our understanding of Mars and the possibility of life there. Additionally, CSEM's ultra-high stability laser metrology has been crucial for the LISA gravitational wave observatory, a joint project between ESA and NASA, poised to offer new insights into the Universe. CSEM is pushing the boundaries of human knowledge with its precision engineering solutions.

“At CSEM, we don't just follow technological trends, we help shape them and set new standards. We bridge the gap between foundational research and market-ready products, fostering innovation across multiple industries for the benefit of the Swiss economy.”

Alexandre Pauchard
CEO

CSEM's environmental impact with our industry partners

Governance

- Code of conduct
- ISO certification since 1998
- Artificial intelligence policy

Dedicated teams

- Sustainability
- Diversity & inclusion
- Work-life balance

Strategic initiatives

Continuous investments in new infrastructure and buildings

Results

Energy consumption per FTE *: -42.5% in 7 years

Carbon footprint per FTE *: -26.5% in 7 years

* Full-time employee

1. Industry 4.0
Edge computing, AI, predictive solutions, efficiency improvement.

2. Sustainable electronics
Ultra-low-power technologies, energy harvesting, environmental preservation.

3. Agriculture
Tech solutions for resource management and ecosystem conservation.

4. PV technologies
High-efficiency solar cells and modules, aesthetical integration, BIPV, climate change mitigation.

5. Digital energy
Smart energy grid solutions, data science, secure IoT systems, photovoltaic power forecasting.

6. Batteries
Smart, sustainable batteries with intelligent management for reduced environmental impact.

7. E-mobility
Eco-friendly mode of transportation through customized lightweight and flexible photovoltaic solutions.

8. Water
Water resource sustainability, safety solutions, AI for management insights.

9. Disaster prevention
Weather forecasting improvement, water flow monitoring, natural disaster risk reduction.

CSEM's environmental impact and efforts

We are always looking for ways to reduce our environmental impact from the inside out and beyond our operations. Between 2015 and 2022, CSEM achieved significant progress, cutting each full-time employee's carbon dioxide footprint by 26.5% in total. However, there is still more we can do. We remain committed to continuous improvement in our environmental and sustainable performance and will continue to invest in sustainable practices, technologies, and solutions that can help humanity face the challenges of our times. With our partners and clients, we are working to reduce environmental impact across various sectors.

1. INDUSTRY 4.0

CSEM applies edge computing and predictive solutions to reduce the environmental footprint of industrial processes. Edge computing means processing data at the source rather than sending it to a remote data center. This reduces the latency, bandwidth, and energy consumption of data transmission, as well as demand for large-scale, energy-hungry data centers that produce greenhouse gases. Predictive solutions use artificial intelligence (AI) and machine learning to optimize industrial processes such as production, maintenance, and quality control. This improves efficiency, reduces waste, and lowers emissions.

2. SUSTAINABLE ELECTRONICS

Our ultra-low-power technologies are designed to minimize energy consumption, thereby reducing the environmental impact of electronic devices. Ultra-low-power means that our devices can operate with tiny batteries or harvest energy from their surroundings. This reduces the need for frequent battery replacement or recharging, which saves resources and lowers greenhouse gas emissions. Our solutions are also optimized for performance and functionality, using advanced microelectronics, sensors, and wireless communication. By enabling smart and connected applications, such as IoT, wearables, and biomedical devices, we can improve the quality of life and health of people, while helping to preserve the environment.

3. PV TECHNOLOGIES

Solar energy is a key renewable energy source that helps fight climate change. Solar photovoltaic technology has become more efficient and affordable in recent years, making it a viable and scalable energy option in many countries. We partner with leaders like Meyer Burger, 3S Swiss Solar Solutions, Freesuns, and Tissot, who excel in making solar cells and modules, integrating photovoltaics into buildings, creating solar tiles and applying PV to other areas such as watches. Together, we create innovative solutions that blend performance, aesthetics, functionality, and sustainability. Examples include high-efficiency solar modules, colored solar roofs, and watches powered by solar energy. These solutions can produce clean energy, conserve resources, and reduce emissions, while adding value and appeal to buildings and products.

4. AGRICULTURE

With its European and Swiss partners, CSEM is developing technology for eco-friendly agriculture and forestry. InsolagrIn, inSOLIGHT's agrivoltaic solution, uses transparent solar modules and optical layers co-developed with CSEM to control light, enhance plant and water efficiency, and produce clean electricity. CSEM and Voltiris are also working on new PV technologies for greenhouses, using transparent solar modules and optimal solar energy collection for green and profitable outcomes. AGRARSENSE is an EU project aiming to develop innovative technologies for agriculture and forestry, as well as water monitoring with the help of CSEM's expertise in microelectronics, photonics, and electronic packaging. These technologies will enable smart and sustainable management of resources and ecosystems.

5. DIGITAL ENERGY

CSEM offers smart energy grid solutions, leveraging its know-how in solar photovoltaics, data science and machine learning, building energy management, and secure IoT systems. We have delivered successful outcomes for various research and industrial projects, such as a machine learning solution for precise photovoltaic power production forecasting. Moreover, our partnership with Proxima Solutions (now part of DNV) has led to AI algorithms for predictive maintenance of wind turbines. These innovations boost the reliability, efficiency, and sustainability of renewable energy sources, while reducing operational costs and environmental impact.

6. BATTERIES

Through its Battery Innovation Hub, CSEM collaborates with industry partners such as Blue Solutions to improve the efficiency, safety, and lifespan of solid-state lithium batteries. These have a lower environmental impact than conventional batteries, as they consume fewer resources and emit less greenhouse gases. We also create intelligent battery management systems and storage that use sensors and algorithms to optimize the performance and lifespan of battery packs. By innovating in the battery domain, CSEM contributes to reducing the environmental footprint of various applications, from electric vehicles to smart grids.

7. E-MOBILITY

Our goal is to make vehicles more eco-friendly by integrating photovoltaic systems into them. These systems use solar modules that are lightweight, flexible, and durable. They can fit different shapes and surfaces of the vehicle body, such as the roof, hood, or doors. They generate electricity from sunlight, which can be used to power auxiliary systems such as air conditioning, lighting, or refrigeration. They can also support the main propulsion system, reducing the need for fuel.

We have partnered with Simoldès and Swissairtainer, who are experts in vehicle parts manufacturing and temperature-controlled pharma airfreight solutions, respectively. With them we have integrated PV into the car's bodywork, using lightweight and flexible solar cells, and have helped develop smart containers that can regulate the temperature and humidity of pharmaceutical products during air transport.

8. WATER

We develop solutions to ensure the safety and sustainability of water resources, such as water monitoring, disposable sensors, cell-based microsystems, and self-calibrating devices. We use these solutions to measure various parameters of water quality, such as pH, ions, heavy metals, bacteria, and toxins. We also apply artificial intelligence algorithms to analyze the data and provide insights for better water management. CSEM has equipped the City of Lausanne's video sewer robots with sensors and algorithms to save resources on human intervention and streamline inspection, enabling the automatic detection of damage to pipes.

9. DISASTER PREVENTION

We are improving weather forecasting and monitoring water flow with Meteosat and Precidata in order to mitigate the environmental impact of disasters. Meteosat satellites are essential to weather forecasting accuracy, as they provide imagery for the early detection of fast-developing severe weather, such as storms or heavy fog. With Precidata we have developed a solution to measure water flow and precipitation with radar sensors, providing high-resolution and real-time data for hydrological modelling and flood risk assessment. These technologies enable us to reduce the risks and damage caused by natural disasters and enhance community resilience.

Financial report

Positioned as a transmission belt between the academic world and industry, CSEM recorded significant new growth over the past year (+7.1%). Several factors fueled this progress, especially the inauguration of a site dedicated to MedTech activities, co-financed by the Canton of Bern, as well as an increase in support from the Swiss Confederation. Together, these generated four growth points. Despite political obstacles between Switzerland and Europe, the relevance of CSEM's themes and the recognized skills of its teams opened doors to many new European projects, generating a 25% increase in revenue from this source. Although industrial mandates have progressed at a slower pace, the total volume has reached an unprecedented level of 34 million Swiss francs.

The increase in personnel costs (+7.1%) reflects the growth of the teams, driven by the opening of the Bern site and the rapid deployment of our Battery Innovation Hub in Neuchâtel. Other operating expenses have also evolved in line with our development.

The robustness of the balance sheet allows us to view the coming years, a feature of which could be high-level consolidation, with serenity.

Key figures

	2023	%	2022	%
Total revenues (CHF)	107 631 901	100	100 453 594	100
Public contributions	44 878 300	42	40 607 000	41
Competitive public research funds	28 816 435	27	26 330 562	26
Private contributions	33 937 166	31	33 516 032	33
Total operating expenses (CHF)	107 333 240	100	100 140 580	100
Expenses directly related to projects	12 987 619	12	13 896 590	14
Staff costs	71 958 481	67	67 168 590	67
Operating costs	22 387 140	21	19 075 400	19
Operating result (CHF)	298 661		313 014	
Non-core activities	- 203 856		- 209 841	
Result for the period (CHF)	94 805		103 173	

Auditors PricewaterhouseCoopers SA Neuchâtel, Switzerland

Non-consolidated figures



Organization

Board of Directors

Claude Nicollier Chairperson, until June 9, 2023

Andreas Rickenbacher Chairperson, since June 9, 2023

Jacques Baur Vice Chairperson, Fondation en faveur d'un laboratoire de recherches horlogères (FLRH)

Didier Boillat City of Neuchâtel

Pierre-André Bühler Fondation en faveur d'un laboratoire de recherches horlogères (FLRH)

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Jérôme Faist Swiss Federal Institute of Technology Zürich – ETHZ, until June 9, 2023

Josette Frésard Viteos SA

Crystal Graf Canton of Neuchâtel

Rachel Grange Swiss Federal Institute of Technology Zürich - ETHZ, since June 9, 2023

Olivier Greim Rolex SA

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Ursula Oesterle École polytechnique fédérale de Lausanne – EPFL

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Vice President of CSEM sites



Véronique Leresche-Roy
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CSEM
info@csem.ch
T +41 32 720 51 11

DESIGN

Contreforme

WRITING

CSEM

EDITORIAL SUPPORT

Ray Lancaster

PHOTOS

CSEM

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Guillaume Perret

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p. 18

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p. 22

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p. 24

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p. 34

Guillaume Perret

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version



ALLSCHWIL

Hegenheimermattweg 167A
CH-4123 Allschwil

ALPNACH

Untere Gründlistrasse 1
CH-6055 Alpnach

BERN

Weyermannsstrasse 36
CH-3008 Bern

LANDQUART

Bahnhofstrasse 1
CH-7302 Landquart

NEUCHÂTEL

Jaquet-Droz 1
CH-2002 Neuchâtel

ZÜRICH

Technoparkstrasse 1
CH-8005 Zürich

www.csem.ch
info@csem.ch

