



Health

Automated Optical Blood Pressure Monitoring One CSEM Technology, Two Innovative Start-ups



One Societal Challenge: The World Health Organisation estimates that **1.28 billion people aged 30 to 79 suffer from hypertension**, costing global healthcare systems **\$370 billion US** annually



One Innovation: An **automated Optical Blood Pressure Monitoring Technology** to improve hypertension treatment



AKTi!A



A **cuffless optical blood pressure monitor integrated into a bracelet** and supported by an app, which provides 24/7 readings for continuous tracking and easy consultation, helping millions at risk from untreated hypertension



"After 15 years in development, at CSEM the prestigious Swiss Research & Development Center, and almost two million blood pressure readings, Akti!a has cracked the code to bring to market **the world's first automated 24/7 blood pressure monitoring system.**"

CE 96% 27

Approved Medical Device CE Mark Class IIa of Patients prefer Akti!a Bracelet over a traditional cuff Average number of Blood Pressure measurements per day

Mattia Bertschi, Akti!a's COO

Two Start-ups



"The blood pressure measurement hadn't changed in over a century"



biospectral



OptiBP™, a **CE-approved app** to measure blood pressure via smartphone using a **fingertip on the camera**, making it the **world's first clinically certified blood pressure monitor app**



"CSEM has experience working with the watchmaking industry and is a world-leading expert in oscillator systems. **That's where you go when you are seeking technologies that break the mold.**"

Prof. Patrick Schoettler, CMO, Biospectral

A CSEM Technology

Two Start-ups created



Sustainable Development Goal 3

Ensure healthy lives and promote well-being for all at all ages

Automated Optical Blood Pressure Monitoring

One CSEM Technology, Two Innovative Start-ups

Technological Advancements



Development of **PPG techniques to analyze arterial diameter changes per heartbeat**, leading to Optical Blood Pressure Monitoring (oBPM) via pulse wave analysis (PWA) after testing a dozen techniques

2004
-
2011

2011
-
2017

2017

Technology Transfer & Startup Launches



2017: Launch of Biospectal.
2018: Launch of Aktiia.

2020: CSEM and AKTIIA technology won an **EARTO Innovation Award 2020 prize** in the Impact Delivered Category

2017
-
2018



Industrial Development

Aktiia received regulatory approval for CALFREE™, a calibration-free optical technology using sensors in smartwatches or smartphone cameras. It received approval for **sales in over 40 countries**

Biospectal launched the public beta of OptiBP™ for Android in February 2024

2018
-
2023

2024



Research & Development



CSEM initiated research on non-invasive Photoplethysmography (PPG) for **continuous blood pressure monitoring**:

- 2004–2007: Developed the first multi-vital optical blood pressure approach (MiniNOB)
- 2007–2011: Focused on pulse wave velocity (PWV)

Regulatory Requirements Validation

CSEM ensures its solutions meet the **highest medical standards**, complying with ISO-13485 (quality management) and ISO 81060-2 (accuracy)



Clinical Validation & EU Market Introduction

2018–2020 Clinical Studies: Aktiia's oBPM™ system validated in Blood Pressure Monitoring

Regulatory Approvals:

- Aktiia received CE mark approval for European market access
- Biospectal's OptiBP™ obtained certification for optical fingertip BP



"The development of optical blood pressure monitoring started about 20 years ago at CSEM, and in 2001, we developed and patented our first solution and algorithm for optical heart rate measurement."

Jens Krauss, VP Medtech, CSEM

The RTO CSEM was the place where:

- The Research and Development took place to **mature the technology** (2004 – 2017)
- **Two start-ups were created** as a result of one RD&I activity

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AKTi!A An Established Company

>300M

More than **300 Million Blood Pressure measurements to date**, the largest blood pressure data set in the world

>80K

More than **80 000 patients currently rely on Aktiia** for Blood pressure management and optimisation

35

The World's First Clinically Validated Optical Blood Pressure Technology (20+ clinical trials), **backed by over 35 patents**



Aktiia employs around 60 people, and the continued expansion of its technology is expected to stabilise and potentially increase employment opportunities



A Thriving Start-up

>851M

The global market size for disposable blood pressure cuffs was estimated at around **\$269 million in 2022 and will reach \$851 million by 2032**



Several **collaborations with industrial partners** such as connectedlife, FibriCheck, Thryve & Supported by **grants** from the Bill & Melinda Gates Foundation, Grand Challenges Canada and Innosuisse



Market Expansion: The Biospectal OptiBP for Android public beta is available now in the US, UK, France, Germany, Spain and Switzerland