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EQUITY RESEARCH

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Synchron

TEAM

Jan-Erik Asplund
Co-Founder
jan@sacra.com

Marcelo Ballve
Head of Research
marcelo@sacra.com

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Synchron

Visit Website

Developer of endovascular brain-computer interfaces enabling patients with paralysis to control devices using their thoughts

#brain-computer-interfaces

FUNDING

$145,000,000

2025

Details

HEADQUARTERS

Brooklyn, NY

CEO

Thomas Oxley

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Valuation

Synchron raised $75 million in a Series C round led by ARCH Venture Partners in December 2022, increasing total funding to $145 million. The round included new investors Bezos Expeditions and Gates Frontier, alongside existing investors Khosla Ventures, Greenoaks, and Reliance Digital Health.

Other investors from earlier rounds include Alumni Ventures, Moore Strategic Ventures, NeuroTechnology Investors, METIS, Forepont Capital Partners, ID8 Investments, Shanda Group, and the University of Melbourne. The company has received institutional support consistently from early-stage through growth rounds.

Product

Synchron is developing the Stentrode, an endovascular brain-computer interface that allows paralyzed patients to control digital devices through thought. The system includes a 16-electrode array delivered via the jugular vein into a blood vessel near the motor cortex, eliminating the need for open-brain surgery.

The procedure lasts approximately two hours and uses standard catheter lab equipment, with patients typically discharged within 1-2 days. The electrode array expands against the vessel wall to capture motor-intent brain signals.

These signals are transmitted through a lead to a matchbox-sized implantable pulse generator placed under the chest skin, which wirelessly sends data to a wearable device that connects via Bluetooth to smartphones, tablets, and smart home systems.

Patients complete 15-20 minutes of calibration using an onboarding wizard, enabling them to control cursors, type messages, and operate connected devices.

The system integrates with Apple's BCI protocol for iPhone and iPad control, Amazon Alexa for smart home commands, and OpenAI for voice-activated AI assistance. Users can activate the system with a thought-tap and perform digital motor functions such as clicking, swiping, and navigation.

Current performance supports typing speeds of 5-10 words per minute, providing patients with severe paralysis from ALS, stroke, or spinal cord injury the ability to regain digital communication and device control. The cloud-based software improves continuously through machine learning as more patients use the system.

Business Model

Synchron operates a B2B medical device model targeting hospitals and healthcare systems with an endovascular brain-computer interface. The company utilizes existing catheter lab infrastructure and interventional radiologist expertise, eliminating the need for specialized neurosurgical facilities or robotic systems used by competitors.

This approach allows for broader deployment across the global installed base of cardiac catheterization labs, drawing a parallel to the scaling of cardiac stents. The procedure employs standard interventional radiology tools and techniques, minimizing training requirements and facility modifications compared to craniotomy-based alternatives.

The business model is based on device sales, with projected average selling prices starting at approximately $60,000 for enabling BCIs, alongside ongoing software and support services. Synchron has acquired an equity stake in micro-fabrication firm Acquandas to maintain supply chain control for the ultra-thin nitinol electrodes essential to its vascular approach.

The company is developing a data feedback loop in which each patient session uploads neural and behavioral data to refine decoding models, enhancing system performance over time. This structure supports recurring software revenue and continuous product improvement as the user base expands.

The reimbursement strategy prioritizes evidence of functional independence gains and improvements in activities of daily living, aligning with existing healthcare economics related to assistive technologies and long-term care cost reduction.

Competition

Invasive high-bandwidth systems

Neuralink develops a high-channel-count intracortical system with 16,000 electrodes and full vertical integration, including custom chips and surgical robotics. The company has implanted devices in multiple patients and demonstrated direct cursor control capabilities that currently exceed Synchron's performance. However, the requirement for craniotomy and specialized robotic insertion increases procedural risks and limits the pool of qualified surgeons.

Paradromics is working on a 65,000-channel system with separate cranial and chest components, targeting high-bandwidth applications. The company has completed its first temporary human implant and is preparing for clinical trials. Blackrock Neurotech, with over 30 subjects implanted using its Utah arrays, has the longest clinical history in the space, though its systems feature lower channel counts compared to newer entrants.

Minimally invasive alternatives

Precision Neuroscience, founded by former Neuralink executives, is developing ultra-thin cortical surface films inserted through small skull openings. Its Layer 7 system, targeting 1,024 channels, completed its first human implants in 2024. This approach directly competes with Synchron's less-invasive positioning while potentially offering higher resolution than endovascular placement.

The competitive landscape reflects a trade-off between invasiveness and performance. Synchron's endovascular approach minimizes surgical risk but currently supports fewer channels and requires eye-tracking assistance for some functions. Direct cortical placement offers higher bandwidth but introduces greater procedural complexity and associated risks.

Platform and integration players

Consumer technology integration is emerging as a differentiator as companies work to connect BCIs with mainstream devices. Apple has incorporated dedicated BCI protocols into iOS, with Synchron as the first implementation partner. Amazon's Alexa integration and partnerships with Nvidia for AI processing create ecosystem advantages that pure-play BCI companies must address.

The rise of comprehensive neurotech platforms poses a challenge to companies focused solely on implant hardware. Firms developing full-stack solutions, from electrodes to applications, may capture more value than those specializing in individual components.

TAM Expansion

Indication expansion

The upcoming trial will include stroke patients and broader motor impairment conditions beyond the initial ALS focus. Stroke paralysis alone accounts for 5-7 times more annual candidates than ALS, increasing the addressable U.S. patient population from 30,000-40,000 to 250,000-300,000. Additional neurological conditions, such as multiple sclerosis, present further opportunities within the motor control indication.

Future bidirectional capabilities could target neuromodulation markets for depression, chronic pain, and epilepsy, collectively valued at over $10 billion. Synchron's equity stake in Acquandas supports the development of sensing-plus-stimulation versions, enabling competition in therapeutic neuromodulation rather than limiting applications to assistive technology.

Consumer technology integration

Integration with smart home and IoT devices via Amazon Alexa, Apple HomeKit, and Matter protocols allows Synchron to address adjacent markets in home automation and accessibility technology. OpenAI integration for conversational AI extends applications to augmentative and alternative communication needs beyond basic device control.

Compatibility with Apple Vision Pro and AR/VR platforms could facilitate entry into immersive computing and metaverse applications as these technologies evolve. Each new API integration, including Bluetooth, Matter, and Alexa Skills, expands the total addressable market in consumer electronics and smart home control.

Geographic and delivery expansion

International expansion through CE mark pathways could provide access to Europe’s 400,000 severe paralysis patients ahead of U.S. commercial approval. The online patient registry supports global screening and pipeline development in advance of country-specific regulatory clearances.

Home-based care models, enabled by smart home integrations, align with VA and CMS programs that fund assistive technology for independent living. These models create reimbursement opportunities outside traditional neurosurgery budgets and expand patient access through existing healthcare programs.

Risks

Bandwidth limitations: Synchron's endovascular approach provides lower signal quality and a reduced channel count compared to direct cortical interfaces, which may limit performance as competitors achieve higher cursor control and typing speeds. The single-tissue-layer separation from the cortex may not meet the demands of advanced applications as the market shifts toward higher-bandwidth requirements.

Regulatory pathway: The FDA approval process for Class III implantable devices is lengthy and unpredictable, with stringent safety requirements that could extend timelines beyond current estimates. Serious adverse events during the pivotal trial could delay commercialization and allow competitors with different risk profiles to gain an advantage.

Reimbursement uncertainty: Healthcare payers have limited precedent for covering brain-computer interfaces. The combination of high device costs and ongoing software service expenses presents significant reimbursement challenges. Without established coverage policies, patient access may remain restricted post-approval, limiting market adoption despite demonstrated clinical efficacy.

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