



Fraunhofer
IMS

**The future of medical human-technology
interaction**

**Visionary neural implants
from Fraunhofer IMS**



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Visionary neural implants

The future of medical human-technology interaction

The connection between the human nervous system and state-of-the-art technology is made possible by visionary neural implants. By detecting nerve impulses and targeted stimulation of individual nerves or brain regions, neurological diseases can be recognised and treated or prostheses can be controlled at will.

Fraunhofer IMS is your R&D partner

Drive fast, innovative product development together with us: We at Fraunhofer IMS offer consulting, studies, implementation and realisation of your ideas in research and development projects.



Our services for you

With our overall system knowledge, our team helps you to realise your ideas with state-of-the-art, implantable solutions.

Customised ASIC technologies:

- Discrete and integrated electronics for stimulation, data acquisition and neurostimulation
- Customised semiconductor circuits in 180 nm to 22 nm
- Optimisation of design in terms of area, energy requirements and performance
- One-chip integration of analogue and digital components
- Post-CMOS process for additional sensor integration

Ultra-fast wireless data connection:

- Power supply and data communication for battery-free sensor implants
- Highly customised communication in various frequency ranges, in real time and at high data rates
- Customised antenna and front-end design
- Development of the overall system, including external and internal electronics

Biocompatible coatings and electrodes:

- Long-term stability in biocompatible coating of active implants (passivation layers)
- Planar and 3D electrodeposition
- Design and integration of nano-/microneedles for selective stimulation, drug delivery and electrical recording
- Production of customised interdigital electrodes (IDEs) or arrays on silicon or glass wafers
- Monolithic structure / CMOS-compatible

Neurosignal processing:

- Software and hardware-based processing with neural networks
- Data processing in the implant to optimise data traffic and reduce energy consumption
- Customised algorithms on FPGA or microcontrollers
- Embedded AI for closed-loop approaches



We offer customised support
in the development of your
high-end system ideas.«

Prof. Karsten Seidl,
Head of Health

Neural implants: IMS is your R&D partner

Neural implants open up promising possibilities, not only as an alternative to existing treatments, but also as an opportunity for patients with previously untreatable diseases.

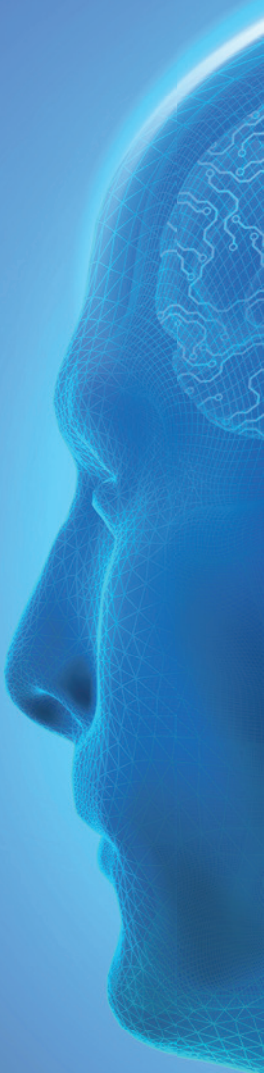
Let's work together to develop technologies that make a difference:

- **Holistic:** Fraunhofer IMS has decades of experience – from research to product approval. We provide you with support from the idea to the finished product!
- **Customised:** Do you have special requirements regarding the system or ASIC design? Please contact us.
- **Safe:** We have been certified according to DIN EN ISO 9001 since 1995 and can refer to many years of experience with ISO 13485 and IEC 62304.
- **Innovative:** Various research projects ensure that we at Fraunhofer IMS are always at the cutting edge of low-power, embedded AI and signal processing.

Find out more about neural implants, embedded AI, telemetry and other topics:



Contact



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