

Thomas RECORDING GmbH

Solutions for Neuroscience

Wireless AMEP System

16 channel wireless semichronic NHP recording system



- Up to **16** single microelectrodes
- Bidirectional moveable electrodes



Made in

GERMANY

REC

- Extracellular recording from head unrestraint non-human primates
- Wireless signal transmission
- Minimal tissue damage due to 100µm fiber electrodes
- Small size and very stable titanium recording chamber inset
- LFP and unit activity recording
- Electrodes replaced by 4 tetrodes or 2
 heptodes for smaller recording areas

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"We have the solution!"

Innovative Products for Electrophysiology

Together with the research groups of Professor Stefan Treue and Professor Alexander Gail at the German Primate Center in Goettingen, we have developed an <u>A</u>daptive <u>M</u>ulti<u>E</u>lectrode <u>P</u>ositioning (AMEP) system that consists of a reuseable recording chamber inset and a xyz-manipulator [1].



Fig. 1a: AMEP recording chamber inset







Figure 2: Xyz-manipulator (robot) for a recurring bidirectional positioning of up to 16 microelectrodes.





[1] E. Ferrea, L. Suriya-Arunroj, D. Hoehl, U. Thomas, A. Gail, *Implantable computer-controlled adaptive multi-electrode positioning system (AMEP)*, Journal of Neurophysiology (2017).



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Figure 3: AMEP components

The AMEP system consists of an implantable recording chamber, a recording chamber inset and a xyz -manipulator (robot). After implantation of the recording chamber and insertion of the chamber inset the robot is used for initial electrode positioning. When all electrodes are recording neural activity the robot is removed from the chamber inset and the recording experiment can start.







Figure 4: AMEP working principle. The xyz-manipulator (robot) is used for initial positioning or later re-positioning of the 16 recording microelectrodes. The two video cameras allow the researcher a visual control of the electrode placement on the computer screen. When the 16 electrodes are positioned the robot is removed from the AMEP system and the extracellular signals are recorded with the wireless recording system.



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Technical Data

Parameter	Value
Number of recording channels	16
Electrode type	Quartz glass insulated platinum/tungsten
Electrode diameter	100 μ m fiber electrodes (with slide contact)
Electrode spacing	1.5mm (solution for smaller spacing on request)
Electrode impedance	1-2 MΩ (@1kHz sine wave, 5nA)
Electrode travel / max. penetration depth	8mm / 12mm
Headstage gain (chamber inset)	1 (Unity gain follower)
Power supply	Li-Ion accumulator (delivered with charger)
Data acquisiton on computer	16 channels, 16bit, 25kHz/channel on all 16 ch.
Bandwidth	1Hz5kHz





Figure 5: AMEP block diagram. The xyz-manipulator (robot) is used for initial positioning or later re-positioning of the 16 recording microelectrodes. The two video cameras allow the researcher a visual control of the electrode placement. When the 16 electrodes are positioned the robot is removed from the AMEP system and the extracellular signals are recorded with the wireless recording system. The recording bandwidth is 1Hz...5kHz to record unit activity and local field potentials.

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