

VIKING EEG: A federated data sharing platform for education and research

A complete system for managing, reviewing and sharing neurophysiological data stored at your own institution

Two applications, one platform

VIKING EEG uses Epicurrents, an open-source software platform, with two main applications:

Management service: receives uploads in the lab's native formats, converts them to EDF and de-identifies them on upload, and organizes studies into datasets with explicit per-user access rights. It also keeps the audit trail, drives federation with partner sites, and manages encrypted backups — everything except viewing happens here.

Browser-based viewer: displays and annotates the recordings, served from the same instance — a reviewer opens a study directly in their web browser. Signal drawing is handled by the computer's graphics hardware, so scrolling stays smooth even in long recordings. More advanced analysis tools such as zero-phase filtering and source localization run directly in the browser, so results appear without waiting on a server.

Not intended or certified for clinical diagnostics.

Modular design for multimodal support

NEUROPHYSIOLOGY

EEG NCS EMG Actigraphy

PSG – in development

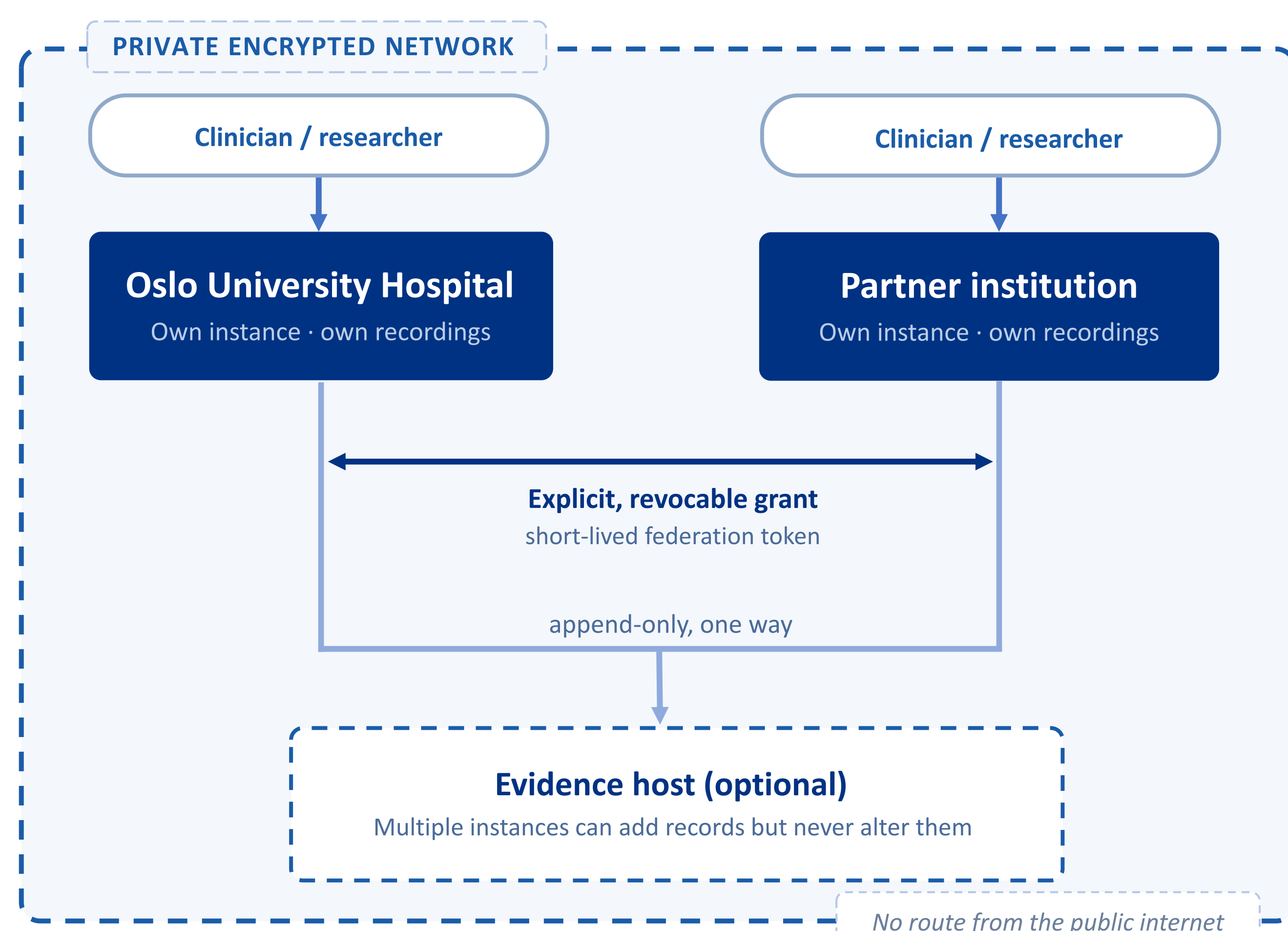
MEG – in development

SUPPORTIVE MODALITIES AND FORMATS

Tabular Audio DICOM BDF Nicolet.e

New modalities and data formats can be added as independent modules, but the platform was originally built for EEG and stores recordings in EDF format.

Share without surrendering control



Recordings stay on the instance that owns them. Sharing happens through an explicit grant to a named peer, using cryptographically signed, short-lived tokens, revocable at any time. A peer cannot discover anything it has not been granted.

A private, encrypted network (WireGuard VPN) connects partner institutions while keeping the platform entirely off the public internet. Clinicians and researchers always authenticate to their own local instance — federated shares appear in the instance alongside their local resources, and nothing about the workflow changes.

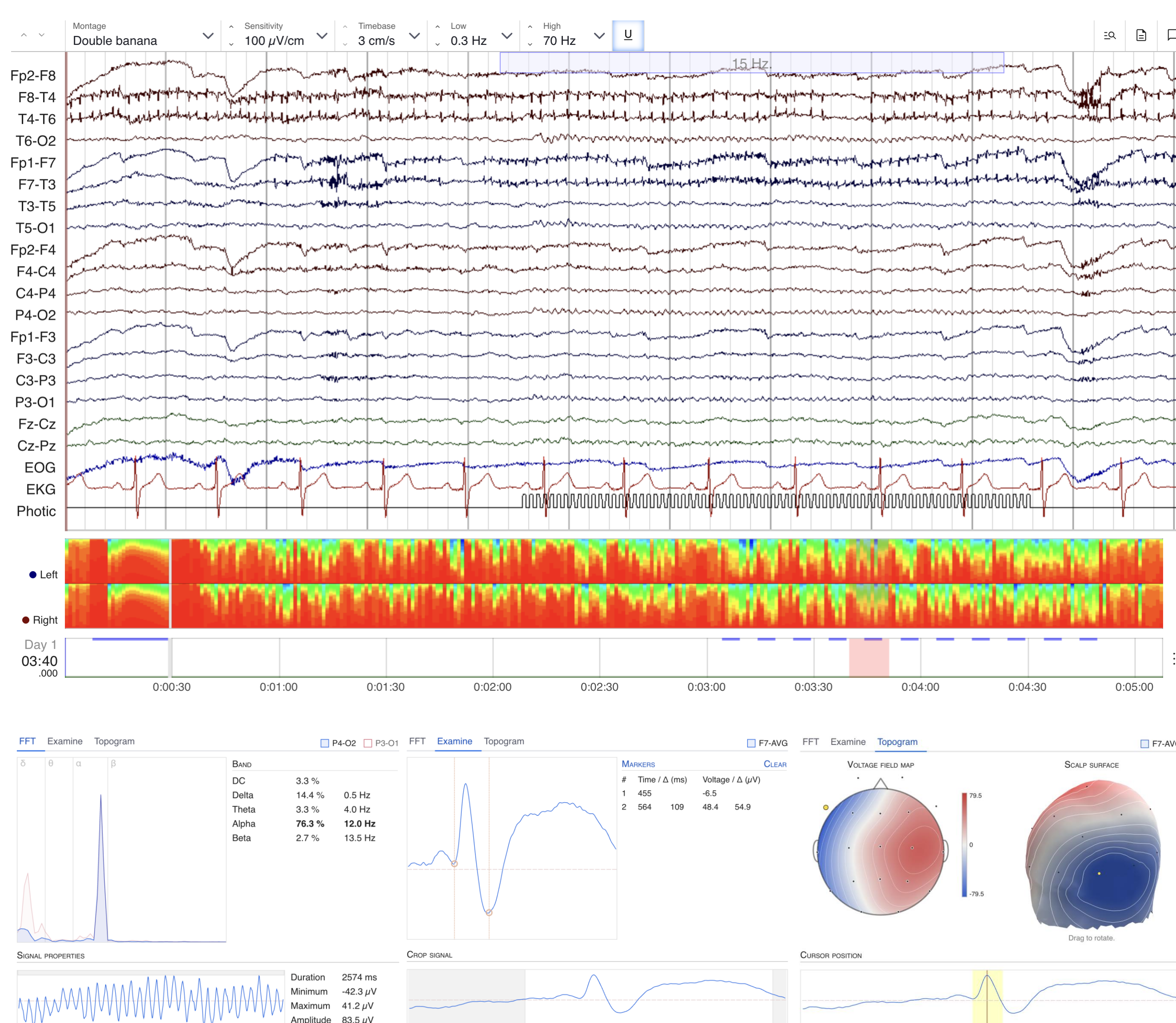
Full history, provable and reversible

Every request and every field-level change is logged in an audit trail with a before/after snapshot, and any logged change can be restored from its saved prior state. Each entry mixes the previous entry's digital fingerprint into its own, so a retroactive edit breaks the chain from that point on. Recordings are de-identified on upload, and delivery re-applies the same pipeline per recipient — a grantee never receives identifying header fields or original annotations. Following the GDPR principles, erasure reaches both patient recordings and user data.

Already in use

The platform is used in research projects at the Section for Clinical Neurophysiology, Oslo University Hospital. The web-based viewer has been featured in EAN congress hands-on EEG courses 2024–2026.

Review in the browser



Above: Epicurrents review application: EEG in a longitudinal bipolar montage with reviewer annotations.

Below: signal analysis tools including FFT, waveform examiner and voltage topogram.

Self-hosted, free, and yours to adapt

The project is open source, and the software is free to use. One deployment per institution, on your own infrastructure; data never leaves it unless you grant it. First run generates every secret — application key, federation key pair, backup passphrase — so there is no shared credential and no vendor account anywhere in the chain. An instance can be modified to fit individual needs using site-specific add-on modules that can override and extend the functionality of the base platform.

What it takes to run

One Docker deployment your IT department can run on a single server or virtual machine. Reviewers need a Chromium-based browser to take advantage of all features.

