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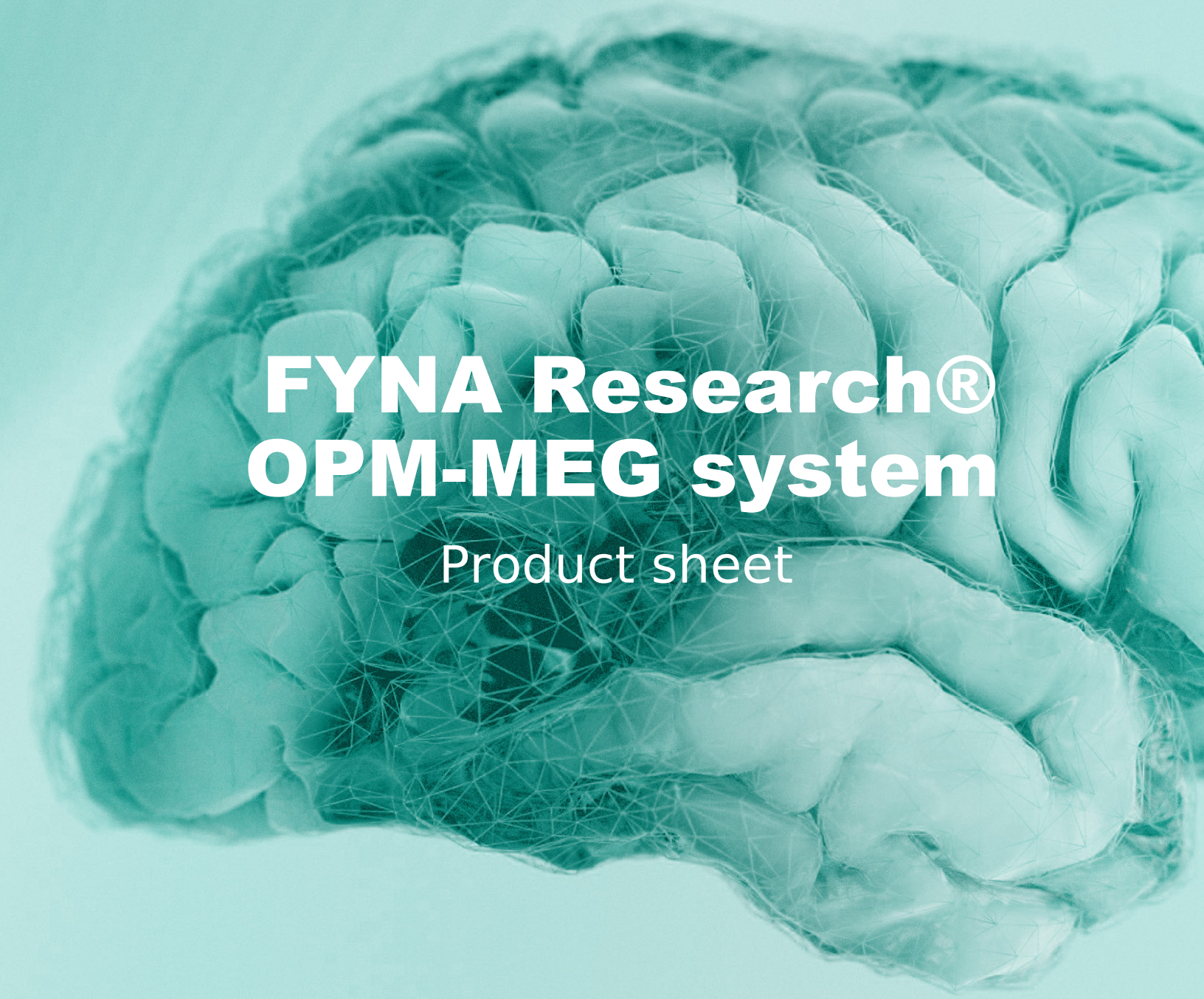

# FYNA Research® OPM-MEG system

## Product sheet

Official Distributor

BRAINBOX

INTEGRATING SOLUTIONS FOR NEUROSCIENCE

The **FYNA Research®** system is a magnetoencephalography (MEG) device that utilizes Helium-based Optically Pumped Magnetometers (OPMs). It is a brain imaging system that can be upgraded to accommodate up to 96 sensors on a single helmet.

Unlike rubidium-based OPMs, this new generation of OPMs based on helium produce no noticeable heat during operation, enabling extended recording sessions and making the system suitable for use with newborns and children.

The Helium-based sensors offer a wide bandwidth (DC–2000 Hz), which makes them extremely versatile and applicable across multiple domains, including magnetospinography (MSG), magnetomyography (MMG), and magnetoneurography (MNG).

## Tri-Axial Vector Sensors

Utilizing Helium atoms and optical pumping,
these sensors are designed for reliability and versatility.

- Dimensions: 21 x 21 x 54 mm  (0.83" x 0.83" x 2.13").
- Weight (excluding cable): 25 grams (1.59 oz).
- Sensitivity: 25 fT/√Hz on the X and Y axes; 200 fT/√Hz on the Z axis.
- Bandwidth: DC - 2000 Hz.
- Operation: Each axis functions in closed-loop mode, continuously compensating for the measured magnetic field.
- Dynamic Range: ±200 nT per axis.
- The closed-loop design ensures:
  - A linear response within the defined dynamic range (±200 nT).
  - Cancellation of cross-axis effects.

- Adjacent sensor cross-talk is inherently below 8%. A patented automatic correction algorithm further reduces this metric to less than 0.5%.
- HPI (head positions indicators) for getting sensors positioned into the head reference frame,  enabling co-registration with MRI data during post-processing.
- The helmet allows placement of up to two “reference” sensors using the supplied accessory.

The **FYNA Research®** system includes a auto-localization function for localizing sensors within the patient’s head coordinate frame. This is achieved through a proprietary algorithm that alternately configures selected sensors as three-axis emitters and others as three-axis receivers. Users can freely reposition the sensors on the helmet to suit specific requirements.

## Control System Cabinet

- Dimensions:  55 x 60 x 160 cm (1.8’ x 1.97’ x 5.25’) (L x W x H)
- Weight: 80 kg (176 lbs) configured for 48 sensors.
- Modular Design: The control system supports up to 6 blocks of 16 sensors each within a single chassis.
- Power Supply: The FYNA Research® system operates on standard mains electricity (110V–220V, 50–60Hz). Typical power consumption Is 700W for 48 sensors and 1300W for 96 sensors.

## Conformable Helmet

The headset holder is designed to support the majority of the helmet's weight and is compatible with commonly used chairs.

- Constructed from silicone and textile materials.
- The sensor array conforms to the patient's head, maintaining less than 2mm (0,08“) offset from the scalp. Each sensor remains in intimate contact with the patient's scalp even during movement.
- Includes 97 slots for sensor placement.
- Adult helmet: Suitable for head sizes Between 54cm (9.3”) and 63cm (24.8”) (96 sensors).
- Child helmet: Suitable for head sizes between 49cm (7.3”) and 64cm (9.3”) (89 sensors).
- Weight excluding sensors: 420g (0.93 lb) for adults, 400g (0.88 lb) for children.

## Integration With Other Systems

Equipped with digital trigger channels to facilitate synchronization with additional neurophysiological systems:

- 16 trigger input lines, supporting up to $2^{16}$ distinct trigger codes.
- Up to 24 trigger output lines (TTL 0–5 V via DB25 connector).
- 1 video input and 2 video outputs (Display port).
- Stereo audio input and output via 3,5mm (1/8” jacks).

Further integration includes:

- 8 bipolar (or 16 uni polar) electrical input channels for recording EEG, EMG, ECG, and EOG signals.

## User Interface & Acquisition Software

The FYNA Research® system features embedded, proprietary control and data acquisition software, offering:

- An intuitive graphical user interface.
- Automatic system start-up with real-time sensor status display.
- Simple adjustment of acquisition and visualization parameters.
- Customizable or pre-configured sensor layouts.
- 3D visualization of sensor self-localization.
- Real-time signal display, with sampling rates ranging from 100 Hz to 6000 Hz.
- Online filtering options including low-pass, high-pass, band-pass, and notch filters.
- Real-time trigger display with associated event codes.
- Data output: Standard .fiff file format, fully compatible with MNE Python software and other common analysis platforms.
- API support: A low-level C++ API allows real-time acquisition and external exchange of MEG signals.

## Use & Storage Conditions

- Operating environment: Indoor medical settings, at altitudes below 2000 (6500 feet) meters
- Operating temperature range: 15°C (59 °F) to 30°C (86° F)
- Storage and transport conditions (non-condensing): 0°C (32° F)
- Humidity range: 0–70% relative humidity
- Estimated device lifespan: 10 years
- Requires magnetically shielded room but no active compensation to null earth’s field.

**The FYNA Research® system is for research use only.**

**Watch the product demonstration:**

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**www.mag4health.com**

**contact@mag4health.com**