



## ORIONLIFESPAN™ MEG



*Opening **NEW FRONTIERS**  
in clinical and research MEG*

### LifeSpan Functional Imaging from Children to Adults

#### Innovative Advantages:

- Patented, two-in-one MEG system with dual-helmet dewar
- High signal-to-noise ratio DROS SQUIDS
- Simultaneous acquisition from both helmets (hyperscanning) available
- Single-helmet, either adult or pediatric, option available
- Simultaneous, low-noise, high-density EEG
- Zero-loss helium recycling with no downtime
- Powered by the CURRY™ neuroimaging platform, the world's standard software for MEG/EEG analysis
- MEG/EEG synchronized video recording



CURRY® is the European Epilepsy  
consortium's standard  
analysis platform

FDA (USA) and KFDA (Korea) cleared for clinical use.

DUAL-HELMET MEG

# ORION LIFESPAN™ MEG

## System advantages

- Patented rotating dual-helmet dewar for adult and pediatric patients (adult/adult, pediatric/pediatric and single helmet options available)
- 186/138 adult/pediatric MEG sensors (250/200 option available)
- Effective environmental noise reduction reference channel array
- Designed to fit within a standard-sized (3x4 m) Magnetically Shielded Room (MSR) For Hyperscanning or non-rotating installations, a 2.5x5 m MSR is recommended
- Specially designed adjustable bed system for adult and pediatric patients
- Fully integrated with the CURRY Neuroimaging Suite for both acquisition and data analysis.

## Sensor advantages

- A new generation of high-sensitivity axial gradiometers to optimize detection of cortical and deep sources
- Patented high-gain Double-Relaxation Oscillation SQUID (DROS) sensors
- Average of sensor sensitivity better than  $6 \text{ fT}_{\text{rms}}/\sqrt{\text{Hz}}$  in the white-noise regime
- Sampling rate for all channels up to 10 kHz, with resolution of 24 bits
- 32 to 256 channels of integrated simultaneous EEG, plus 4 to 16 bipolar/auxiliary analog channels.

## Helium Recycling advantages

- Continuous reliquification of helium with no refilling by the user required. Top-ups, if required, will be done annually by Compumedics.
- Closed-loop system minimizes operating costs and maintenance requirements
- MEG available 24/7 for acquisitions. No downtime.

**2 MEGs  
in 1 MSR**

Minimizes Footprint  
Minimizes Costs  
Maximizes ROI

**ZERO-LOSS  
HELIUM RECYCLING**

24/7 Uptime  
No Refilling  
Minimizes Operational Cost

**186/138**

Adult/Pediatric MEG Channels  
Axial Gradiometers DROS Sensors

**250/200**

High-Density Option

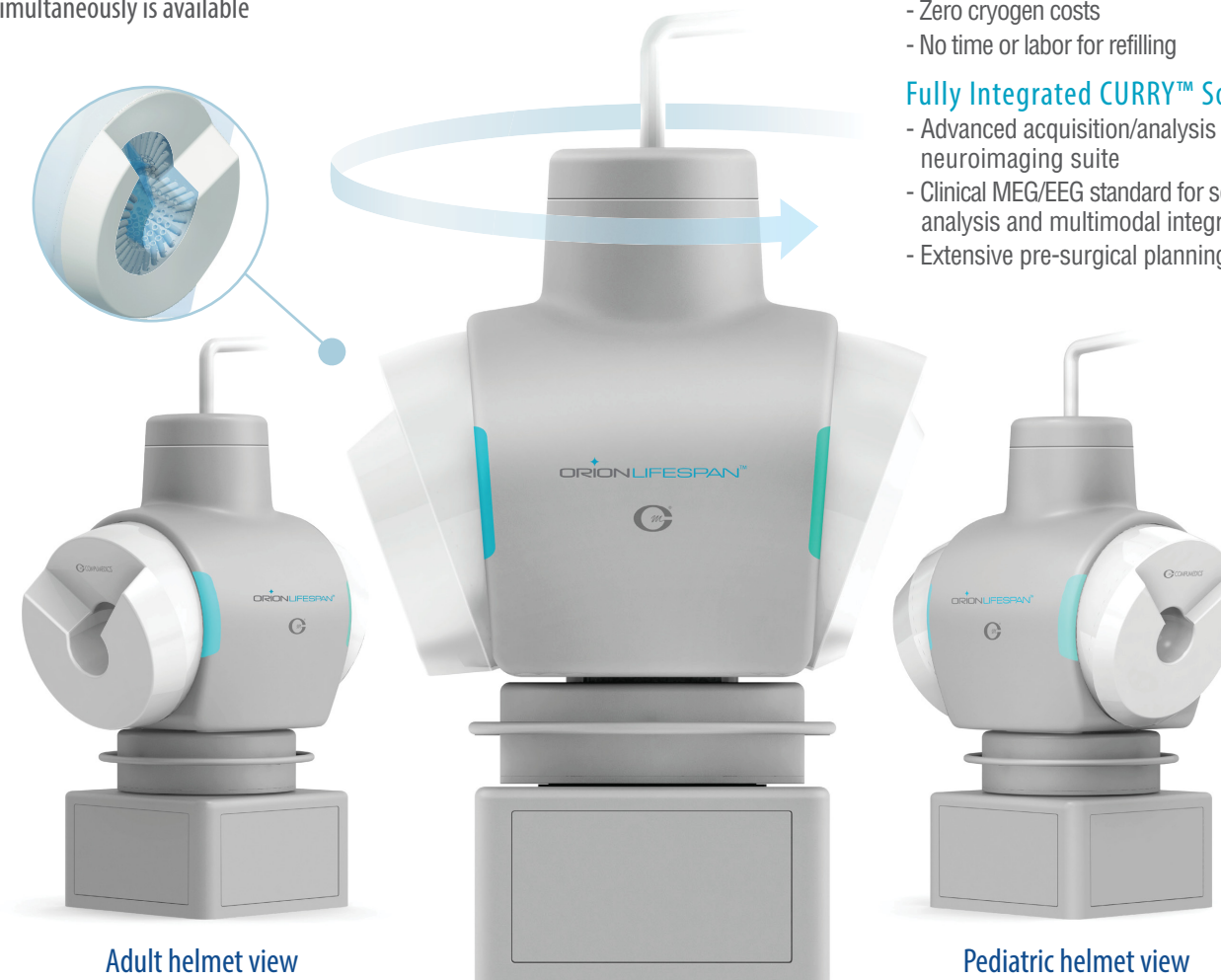
**UP TO  
256 EEG**

Fully Synchronized  
EEG Channels

## Orion LifeSpan™ Key Advantages

### Patented Rotating Dual-Helmet Adult/Pediatric Dewar

- Two MEG systems in one MSR to minimize footprint and maximize flexibility
- Optimum data quality across the entire patient's lifespan, not only the adults
- Increased patient population maximizes return on investment
- Ability to record from both MEG helmets simultaneously is available



### Patented SQUID Sensing System

- DROS sensors and 2<sup>nd</sup>-generation axial gradiometers
- Higher signal sensitivity
- Reduced impact from environmental interference

### Fully Integrated EEG

- 32, 64, 128 or 256 channels available
- A variety of cap sizes for speedy, consistent application of electrodes
- Synchronized to MEG acquisition

### Patented Zero-Loss Helium Recycling

- 100% system availability
- Zero cryogen costs
- No time or labor for refilling

### Fully Integrated CURRY™ Software

- Advanced acquisition/analysis neuroimaging suite
- Clinical MEG/EEG standard for source analysis and multimodal integration
- Extensive pre-surgical planning tools

## CURRY™ Acquisition and Analytics Software Platform Advantages^

- Optimized for 64-bit, Windows OS 10
- Intuitive user interface
- Co-registration of EEG & MEG, with MRI, fMRI, CT, SPECT, PET, DTI
- CURRY integrated with STIM2, including eloquent cortex evaluation
- Integrated synchronized video
- Individualized head models for MEG, EEG and combined analysis including both individualized BEM and FEM
- Complete dipole, CDR, statistics modules
- User-friendly pre-surgical planning module
- Maximum memory access for rapid processing of large data files (64 bit native application)
- Suitable for all applications (research, clinical)
- Enhanced connectivity with other hardware and software (e.g. Free Surfer, Matlab™)
- sEEG analysis module

## Magnetoencephalography (MEG) and CURRY™ - A long history together

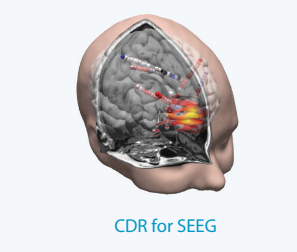
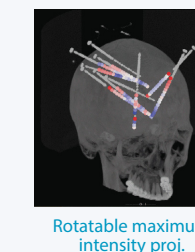
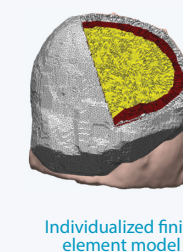
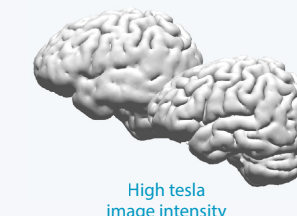
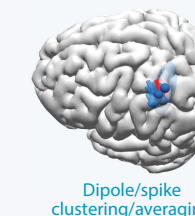
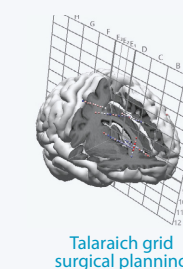
The CURRY Neuroimaging platform and MEG have a history stretching back over 30 years. CURRY was first conceived of in the late 1980s as an MEG analysis tool. Software development by its core engineering architects has continued uninterrupted until today.

Already by 1999 studies were being published describing the application of CURRY to cortical localization of auditory, visual and tactile stimulation based on EEG and MEG activity. Localizing epileptic discharges, identifying functionally critical areas of the brain controlling language and memory testing soon followed. Processing algorithms were validated for evaluation of mild to severe traumatic brain injury.

The early 2000s saw a rapid expansion of the use of CURRY in both the research and clinical communities. The benefits associated with CURRY's ability to integrate MEG with EEG and co-register these high temporal resolution functional imaging data with structural neuroimaging data including MRI, CT, DTI, PET, SPECT and fMRI accelerated the adoption.

Early clinical adopters supported and championed the benefits of the source localization tools, contributing to the development of specific source analysis billing codes for EEG and MEG.

Today, CURRY is the industry-standard software platform for the worldwide clinical MEG community, particularly for those assessing epilepsy. CURRY is certified by the FDA, CE Mark and other regulatory bodies worldwide.



CURRY is the European Epilepsy consortium's standard analysis platform

## Orion LifeSpan specifications\*\*

### SQUID gradiometer

<b>SQUID sensor type:</b>	Double relaxation oscillation SQUID (DROS) with largest voltage output
<b>Material:</b>	Based on reliable Nb/AIO <sub>x</sub> /Nb junction technology
<b>Feedback:</b>	External feedback to eliminate inter-channel crosstalk
<b>Heater:</b>	Integrated Pd thin-film heater to remove trapped flux
<b>Pickup coil:</b>	High-balancing first-order axial gradiometer baseline 50 mm; Adult winding 1:1 (20 mm diameter), Pediatric winding, 2:2 (16 mm diameter)
<b>Guaranteed sensitivity:</b>	Better than 10 fT <sub>rms</sub> /√Hz white noise

### Sensor Array

<b>Standard density:</b>	186 adult / 138 pediatric sensors
<b>Max sensor density:</b>	250 adult / 200 pediatric sensors
<b>Noise cancellation:</b>	By reference array
<b>Sensor-in-vacuum:</b>	SQUIDS and pickup coils mounted within the dewar vacuum space for reduced cryogenic noise
<b>Field component:</b>	Measurement of dB <sub>r</sub> /dr (r-axis is normal to local head surface)

### Dewar

<b>Dewar structure:</b>	Dual-helmet, optimized for adult and pediatric measurements
<b>Dewar positioning:</b>	Supine measurement 180 degree rotation to switch between adult and pediatric position
<b>Helium reliquification:</b>	Continuous operation with 24/7 uptime
<b>Tail thermal gap:</b>	< 20 mm

### SQUID electronics

<b>Flux-locked loop:</b>	DC bias, direct readout (no modulation)
<b>Control:</b>	Automatic control of SQUID operation using Interference-free optical fiber-based control
<b>Bandwidth:</b>	DC to 2 kHz based on sampling rate

### Acquisition

<b>A/D conversion:</b>	Max 10 kHz/channel, DC-2 kHz maximum passband for MEG and EEG, 24 bit resolution Synchronized EEG acquisition, 32-256 channels
<b>Computer:</b>	Workstation computers/32-inch color LCD monitor Nvidia graphics card (3D Stereoscapy)**
<b>CPU:</b>	3 GHz, Intel i7 Windows-based, 16 GB RAM
<b>Mass data storage:</b>	1 terabyte SSD main drive and secondary drive**

### Real-time archivable synchronized MEG/EEG and video

### CURRY Neuroimaging Software

- System control of SQUID operation, FLL (offset voltage, integrator)
- Real-time display of MEG/EEG Signals
- Signal processing of baseline correction, digital filtering, artifact suppression, manual/automated event marking
- Dipole and CDR source modeling
- Pre-surgical planning

### Stimulus delivery

- STIM2 with auditory, visual, electric stimulation

### Measurement accessories

#### High-accuracy electrode digitization

**Head position monitor:** 5 circular coils integrated with EEG Cap

**Patient monitor:** 1 CCD camera and 1 LCD monitor

**Communication:** Voice communication using a noise-free microphone and speaker

### Magnetically shielded room

<b>Structure:</b>	2-layer mu-metal and 1-layer aluminum
<b>Inner dimensions:</b>	4 m (L) x 3 m (W) x 2.4 m (H), may be modified upon site evaluation. Wall thickness of 200-250 mm.
<b>Door:</b>	No door threshold (equal height with measurement room)
<b>Shielding factors:</b>	32 dB @ 0.01 Hz, 38 dB @ 0.1 Hz, 56 dB @ 1 Hz, 78 dB @ 10 Hz and 94 dB @ 100 Hz
<b>Illumination:</b>	Low-noise DC lighting

\*\* Delivered systems will have equal or better specifications



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