



Embarking on a new era
of sleep research





Dipl. Phys. Gerhart Schroff
Managing Director
Gemtec Laseroptische Systeme GmbH

„Over 30 years of
experience in research
and development are the
basis for our innovative
strength“



For the first time, innovative field-effect sensors make it possible to **analyze sleep without contact**, using an easy-to-use, user-friendly, and comfortable sleep mask.

Unlike **polysomnography, which has been standard** practice in sleep laboratories to date, this method eliminates the need for complex placement of adhesive electrodes, the necessary cabling, and the time-consuming calibration of the contact resistance between the adhesive electrodes and the body surface.

The **newly developed field-effect sensors** make it possible for the first time to measure the **electrical fields** emanating from the eyes without contact, to use this data to determine eye movements, and to use them for sleep analysis. In contrast to polysomnography, the **SOMNOSYNC sleep mask** can also measure and analyze the chaotic, burst-like, rapid **eye and eyelid** movements **characteristic of the REM phase**. For this purpose, three sensors per eye were integrated into the sleep mask.





The contactless recording of rapid, **chaotic, burst-like eye and eyelid movements** opens up the possibility, for the first time, to systematically examine **attention** and **reflection during sleep** using objective criteria. The required **AR analysis module** is in development.

This opens up entirely **new possibilities** for **research**. From the analysis of sleep disorders such as **RBD**, or the analysis of **memory formation** during dreams and thus also during waking hours, to methods for **treating nightmares**.



The data collected by the **SOMNOSYNC sleep mask** can be wirelessly transferred to a **notebook** or PC using a **BLE module**.

Intuitive, clearly structured **analysis software** determines **sleep phases** based on the detected rapid, chaotic, burst-like eye and eyelid movements, both online and offline.

Offline analysis offers the possibility of developing new, customer-specific analysis approaches **and testing them on existing data sets.**



Advantages

- Contactless detection of eye movements
- No adhesive electrodes or wiring required
- Highly comfortable, easy to use
- Easily customizable with interchangeable pads
- Intuitive, structured analysis software
- Offline analysis for customer-specific signal analyses
- Screening and diagnosis also in the home environment

Technical data

Recording duration

10 hours

Weight

130 g (with Akku)

Material

PA11

interface

BLE-Modul; RN 4020 (Microchip Technology)

Processor

MSP 4030 F2410 (TI)

With integrated AD converter

12 Bit

sensitivity the sensors

> 40 μ V per Bit 400

sampling rate

Hz per sensor

Number of sensors

3 per eye

Frequency range

0,2 Hz to 47 Hz 1

Signal transmitter

LED per eye

Current consumption

< 25 mA

Energy supply

Akku; 270 mAh,
removable, with charging unit



GEMTEC Laseroptische Systeme GmbH
Otto-Hahn-Str. 3 | 71364 Winnenden
+49 7195 911 2950 | info@gemtec-online.com

Development

Gemtec Laseroptische Systeme GmbH
www.gemtec-online.com

Design

DQBD GmbH | design and development
www.dqbd.de

