

Medical Devices for Sleep Diagnostics and Therapy

SOMNOmedics

SOMNOscreen™



- MINIATURISED
- MOBILE
- FLEXIBLE

From Screener to a full PSG System in the palm of your hand

- upgradeable at any time!

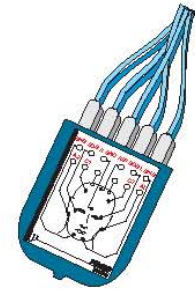
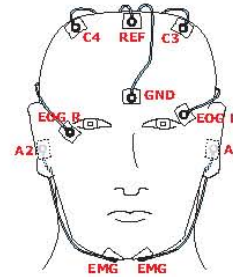
- Complete portable Polysomnograph with up to 28 Channels
- Wireless Online Data Transmission of all signals to the PC through the built-in Transmitter
- Unparalleled Mobility for the Patient and Sleep Practitioner
- Wireless Online Transmission and Synchronisation of Digital Video



SOMNOmedics

Medical Technology today needs to react to the knowledge gained from Medical Research in order to meet the requirements of Medical Practitioners and Patients. Equipment development needs to react quickly to technological advances in Sleep Medicine.

We, the SOMNOmedics Team have accepted this challenge and through the use of these new technologies have developed an innovative solution for Sleep Diagnostics and Therapy which will offer you the Practitioner as well as the Patient a flexible and reliable, easy to use system in the Sleep Laboratory, Patients home or anywhere else.



SOMNOscreen™

Miniaturisation - SOMNOscreen™, currently the smallest full Polysomnography system available today. Featuring up to 28-channels of Polysomnographic data, the palm sized unit can either store the data on a Compact Flash Card or transmit the data directly to the PC via a Wireless Transmitter.

Mobility - Sleep Studies should be performed where it is most suitable for the Sleep Practitioner and the Patient.

Mobility for the Patient - It should be possible to measure sleep data in the Patient's normal sleeping environment at home, maintaining their normal routine. To avoid panic attacks, the Patient should not be tied to the bed with electrodes and cables.

With the SOMNOscreen™, the Patient is free to move about and even go to the toilet. The unit, electrodes and cables are all worn on the Patient.

Mobility for the Practitioner - Hospital stays are expensive. Staff, accommodation, meals, etc. all add to the high cost of a sleep study. With the SOMNOscreen™, even video can be recorded away from Sleep laboratory with the mobile digital video unit, which includes Video and Audio recording with a built in infrared light source and radio transmitter.

Flexibility of equipment choice - You decide which configuration to start with the SOMNOscreen™ is available in a variety of configurations from a simple Screener to a full Sleep Laboratory system with telemetry video. With the SOMNOscreen™, you are also able to take advantage of any new developments that occur through software and hardware upgrades.

Flexibility in measurement - You can define a new montage to select the specific parameters you wish to measure.

Flexibility in application - Basic Respiratory Screening, CPAP- Titration, full PSG recording with or without Video, 24 hour ambulatory EEG recording, Stationary EEG- Monitoring with Video control or 24 hour ECG and Pulse Oximetry recording. The choice is yours.

Technical Features

- Miniaturised, portable unit - worn entirely on Patient
- Up to 28 Channels - 7 Sensors built in to base unit
- Modular design upgradeable at any time
- Data recorded at 16 Bit
- 4-Fold Oversampling to improve the Signal to Noise Ratio; this produces extremely clear signals
- Freely adjustable Sampling Rates up to 512/s (optional 2048/s)
- Display with Control Keys allows PC independent set-up and operation
- View and control signals on the display including system status and signal quality
- Li-ION Battery has no memory effect. Provides 36 hours of continuous recording of a full PSG study
- Data is stored on industry standard High Speed Compact Flash Cards with up to 1 GB capacity or up to 70 hours of PSG recording time



Wireless Online Data Transfer to the PC - A small Radio Module transfers the data up to 100m to the PC. Up to 32 systems can be used simultaneously

Wireless synchronisation of Video and Sound - Video and Sound signals are recorded with the Compact IR Camera and IR light source and transferred to the PC up to 100m away.



Sensors

A new generation of active sensors has been developed for the SOMNOscreen™. These sensors provide excellent signal quality, are less susceptible to failure and will therefore last a long time.

All Sensors are Silicone embedded. They are comfortable for the patient to wear while remaining mechanically robust and consistent. Quick and easy cleaning allows the unit to be prepared for the next patient.

For pediatric application we offer a special sensor kit.

Internal Sensors

- Light Sensor for determining the relevant measurement time: Light Off and Light On (TIB)
- Internal Effort: It is possible to define this sensor as either a Thoracic or Abdominal Effort
- Body Position: Detection of positions: Left, Right, Supine, Prone and Upright



Pulse Oximeter: A High Quality Pulse Oximeter for recording the SpO2, Pulse Rate and the Pulsatile Waveform. The probe is a comfortable silicone-embedded finger probe.

- Patient Marker: For the input of relevant time points which the patient may wish to document, for example, taking medication, going to the toilet, etc.

External Sensors



Miniaturised Headbox: 10 EXG inputs, 8 Referential for EEG/EOG and 2 Differential inputs for EMG/ECG



Thermistor: Naso/Oral Flow



Effort Sensor: Thoracic and/or Abdominal Effort



Microphone: Snoring sound



Active Sensors: (2-fold or 3-fold) Recording the Leg EMG for Periodic Leg Movement analysis



Recording the ECG with an active three point sensor for optimised signals



Activity Monitor: Estimating the Sleep Efficiency through Activity analysis



Pressure Sensor: for measuring the CPAP pressure from a CPAP machine, controlling CPAP during Titration, Flow using a nasal cannula

- Auxiliary: Input of an external signal

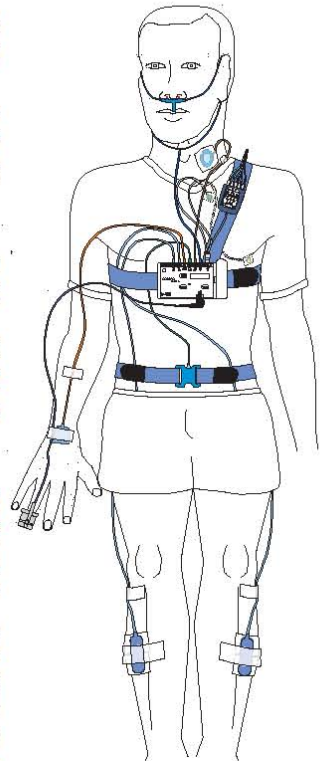
Application

The SOMNOscreen™ is fitted directly to either the Abdomen or Thorax.

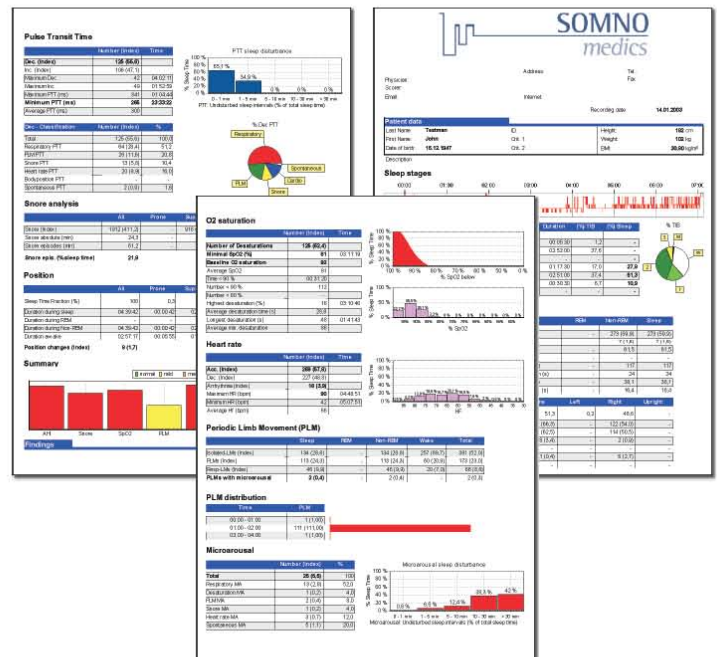
The electrodes and cables are easily identified both by colour coding as well as being mechanically key coded.

The unit can be programmed to automatically start and run for a pre-programmed duration.

It is possible to program the unit with up to 30 measurement sequences. - Control signals from the built in display before !



Fast data transfer of measurement data to the PC after recording. Simply insert the Compact Flash Card in the reader and within 20 seconds, you are ready to open and analyse the study. - Complete automatic analysis with Analysis Report printout within 2-3 minutes (see Reports below).



Analyses

Automatic analysis of all standard signals including

Apnoea/Hypopnoea calculation according to type and in correlation to Desaturations, Brady/Tachycardia and Micro Arousals

Snoring, PLM Detection, Micro arousal detection according to the ASDA Criteria, Brady/Tachycardia and Arrhythmia analysis, O₂ Desaturations, Body Position, PTT Pulse Transit Time, Calculation of the Average Frequency Value (AFV), the Alpha + Beta and Delta Frequency Bands from the EEG, Sleep Staging Analysis with Sleep Profile, Display of the Sleep Staging Reliability, REM Detection and REM Density.

New information is being developed including

Sleep Fragmentation based on Micro Arousal and PTT Arousal Analysis

Flow Limitation - Obstruction Level Analysis

Systolic Blood Pressure: Display of the Systolic Blood Pressure Curve* and automatic recognition and correlation of fluctuative pressure changes

Heart Rate Variability

FFT Module for the sequential analysis of the raw data

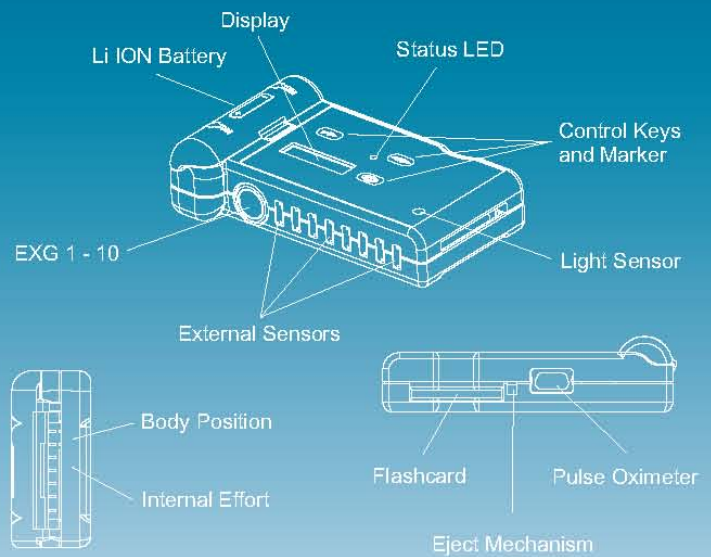
Compare various Sleep Profiles with indication of variability



- (1) Index per hour
- (2) Time Line
- (3) Analyses Curves
- (4) Raw Data Curves
- (5) Time Base Analyses
- (6) Time Base Raw Data
- (7) Sleep Stages
- (8) Show Sleep Profile
- (9) Events
- (10) Video Screen

The system provides a comfortable, quick and easy means of editing the recordings. All events are colour coded and displayed in the raw data view.

* Patent Pending



5 - 28 CHANNELS MODULAR AND EXPANDABLE

10 AC Channels (8 Referential and 2 Differential)

11 Respiratory and AUX-Channels

7 Internal (SPO₂, Pulse rate, Plethysmography, Position, Ambient Light, Button Marker, Thoracical Effort)

SENSORS

External Sensors	Thermistor for nasal oral Flow
	Abdominal Effort
	Activity Sensor (3 axis) for actigraphy or PLM
	Active Sensors for EMG/ECG
	Microphone for Snore Detection
	EDA Sensor (electro dermal activity)
	Temperature Sensor (rectal)
	Pressure Sensor (0 - 24 cmH ₂ O)
	nasal/oral Flow (Cannula)
	CPAP-Pressure
	CPAP-Flow
	CPAP-Snore
	Oesophagus Pressure
	(-100 to +100 cmH ₂ O)

DATA PROCESSING

Active Filtering

16 Bit ADC, 4 fold oversampling

Different Sampling Rates adjustable (4/s up to 512/s), optional 2048/s

POWER SUPPLY

Li ION Battery (rechargeable) up to 36-hour Recordings

SIZE AND WEIGHT

140 x 70 x 28 mm, 220 gr (incl. Battery)

SOFTWARE - DOMINO SOFTWARE

Efficient Analysis and Scoring Software

INTERACTIVE KEYBOARD AND DISPLAY

Signal Check on Display

Programmable Start- and End-Times

Menu Controlled Display

DATA STORAGE

High-speed Compact Flashcard (up to 1 GB capacity)

OPTIONS

Wireless Online Data Transfer (up to 100m), LAN, Serial or USB

Video

- Synchronised Video in DVD Quality, 25 Frames/ sec, latest Data Compressing System

- Audio (20 - 12.000 Hz)

- Black and White recording for IR recording or Colour recording in daylight

- Fully synchronised with raw data

- Playback at different frame speeds (0.1 - 100 fold)

- Digital Zoom function for detailed analysis

- Easy to edit, cut and archive. Store short sequences on CD or DVD

Software Features

Re-Analysing: The data can be re-analysed at every time.

Archiving: The data can be archived to CD or DVD.

Report Generator: It is possible to design different reports for different types of studies.

Form Letters: To make reporting and documentation easier.

Patient Data Management (Option):

A powerful Patient Database is available for the efficient organisation of all patient data.

- The Sleep Profile, Graphic results summary and the complete numerical results list are stored.
- The database can produce Trend Reports comparing different tests done on the same patient. The data is stored in the database even after the case has been archived and deleted from the computer.
- The database is network compatible with a permanent patient list. A search engine is provided to help locate Patient data.

Open Architecture: All results and reports can be exported to MS Excel and SPSS. Raw Data can be exported to EDF+ and ASCII format. EDF+ files can be imported into the software. It is also possible to integrate the data from the database into your existing Practice Management Software.

Configurations

Signals and Sensors	SOMNOscreen™					
	RC easy	RC	NEURO	PSG	PSG Tele	PSG Tele +Video
Pulse Oxymeter (SpO ₂ , HR, Plethymography)	●	●		●	●	●
Button Marker	●	●	●	●	●	●
Ambient Light	●	●	●	●	●	●
Position	●	●	●	●	●	●
Thoracical Effort	●	●	●	●	●	●
Abdominal Effort	●	●	○	●	●	●
Obstruction Level	●	●	○	●	●	●
Systolic Bloodpressure	○	●		●	●	●
Flow (Thermistor)	○	●	○	●	●	●
Snore (Microphone)	○	●	○	●	●	●
PLM (left and right)	○	●	○	●	●	●
ECG (AUX) ¹⁾	○	●	○	○	○	○
PH or CO ₂ (AUX) ¹⁾	○	○	○	○	○	○
Activity	○	○	○	○	○	○
CPAP Pressure, Flow, Snore	●	●	○	●	●	●
Flow, Snore (Pressure, Nasal Cannula)	●	●	○	●	●	●
8 EEG/EOG	○	○	●	●	●	●
EMG	○	○	●	●	●	●
ECG	○	○	●	●	●	●
Wireless Online Data Transfer	○	○	○	○	●	●
Synchronized Digital Video	○	○	○	○	○	○
8 external Channels					○	○

Legend: ● Standard ○ Optional 1) Either ECG, pH or Co₂

Options

Compact Digital IR Video Camera with optional wireless transfer module

Pneumatic based Effort Sensors

Portable Oesophageal Pressure Recording with Balloon Catheter for long-term measurements

Portable long-term pH monitor

Wireless CPAP Remote Control

Sidestream Capnography

Mobile Data Transfer via telephone

Induction Plethysmography

Dual Screen Display for viewing Data and Video separately

EEG/EOG-Combi-Sensor for simplified ambulatory Sleep Recordings

Patient Database

Miniaturised Pneumotachograph for CPAP Flow Recordings or for Calibrated Volume determination

Remote Maintenance





Suite 115
302-306 Bong Bong St
Bowral NSW 2576 Australia

ascencia
HEALTHCARE FACILITATORS

T +61 (0) 2 4861 6169
F +61 (0) 2 9475 5335
E info@ascencia.com.au
www.ascencia.com.au