

# Sleep signals recorder

- Comfortable Home Sleep Testing
- Obstructive Sleep Apnea (OSA) and Periodic Limb Movement (PLM) screening
- Automatic sleep events scoring
- Synchronous sleep video monitoring
- CPAP compatible

[www.apnox.com](http://www.apnox.com)



## ApnOx<sup>®</sup>



## "ApnOx-04"

for respiratory screening  
(3 channels)

Type 4 polysomnograph  
according to AASM classification\*

## "ApnOx-10"

for cardiorespiratory monitoring  
(7 and more channels)

Type 3 polysomnograph  
according to AASM classification\*

\*AASM – American Academy of Sleep Medicine



[www.medicom-mtd.com](http://www.medicom-mtd.com)

Taganrog

## MEDICOM MTD

Research & Development Limited Company



## Basic module "ApnOx"

Sleep signals recorder "ApnOx" is the first device developed, registered and manufactured in Russia for respiratory screening (apnea screening) and cardio-respiratory monitoring

Pulse oximeter sensor's connector

Connector for nasal or oronasal breathing cannula to a pressure airflow sensor

Real-time data transmission via Bluetooth

The compact and lightweight device with an elaborate system of mounting modules and sensors provides comfort to the patient when diagnosing sleep disorders

Built-in body position sensor

AA battery

microSD

Autonomous recording mode allows conducting studies at home (**Home Sleep Testing**), and does not require the constant presence of medical personnel (Unattended Mode)

### Model "ApnOx-04" (Type IV AASM)

### Model "ApnOx-10" (Type III AASM)



Basic module "Apnox"



Basic module "Apnox"



additional module "POLY-4"

#### Recorded signals and indicators

- pressure airflow (P-flow);
- snoring (through a cannula of P-flow sensor);
- airflow speed;
- pressure from the CPAP machine;
- oxygen saturation;
- photoplethysmogram;
- pulse rate;
- perfusion index;
- body position;
- total movement activity.

#### In addition to version 04

- EMG;
- thoracic respiratory effort;
- abdominal respiratory effort;
- airflow;
- temperature;
- snore;
- heart rate;
- pulse transit time;
- skin conductance;
- limbs movement activity.

#### Automatically detected sleep events

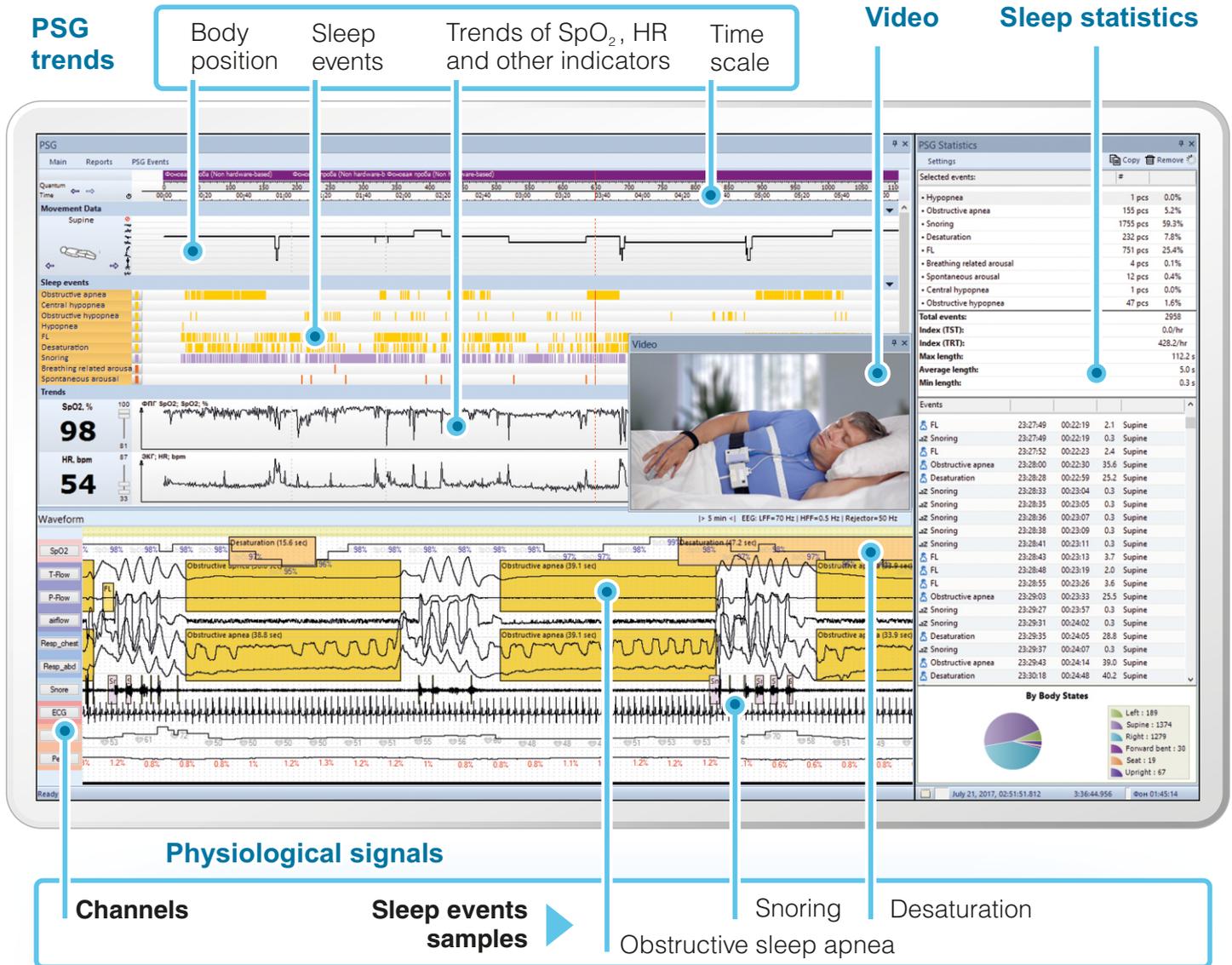
- apnea;
- snore;
- hypopnea;
- desaturation;
- critical values for SpO<sub>2</sub>;
- signs of Cheyne-Stokes breathing;
- tachycardia;
- bradycardia;
- autonomous activation (by SpO<sub>2</sub> signal).

#### In addition to version 04

- central, obstructive, mixed apnea;
- limb movements and periodic limb movements (from motion sensors or EMG);
- tachycardia, bradycardia, autonomous activation, asystole (from ECG signal).

# Software "ApnOx"

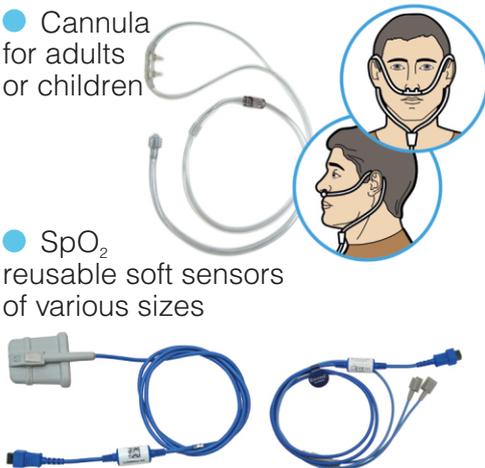
- Synchronous viewing of PSG trends and source data (physiological signals) for initial visual analysis in combination with video and audio data.
- Automatic, manual or combined scoring of PSG data.
- Viewing and correction of processing results and their statistics.
- Automatically generated report on the study by a custom template.



## Sensors and electrodes

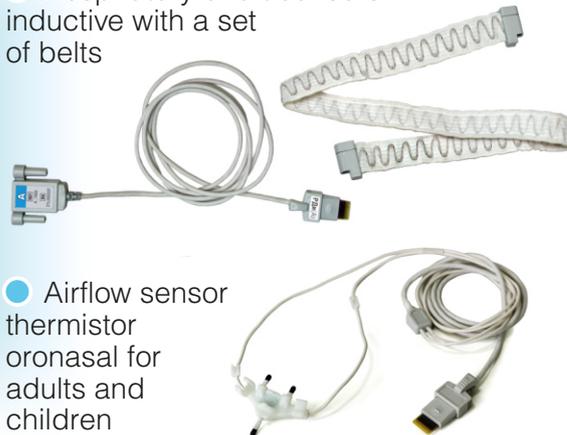
### Basic module "ApnOx"

- Cannula for adults or children
- SpO<sub>2</sub> reusable soft sensors of various sizes



### 4-channel wireless module "POLY-4"

- Respiratory effort sensors inductive with a set of belts
- Airflow sensor thermistor oronasal for adults and children
- Respiratory effort sensors tensor-resistive with a set of belts
- Snoring, motor activity, ECG, EMG, EDA sensors
- Wireless movement activity sensor (data transmission to "ApnOx" module via Bluetooth)



**Attention!** For full range of components for Sleep signals recorder "ApnOx", see the illustrated catalog on [www.apnox.com](http://www.apnox.com)

# Study reports and protocols

In accordance with detected sleep events, the application automatically generates reports, in which sleep statistics are grouped into the following reporting forms providing information about signs of OSA and PLM syndroms:

- sleep structure (sleep statistics, body position statistics);
- cardiogram (heart rate statistics);
- respiratory disorders (apnea statistics, SpO<sub>2</sub> statistics);
- limb movements (statistics of periodic lower limbs movements).

SleepLab MTD str. Frunze 68, Taganrog, Russia, 347900

Doctor: Dr. Samuel Brainsample  
 Patient: Mrs. Podgorny  
 Gender: F  
 Age: 58  
 Birth date: 18.03.1961  
 Method: Cardiorespiratory monitoring via "ApnoX" 10  
 Channels configuration: SpO<sub>2</sub>, ECG, RespEt, T-Flow, LM  
 Modification date: 11.11.2019 12:46:50

**Study description**  
 Obstructive sleep apnea syndrome was severe, AHI = 71.6/h (N<5).  
 Total number of respiratory events – 360, of which obstructive apneas – 123, mixed apneas – 0, central apneas – 1, hypopneas (also OHS and central) – 236.  
 Maximum duration of obstructive apnea – 52 s. Respiratory disorders recorded mainly not on the back.  
 Presence of snoring, number of episodes – 2065, snoring index – 410.9/h. Minimum SpO<sub>2</sub> level – 77% (N>90%). Mean SpO<sub>2</sub> was normal (N>92%) 95.4%.  
 Arousal index – 15.7/h (N<21). Most arousals were related to respiratory events.  
 Periodic limb movement disorder was mild, PML index – 14/h.

**Study information**

Date of recording	July 26, 2019
Light off (HH:MM)	20:19
Light on (HH:MM)	03:36
Total recording time (TRT) (HH:MM)	07:16

**Body position statistics**

Body position	Duration (HH:MM:SS)	% from TRT
Supine	02:41:00	37
Left	01:02:30	14
Right	01:18:10	18
Chest	00:52:20	11

**Snoring statistics**

Event	Qty.	Index, /h
Snore	2065	284,0

**By body positions**

On back	1045	143,8
Not on back	1020	140,3

**Sleep statistics**

Calculated parameter	Value
Number of apnea	124
Number of hypopnea	236
Number of apnea+hypopnea	360
Apnea index, /h	17,1
Hypopnea index, /h	32,5
Apnea+hypopnea index, /h	49,5
LM number	6
LM index, /h	0,8
PLM number	71
PLM index, /h	9,8
Snoring number	2065
Snoring index, /h	284,0
Autonomic arousals	253
Autonomic arousals index, /h	34,8
SpO <sub>2</sub> baseline, %	96

**Breathing disorders statistics**

Event	Qty.	Duration, s	Index, /h	% from TRT	Avr. dur., s	Max. dur., s	On back	Index On back, /h	Not on back	Index Not on back, /h
O. apnea	123	43	28,2	16,9	21	52	86	32,1	37	15,8
C. apnea	1	0	0,2	0,1	13	13	1	0,4	0	0,0
M. apnea	0	0	0,0	0,0	0	0	0	0,0	0	0,0
Apnea total	124	43	28,4	17,1	-	-	87	32,4	37	15,8
O. hypopnea	236	77	54,1	32,5	20	52	55	20,5	181	77,2
C. hypopnea	0	0	0,0	0,0	0	0	0	0,0	0	0,0
Hypopnea total	236	77	54,1	32,5	-	-	55	20,5	181	77,2
A+H	360	120	16,6	49,5	-	-	142	52,9	218	93,0

**SpO<sub>2</sub> statistics**

SpO <sub>2</sub> baseline, %	96
Minimal SpO <sub>2</sub> level, %	77
Average SpO <sub>2</sub> level, %	95

**Desaturation episodes statistics**

Value	3 - 4%	5 - 10%	11 - 15%	16 - 70%
Quantity	217	182	48	13

**Cardiac statistics**

Minimal HR level, bpm	64	Average HR level, bpm	69		
ECG events	Qty.	Index, /h	Total duration, m.	Avr. duration, s.	Max. duration, s.
Tachycardia	10	1,4	2	11	22
Bradycardia	114	15,7	34	18	35
Asystole	0	0,0	0	0	0

**HR by body positions, bpm**

Body position	Min.	Avr.	Max.
On back	63	71	86
Not on back	40	69	86
Left	60	68	86
Right	40	70	86
Chest	55	69	86

**Arousal Statistics**

Arousals	Qty.	Index, /h	Dur., s.	Avr. dur., s.	Max. dur., s.
Autonomic arousals	253	34,8	51	12	31

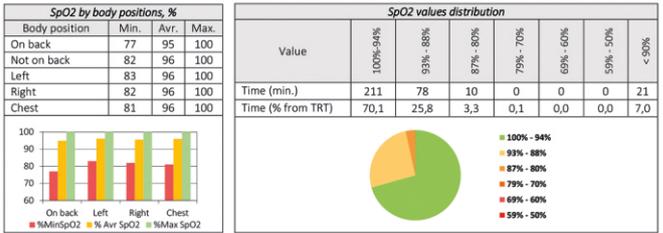
**Limbs movements statistics**

Limbs movements				Periodic limbs movements	
Events	Qty.	Index, /h	Events	Qty.	Index, /h
LM	6	0,8	PLM	71	9,8

**Body positions statistics**

On back	0	0,0	On back	32	11,9
Not on back	6	2,6	Not on back	39	16,6
Right	2	1,5	Right	11	8,4
Chest	0	0,0	Chest	28	0,0
Left	4	3,8	Left	0	0,0

Sleep signal recorder "ApnoX" 10

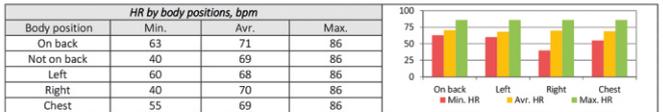


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Left	4	3,8	Left	0	0,0

Sleep signal recorder "ApnoX" 10

The following screen forms are included in the protocol:

- charts (trends of calculated parameters);
- sleep events (list of events and their marks on time scales).

Preparation and printing of the study protocol includes:

- Automatic study protocol in MS Word format;
- Print recorded data and results of processing from software using the Print Manager.



## Video monitoring

Digital video recording of the sleeping patient, accurately synchronized with the recorded signals and indicators, allows you to compare the clinical manifestations of sleep disorders with the position of the body and movement of the patient's limbs.

Data recording can be performed offline (with recording onto a memory card) or in telemetric mode (with data transmission to a computer via a wireless channel).

## Contact information

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