

# RESMED

## ApneaLink™ / ApneaLink Plus Home Sleep Test Screening and Diagnostic Devices

Simple, fast and easy to use.



# ResMed's ApneaLink™ devices are the easy choice in OSA diagnosis

## Simple, cost-effective and reliable results.

The ApneaLink™ improves patient care by providing easy access to treatment while helping you grow your sleep apnea business.

### Accessories



**ApneaLink Plus**  
Type III Device



**ApneaLink**  
Type IV Device

## Feature Comparison ApneaLink vs ApneaLink Plus

	ApneaLink	ApneaLink Plus
Apnea-hypopnea index	●	●
Risk indicator	●	●
Apnea index	●	●
<b>UAI</b> (Unclassified apnea index)	●	●
<b>OAI</b> (Obstructive apnea index)		●
<b>CAI</b> (Central apnea index)		●
<b>MAI</b> (Mixed apnea index)		●
Hypopnea index	●	●
Flow lim br without sn (FL)	●	●
Flow lim br with sn (FS)	●	●
Snoring events	●	●
ODI (Oxygen desaturation index)	Optional with oxymetry	●

### All ApneaLink devices features:

**Automatic analysis** derives apnea-hypopnea index (AHI), hypopnea index (HI), flow limitation, snoring and oxygen desaturation index (ODI)

**Validated results meet AASM and CMS definitions** for hypopnea scoring guidelines

**Cheyne-Stokes probability detection** determines when to refer patients for further in-lab diagnosis

**Manually score results** for more detailed patient results

**Add your business logo** to increase your brand awareness

**Email summary and signal reports** can be sent to referral physicians or other relevant parties

**Patient instructions** can be printed when programming the device

**Extended report** contains additional overview of respiratory data


# ResMed's ApneaLink Plus is simple, fast and easy to use

## New features for clearer diagnosis, time savings and potential increased reimbursement.

The ApneaLink Plus with EasySense technology, a unique respiratory effort sensor, is a simple, low-cost portable home sleep test diagnostic device that records up to four channels of information: [respiratory effort](#), [pulse](#), [oxygen saturation](#) and [nasal flow](#).

- Effort belt with EasySense respiratory effort sensor
- Enhanced recorder light status; improved start/stop button
- Simple, easy-to-use component connectors
- Same robust design as ApneaLink

Your Logo Here



ApneaLink - Report of 05.05.2009 11:48

**Treating physician**

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**Referral to**

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**Patient data**

First name:	Sample 2	Patient ID:	
Name:	Sample 2	DOB:	17.02.1932
Street:		Size:	168 cm
City, ST., Zip:		Weight:	81 kg
Phone:		BMI:	28.7 kg/m <sup>2</sup>

**Recording**

Date: 19.12.2008

Start: 21:40

End: 05:36

Duration: 7 h 56 min

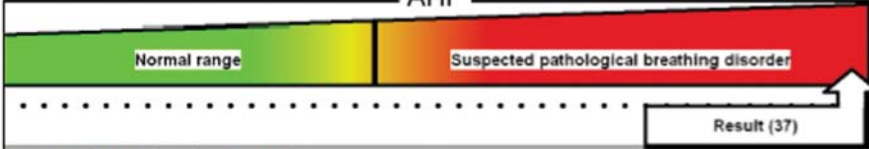
**Evaluation**

Start: 21:50

End: 05:34

Duration: 7 h 40 min

**AHI\***



Normal range      Suspected pathological breathing disorder

Result (37)

\*Points evaluation from AHI (see Clinical Guide for more details)

**Analysis** (Flow evaluation period: 7 h 40 min / SpO<sub>2</sub> evaluation period: 7 h 45 min)

	Normal		Result		
<b>Indices</b>					
AHI <sup>†</sup> :	37	< 5 / h		Average breaths per minute (bpm):	10.28
RI <sup>†</sup> :	39	< 5		Breaths:	4723
Apnea Index:	30	< 5 / h		Apneas:	226
UAI:	0			Unclassified apneas:	0 (0%)
OAI:	2			Obstructive apneas:	15 (7%)
CAI:	28			Central apneas:	211 (93%)
MAI:	0			Mixed apneas:	0 (0%)
Hypopnea Index:	7	< 5 / h		Hypopneas:	51
% Flow lim. Br. without Sn (FL):	32	< Approx. 60		Flow lim. Br. without Sn (FL):	1532
% Flow lim. Br. with Sn (FS):	0	< Approx. 40		Flow lim. Br. with Sn (FS):	3
				Snoring events:	293
ODI Oxygen Desaturation Index <sup>†</sup> :	35	< 5 / h		No. of desaturations:	271
Average saturation:	94	94% - 98%		Saturation ≤ 90% :	14 min (3%)
Lowest desaturation:	86	-		Saturation ≤ 85% :	1 min (0%)
Lowest saturation:	---	90% - 98%		Saturation ≤ 80% :	0 min (0%)
Baseline Saturation:	98	%		Saturation ≤ 85% :	6 min (1%)
Minimum pulse frequency:	52	50 - 70 bpm		Saturation ≤ 88% :	3 min (1%)
Maximum pulse frequency:	145	60 - 90 bpm			
Average pulse frequency:	59	bpm			
Proportion of probable CS epochs:	0	0%			

Analysis status: Edited manually

**Analysis parameters used (Default)**

Apnea [20%, 10s, 80s, 1.0s, 20%, 80%, 8%], Hypopnea [70%, 10s, 100s, 1.0s], Snoring [8.0%, 0.3s, 3.5s, 0.5s], Desaturation [4.0%], CSR [0.50]

**Comments**

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### ApneaLink Plus additional features:

**Differentiation of apneas** leads to clearer diagnosis and more accurate, effective reports

**New prescription page** streamlines process for healthcare professionals

**AHI graphic and risk indicator** can highlight either AHI or RI

**Configurable analysis parameters** allow for the adjustment of obstructive and central apnea thresholds

**Five measurements of oxygen saturation including ≤ 89 and ≤ 88** allow for accurate billing documentation

## ORDERING INFORMATION & PRODUCT CODES

### ApneaLink Plus Complete Set

(includes respiratory effort and oximetry)

- ApneaLink Plus recorder device
- Program CD software
- Quick software setup guide
- USB download cable
- ResMed EasySense respiratory effort sensor
- 2 reusable belts
- XPOD oximeter sensor clip
- ResMed XPOD oximeter
- 3 single-use oximeter sensors
- 3 nasal cannulas
- Carrying case
- 2 AA batteries

**US and Latin America** 22328

**Canada** 22327

### ApneaLink Plus Basic Set

(includes respiratory effort)

- ApneaLink Plus recorder device
- Program CD software
- Quick software setup guide
- USB download cable
- ResMed EasySense respiratory effort sensor
- 2 reusable belts
- 1 nasal cannula
- Carrying case
- 2 AA batteries

**US and Latin America** 22319

**Canada** 22323

### ApneaLink Basic Set

- ApneaLink recorder device
- Program CD software
- Quick software setup guide
- USB download cable
- 1 reusable belt
- 3 nasal cannulas
- Carrying case
- 2 AA batteries

**US and Latin America** 22302

**Canada** 22303

### ApneaLink Oximetry Accessories Kit

- ResMed XPOD oximeter
- XPOD oximeter sensor clip
- 3 single-use oximeter sensors

**US and Latin America** 22304

**Canada** 22308

## ACCESSORIES

### ApneaLink Plus (only)

**ResMed EasySense Respiratory effort sensor** 22333

**Belt, reusable stretch (required)** 629052

### ApneaLink Plus and ApneaLink Software

(compatible with all devices) 22325

### Other Optional Accessories and Disposables

**Belt, single use (24 pack)**  
(for use with ApneaLink only) 70406

**Nasal cannulas (25 pack)** 70388

**Nasal/oxygen cannulas (25 pack)** 70319

### Oximetry Components

**Oximeter soft sensor, reusable**  
(recommended) 70413

**Oximeter sensor – single-use** 70412

**XPOD oximeter sensor fixation clip** 22306

## TECHNICAL SPECIFICATIONS

### Signal Recording

- Respiratory effort
- Respiratory flow
- Breathing sounds
- Blood-oxygen saturation
- Pulse
- Battery voltage

### Sampling Rates for the Channels

- Respiratory flow / breathing sounds: 100 Hz
- Blood-oxygen saturation: 1 Hz
- Pulse: 1 Hz
- Battery: 1 Hz
- Respiratory effort: 10 Hz

### Signal Processing

- Signal recording: 20 Bit
- Signal storage: 16 Bit

### Internal Memory

- Storage capacity: 15 MB
- Recording period: 8 hours minimum

### Power Supply to Recorder

- 2 batteries: LR 6 / Mignon / AA / 1.5 V / at least 2100 mAh
- 2 NiMH rechargeable batteries: Mignon / AA / 1.2 V / at least 2100 mAh

### Dimensions (length x width x height)

- Recorder: 4.6" x 2.4" x 1.2" (125 x 60 x 30 mm)
- Pulse oximeter: 2.1" x 0.8" x 0.6" (53 x 20 x 15 mm)

### Weight\*

- Recorder (without batteries): Approx. 50 g (1.8 oz)
- Pulse Oximeter: approx. 30 g (1.1 oz)

\*Recorder without batteries

### Operating Conditions

- Temperature: 68°F to 104°F (20°C to 40°C)
- Humidity: 10% to 90% RH (non-condensing)

### Shipment/Storage Conditions\*

- Temperature: -4°F to +122°F (-20°C to +50°C)
- Humidity: 10% to 90% RH

### Operating/Storage Air Pressure

- 800 hPa to 1060 hPa

### Effective Range

- Flow sensor: -10 hPa to +10 hPa
- SpO<sub>2</sub>: 70 to 100%
- Pulse: 18 to 300 bpm

### Accuracy (No Movement)

- SpO<sub>2</sub>: +/- 3 digits
- Pulse: +/- 3 digits

### Interfaces

- Nasal pressure cannula: Luer connection
- Pulse oximeter: 3-pin binder plug
- Computer: Full speed USB 1.1

## ApneaLink Plus featuring EasySense technology

Sleep-disordered breathing (SDB) is recognized as a serious health problem that impacts approximately 43 million US adults. More than 80% remain undiagnosed, and many barriers prevent patients from getting access to therapy.<sup>1</sup>

Now, the detection of this chronically debilitating condition has been made easier with the ApneaLink Plus, a Type III home sleep testing diagnostic device, the latest addition to the ApneaLink family of diagnostic products and accessories.

The ApneaLink devices provide you with a cost-effective, easy-to-use method of diagnosing or screening patients for obstructive sleep apnea (OSA) in the home. The device reports apneas, hypopneas, flow limitation, snoring, blood oxygen saturation and the probability of Cheyne-Stokes respiration (CSR) breathing patterns within the recording.



<sup>1</sup> Young et al. State of the Art, *AJRCCM* 2002



# Detailed Signal View

## Full night view

Signals:

Nasal flow

Snore

Respiratory effort

Oxygen saturation

Pulse



Adjustable signal amplitude

## Expanded view

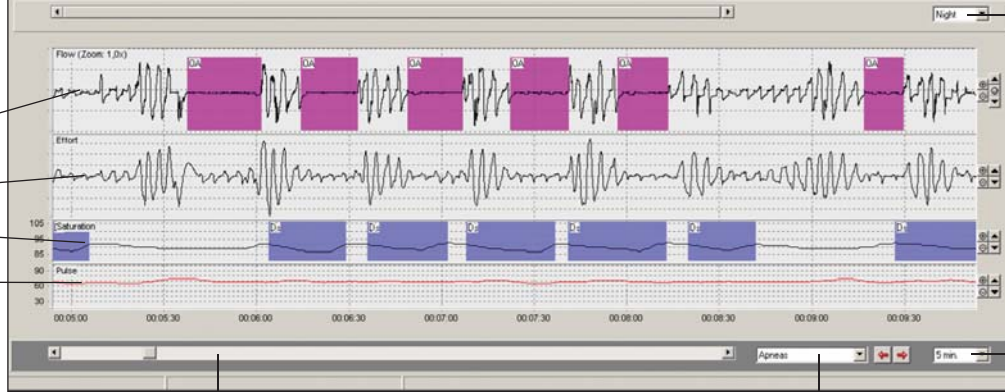
Signals:  
(Selectable)

Nasal flow

Respiratory effort

Oxygen saturation

Pulse



Selectable time

Selectable time

Time select bar

Event type selection

## The ApneaLink and ApneaLink Plus have been validated in several studies worldwide

### Validation of MicroMESAM\* as screening device for sleep-disordered breathing

(Wang Y, Teschler T, Weinreich G, Hess S, Wessendorf TE, Teschler H)

MicroMESAM-generated flow-time curves correspond well with pneumotachograph-generated curves, producing automated AHIs\*\* that are highly sensitive in detecting SDB.

### Validation of ApneaLink as screening device for Cheyne–Stokes respiration.

(Weinreich G, Armitstead J, Töpfer V, Wang YM, Teschler, H)

The study demonstrated that the screening classifier was able to detect CSR with high diagnostic accuracy. Hence, the ApneaLink equipped with the CSR classifier is an appropriate screening tool that may help to prioritize patients with CSR for a polysomnography (PSG).

### Validation of the ApneaLink for the screening of sleep apnea: A novel and simple single-channel recording device

(Erman MK, Stewart D, Einhorn D, Gordon N, Casal E)

The ApneaLink device provides reliable information, is simple to use, and is highly sensitive and specific in calculating AHI when compared with the AHI obtained from a full PSG.

### Validation of ApneaLink Plus

Compared with the gold standard RIP technology using single-use RIP belts under a PSG study, the information provided by the ResMed ApneaLink Plus pneumatic sensor is equivalent, while the application of the sensor appears to be much simpler. The algorithms to detect respiratory events worked properly and reliably through the entire study. The correlation between PSG results and ApneaLink Plus results was good at any time. The differentiation between the apnea event types showed a good correlation compared to manual apnea scoring in the PSG.

\* Distributed by ResMed as the ApneaLink in the US

\*\* Values reported as AHI for MicroMESAM (ApneaLink) are actually RDI values (AHI plus flow limitation). See full translated article for details.