MIR
MEDICAL INTERNATIONAL RESEARCH

# Spirodoc®

## One Touch Laboratory for respiratory analysis
### two functional modes: doctor and patient


reddot design award
winner 2010 – 2011

## Four devices in one, italian design

**Spirometer**
with "Touch Screen" display

**Pulse Oximeter**
"intelligent" with on screen results

**3D Accelerometer**
with motion analysis for $O_2$ prescription


**Questionnaire**
for home care symptom control

www.spirometry.com www.oximetry.com

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# Spirodoc®


*Spirometry menu in "Doctor mode"*

## Complete Spirometer ATS/ERS compliant

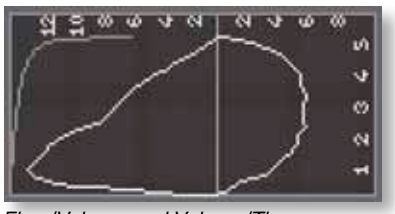
### Specialist-level analysis, screening and home care monitoring

The New Spirodoc® has been developed with great attention both to design and technology, with various operation modes: "advanced" parameters for the specialist, "reduced" set of parameters for screening as well as a "simplified" version for Home Care operation.

FVC, VC, IVC, MVV, PRE-POST.
Precise spirometry interpretation including post bronchodilator.
All tests are automatically memorized.
Automatic BTPS conversion.
Memory capacity: 10.000 tests.
Wide selection of predicted values.


*Choice of spirometric parameters*


*Patient data entry*



*Flow/Volume and Volume/Time curves*

### FlowMIR®: disposable turbine

Spirometry requires maximum accuracy and hygiene. FlowMir® is the answer to both requirements. Each turbine is calibrated with a computerized system and it is packaged individually. After patient testing both the turbine and mouthpiece are thrown away. In this way 100% hygiene can be guaranteed.

### Option available: reusable turbine

The accuracy and the precision of the reusable turbine remains unchanged even over time.

**www.spirometry.com**

**SPIRO DETACHABLE HEAD**

**Spirometry option.**
Flow and volume measurements made by digital turbine system for a reliable result.




*Paediatric and adult finger probe*

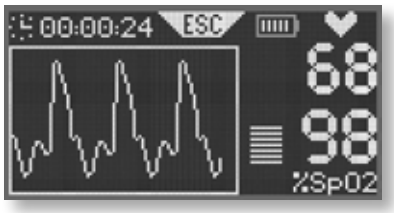
*Neonatal flex probe*

# Intelligent Pulse Oximeter with on-screen results

## 6MWT with new O2 Gap Index (MIR patent pending)

Simple, clear SpO2 and Pulse Rate measurements with plethysmographic curve. During the single six-minute walk test (6MWT), Spirodoc® estimates the level of oxygen therapy required by the patient. Innovative and essential in pneumology, cardiology and rehabilitation etc.

*Belt with silicon holder (option).*




*Plethysmographic Curve*


*Oximetry Menu*


*Patient Data Entry*

## Day and night

Spirodoc® carries out sleep desaturation studies and memorizes events as well as body position.


*Parameter Choice*

# One Touch Laboratory for respiratory analysis


Spirodoc® is the first **3D Oximeter®** incorporating a triaxial motion sensor to correlate the saturation level (%SpO2) with physical activity (walk counter, movement analysis and VMU).


# Ideal for rehabilitation, telemedicine and clinical trials

## 3D accelerometer with motion analysis

Spirodoc® conforms to the **EU guidelines for Telemedicine and COPD**:

- respiratory function **(spirometer)**
- desaturation analysis **(pulse oximeter)**
- daily questionnaire **(symptoms)**
- physical activity **(3D accelerometer)**

Spirodoc® has all of these features.

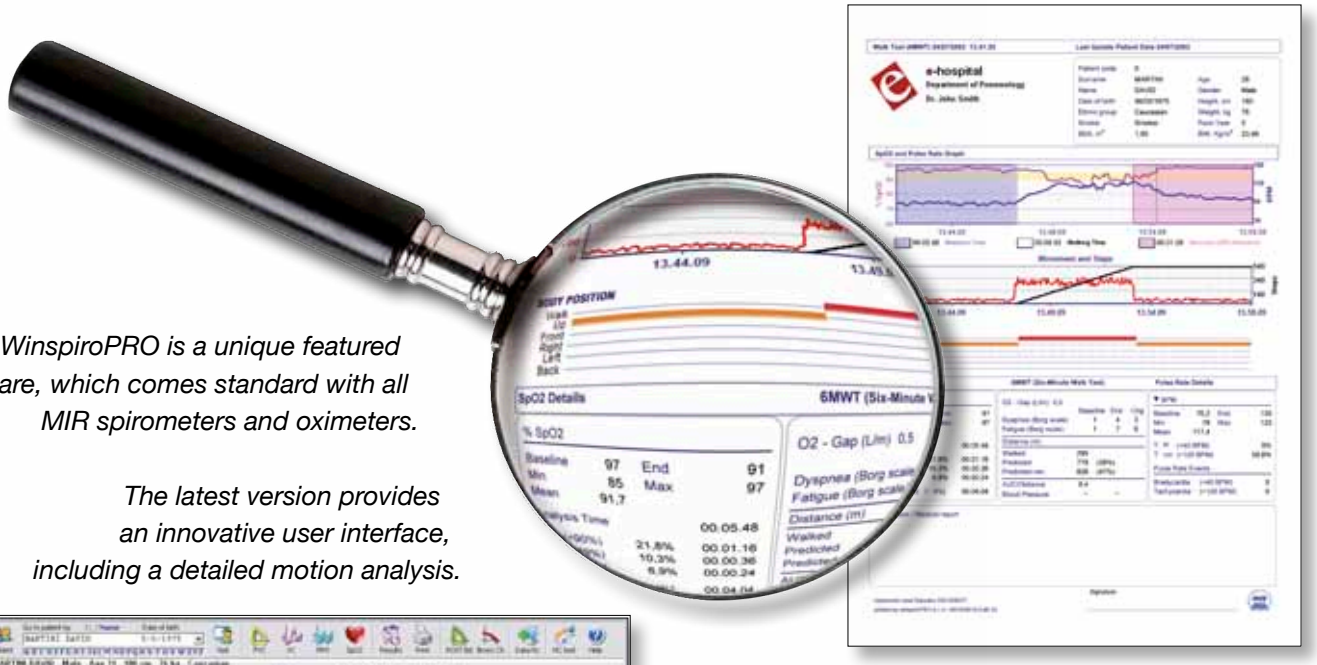
## Home-care symptoms diary

Fast on-screen symptoms entry. Complete touch screen with settable questions and automatic answer recording for homecare patient use **(eDiary)**.

## Respiratory rehabilitation and Activity Monitoring

According to the latest ATS COPD Guidelines, it is fundamental that, for patients with respiratory diseases, the level of exercise during the rehabilitation phase can be studied.

## Telemedicine Anywhere




*WinspiroPRO is a unique featured PC software, which comes standard with all MIR spirometers and oximeters.*

*The latest version provides an innovative user interface, including a detailed motion analysis.*

*Printout of the 6 minute walking test: baseline, walk, recovery*

*Summary of all tests carried out*

### Comprehensive patient records

*All patient physical activity records as well as body position are shown on simple, single-screen patient cards, with dynamic management of all data and graphs including SpO2 measurements during the corresponding test (6MWT, Sleep, Stress Test…).*

# WinspiroPRO now available with HL7 interface

## High performance PC software for spirometry and oximetry

All results can be rapidly printed.
All tests memorised in Spirodoc® are automatically downloaded into winspiroPRO and a patient data card is automatically created with a preview of the spirometry curve.

The spirometry incentive routine, patented by MIR, allows the user to select the patient's favourite image in order to get maximum compliance.

WinspiroPRO can easily be connected to a database, EPR, hospital or occupational health system. Special edition with HL7 interface is available on request.

This software also gives trend graphs of any parameter, ideal for clinical trials and telemedicine.

All tests and curves for every patient in the memory can be reviewed on a single page and the results, including oximetry tests, can be compared.


*Printout of sleep oximetry with desaturation analysis*

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# Spirodoc®

## Spirometer technical specifications

Flow sensor: bi-directional digital turbine
Flow range ±16L/s
Volume accuracy: ±3% o 50mL, whichever is greater
Flow accuracy: ±5% o 200mL/s, whichever is greater
Dynamic resistance at 12L/s: <0.5cmH2O/L/s
Temperature sensor: semiconductor (0-45°C)

## Spirometer measured parameters

FVC, FEV1, FEV1/FVC%, FEV3, FEV3/FVC%, FEV6, FEV1/FEV6%, PEF, FEF25%, FEF50%, FEF75%, FEF25%-75%, FET, Estimated Lung Age, Extr. Vol., FIVC, FIV1, FIV1/FIVC%, PIF, VC, IVC, IC, ERV, FEV1/VC%, VT, VE, Rf, ti, te, ti/t-tot, VT/ti, MVV measured, MVV calculated

## Central unit technical specifications

Display: LCD Backlit Touch screen Display:
Resolution: 128x64 pixels
Power supply: Lithium ion 3.7V, 1100mA rechargeable battery with 30 hours measurement back-up
Data transmission: USB 2.0 (Bluetooth® optional)
Accelerometer: Triaxial ± 2g, 400Hz sampling
Dimensions and weight: central unit 101x48x16mm, 99g
removable turbine head: 46x47x24mm, 17g
Battery charger (optional): 100VAC - 240VAC, 50Hz-60Hz
output 5VDC, 500mA, micro USB type B

## Pulse-oximeter technical specifications

SpO2 range: 0-100%
SpO2 accuracy: ±2% (50-100% SpO2)
Pulse rate range: 20-254BPM
Heart rate accuracy: ±2BPM or 2%, whichever is greater

## Pulse-oximeter measured parameters (standard)

SpO2 [Baseline, Min, Max, Mean], Pulse rate [Baseline, Min, Max, Mean], T90% [SpO2<90%], T89% [SpO2<89%], T88% [SpO2<88%], T5% [ΔSpO2>5%], ΔIndex [12s], SpO2 Events, Pulse rate events [Bradycardia, Tachycardia], Step counter, Movement [VMU], Recording time, Analysis time

## Sleep analysis (specific parameters)

Body position, SpO2 Events, Desaturation index (ODI), Desaturation [Mean Value, Mean duration, Longest duration, Nadir Peak], ΔSpO2 [Min Drop, Max Drop], Total Pulse Variations, Pulse Rate Index, NOD89% [SpO2<89%; >5min], NOD4% [SpO2 Basale-4%; >5min], NOD90% [SpO2<90%; Nadir<86%; >5min]

## 6MWT (6 Minute Walk Test specific parameters)

$O_2$-Gap, Estimated distance, Distance walked, Predicted distance [Min, Standard], TΔ2% [SpO2≥2%], TΔ4% [ΔSpO2≥4%], Time [Rest, Walking, Recovery], Desaturation Area/Distance
***Optional data entry:*** *Borg Dyspnea [Baseline, End, Change], Borg Fatigue [Baseline, End, Change], Arterial blood pressure [Systolic, Diastolic], Oxygen administered*


**MIR - Medical International Research USA, Inc.**
1900 Pewaukee Road, Suite O
Waukesha, WI 53188
Phone: (262) 565-6797 - Fax: (262) 364-2030
mirusa@spirometry.com

**MIR Medical International Research**
Via del Maggiolino, 125
00155 Roma (Italy)
Tel. +39 06.22754777 - Fax. +39 06.22754785
mir@spirometry.com





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