

# Minispir®

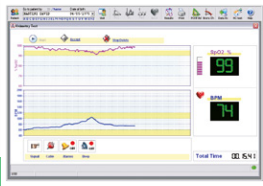
The most convenient way to access spirometry and oximetry data in one small device



## Fast, Simple and Accurate



**PC based Spirometer**  
Plugs directly into the USB socket on your PC.



**Online Oximetry (option)**  
SpO2 and Pulse Rate analysis with several printouts available.



**A multitask mini-laboratory**  
Performant solution for all: Family Doctors, Occupational Health, Specialists.



**OEM solutions**  
Ideal and easy custom made applications.

# Minispir®



## PC based Spirometer

Plugs directly into the USB socket on your PC.  
 On line PC connection with icon-based interface.  
 Real time Flow/Volume and Volume/time curves.  
 PRE-POST bronchodilator comparison.  
 Advanced spirometry test interpretation.  
 Pediatric incentive animations.  
 Lung age estimation.  
 Bronchial challenge test with FEV1 dose-response curve.  
 Temperature sensor for automatic BTPS conversion.  
 Selectable languages and predicted values.  
 Easy data export also via e-mail.  
 No batteries required.



## Online Oximetry (option)

Minispir® calculates all parameters referred to in peer reviewed scientific literature (ie: min, max, mean SpO2 and Pulse Rate, Delta Index, T90%, T89%, T88%, T5 etc.).  
 Flexible reporting with several printouts available.

## A multitask mini-laboratory

Using a Laptop Minispir® allows complete portability for any application. It can be easily linked to Family Doctors, Occupational Health systems or other Specialist and Hospital medical databases.



## OEM Spirometer/Oximeter

Ideal and easy solution for custom made USB applications. It is used worldwide to provide the most appropriate answer to all your spirometry and oximetry integration requirements.  
 OEM Development Kit included.

# New WinspiroPRO

High performance PC software for spirometry and oximetry

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

Minispir® Plugs directly into the USB socket on your PC and it connects on line with winspiroPRO.

Network Version available.

WinspiroPRO can easily be linked to a database or to an EMR, hospital or occupational health system.

This software also gives trend of any parameter so is ideal for clinical trials and telemedicine.

**Pulmonary Function Test Results**

**e-hospital**  
Department of Pneumology  
Dr. John Smith

Visit date 24/07/2003

Patient code 0  
Surname MARTINI Age 28  
Name DAVID Gender Male  
Date of birth 06/05/1975 Height, cm 180  
Ethnic group Caucasian Weight, kg 76  
Smoke Smoker Pack-Year 5  
Patient group

**Interpretation**  
Normal Spirometry

**Conclusion / Medical report**

**Flow / Volume Loop and Volume / Time Curve**

PRE Trial date 24/07/2003 14:34:17

Parameters	BTPS 1.092 25°C - 77°F	Pred	PRE	%Pred	POST	%Pred	%Chg	PRE#1	PRE#2	PRE#3
Best values from all loops										
FVC	L	5,43	5,68	105				5,45	5,68	5,47
FEV1	L	4,49	5,12	114				5,06	5,12	4,85
FEV1/FVC	%	83,2	90,1	108				92,8	90,1	88,7
PEF	L/s	9,77	12,90	132				12,90	11,91	11,73
Values from best loop										
FEF2575	L/s	4,71	7,33	156				7,33	6,38	5,88
FEF25	L/s	9,07	12,02	133				12,02	11,36	10,94
FEF50	L/s	5,56	7,21	130				7,21	6,55	6,23
FEF75	L/s	2,34	4,00	171				4,00	3,06	2,67
FEV3	L	5,04								
FET	s	6,00	2,06	34				2,06	2,78	2,88
FVC	L	5,43	5,41	100				5,41	5,78	5,56
FIV1	L	4,49	5,10	114				5,10	5,74	5,56
FIV1/FIVC	%	83,2	94,3	113				94,3	99,3	100,0
PIF	L/s	9,77	6,07	62				6,07	6,55	7,77
ELA	Years	33	33					33	33	33
EVC	L	5,43	6,11	113						
IVC	L	5,43								
RVLC	%	83,2	83,8	101						
ERV	L	1,77	2,06	116						
MCV	L	3,65	4,05	111						
ICV	L/min	149,5	164,2	110						

Signature \_\_\_\_\_ Instrument used Minispir MIR 610 003091

Printout: Spirometry report

**MARTINI DAVID** - Male - Age 31 - 180 cm - 76 kg - Caucasian

Visit Card Valid from 7/24/2003

**Spirometry**

Parameters	PFE	Pred.	%Pred	PFE#1	PFE#2	PFE#3
FVC	L	5,48	5,43	98,47	5,48	5,47
FEV1	L	4,47	4,49	100,59	5,06	5,17
FEV1%	%	80,11	81,2	102,21	92,1	94,1
PEF	L/s	12,3	5,77	132,91	12,3	11,91
FEF2575	L/s	7,33	4,71	156,74	7,33	6,38
FEF	s	2,86		2,86	2,78	2,88
FEF25	L/s	12,87	9,07	132,57	12,87	11,36
FEF50	L/s	7,21	5,56	129,68	7,21	6,55
FEF75	L/s	4	2,34	174,99	4	3,06
VEV1	ml	129		129	160	140
VEV6	L	0		0	0	0

**Oximetry** 7/24/03 13:41:25 Duration:00:17:44

SpO2 Mean	91,7	BPM Mean	117,4	Δ Index	4,5
SpO2 Min	85	BPM Max	70	CO2 Desaturation Index (1/s)	—
SpO2 Max	97	BPM Min	153	Distance (m)	990
T40 (<90%)	21,8%	T40 (<40 BPM)	0%	Baseline Dyspnea (Borg scale)	1
T80 (<89%)	10,3%	T120 (>120 BPM)	58,6%	End of Test Dyspnea (Borg scale)	4

Summary of all tests carried out

## Comprehensive patient records

All patient records are shown on simple, single-screen patient cards, with dynamic management of all data and graphs.

**Oximetry (SpO2/BPM) 24/07/2003 13:41:25**

Last Update Patient Data 24/07/2003

**e-hospital**

ID: WSPAB074827  
Last name MARTINI Age 28  
First name DAVID Jr Gender Male  
Date of birth 06/05/1975 Height, cm 180  
Ethnic group Caucasian Weight, kg 76  
Smoke Smoker Pack-Year 5  
BSA, m<sup>2</sup> 1,95 BMI, Kg/m<sup>2</sup> 23,46

**SpO2 Details**

Base	91,7	Mean	95,2
Min	85	Max	99
Δ Index	0,9		
Recording Time	00:17:44		
T40 (<90%)	7,1%	7,1%	00:01:16
T45 (<89%)	3,4%	3,4%	00:00:36
T50 (<87%)	2,2%	2,2%	00:00:24
SpO2 <89% Events	1		

**SpO2 and Pulse Rate Graph**

**Pulse Rate Details**

Base	76,7	Mean	97,7
Min	71	Max	135
T40 (<40 BPM)	0%		
T120 (>120 BPM)	24,4%		

**Pulse Rate Events**

Bradycardia (<40 BPM)	0
Tachycardia (>120 BPM)	3

**SpO2 Distribution**

% SpO2	Time %Time	Mean
95-100	00:12:20	69,3
90-94	00:04:09	23,2
85-89	00:01:20	7,5
80-84	00:00:00	0
75-79	00:00:00	0
70-74	00:00:00	0
<70	00:00:00	0

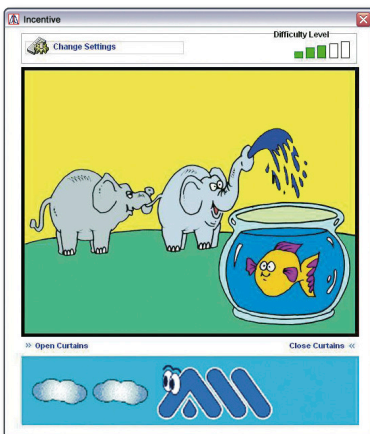
**Pulse Rate Statistics**

% BPM	Time %Time	Mean
140-149	00:00:00	0
130-139	00:01:16	7,1
120-129	00:03:16	18,4
110-119	00:01:16	7,1
100-109	00:11:12	6,7
90-99	00:02:26	16,5
80-89	00:02:28	13,9
70-79	00:05:24	30,3
60-69	00:00:00	0
50-59	00:00:00	0
40-49	00:00:00	0
30-39	00:00:00	0

**Events and settings**

- Base Line calculated in the last 3 minutes
- Desaturation if SpO2 < 89% for 10 seconds
- Bradycardia if BPM < 40 for 20 seconds
- Tachycardia if BPM > 120 for 20 seconds

Printout: Oximetry report



## Pediatric incentive animations

The spirometry incentive routine (MIR exclusive patent), allows the user to select the patient's favourite image in order to get his maximum compliance.

**Start** **Accept** **Stop/Delete**

**SpO2 %**  
99

**BPM**  
74

**Total Time** 00:15:41

Signal Cable Alarms Beep

Online oximetry measurement



# Minispir®

## MIR Turbine Flowmeters (comply with ATS/ERS standards)



### FlowMIR: disposable turbine

Spirometry testing 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. Only 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.



## Minispir® Spirometer

### Technical specifications

Temperature sensor: *semiconductor (0-45°C)*  
 Flow sensor: *bi-directional digital turbine*  
 Flow range:  $\pm 16$  L/s  
 Volume accuracy:  $\pm 3\%$  or 50 mL  
 Flow accuracy:  $\pm 5\%$  or 200 mL/s  
 Dynamic resistance at 12 L/s:  $<0.5$  cmH<sub>2</sub>O/L/s  
 Communication port: *USB*  
 Power Supply: *line powered from USB port*  
 Dimension: 2.1×5.0×1.0 inch (52×128×26 mm)  
 Weight: 2.5 Oz (70 gram)

### Measured parameters

*FVC, FEV1, FEV1/FVC%, FEV3, FEV3/FVC%, FEV6, FEV1/FEV6%, PEF, FEF25%, FEF50%, FEF75%, FEF25-75%, FET, Vext, Lung Age, FIVC, FIV1, FIV1/FIVC%, PIF, VC, IVC, IC, ERV, FEV1/VC%, VT, VE, Rf, ti, te, ti/t-tot, VT/ti, MVV*

## Minispir® Spirometer with SpO2 Opt

### Technical specifications

SpO<sub>2</sub> range: 0-99%  
 SpO<sub>2</sub> accuracy:  $\pm 2\%$  between 70-99% SpO<sub>2</sub>  
 Pulse Rate range: 30-254 BPM  
 Pulse Rate accuracy:  $\pm 2$  BPM or 2%

### Measured parameters

*SpO<sub>2</sub> [Baseline, Min, Max, Mean], Pulse Rate [Baseline, Min, Max, Mean], T90 [SpO<sub>2</sub><90%], T89 [SpO<sub>2</sub><89%], T88 [SpO<sub>2</sub><88%], T5 [ $\Delta$ SpO<sub>2</sub>>5%],  $\Delta$  Index [12s], SpO<sub>2</sub> Events, Pulse Rate Events [Bradycardia, Tachycardia]*

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