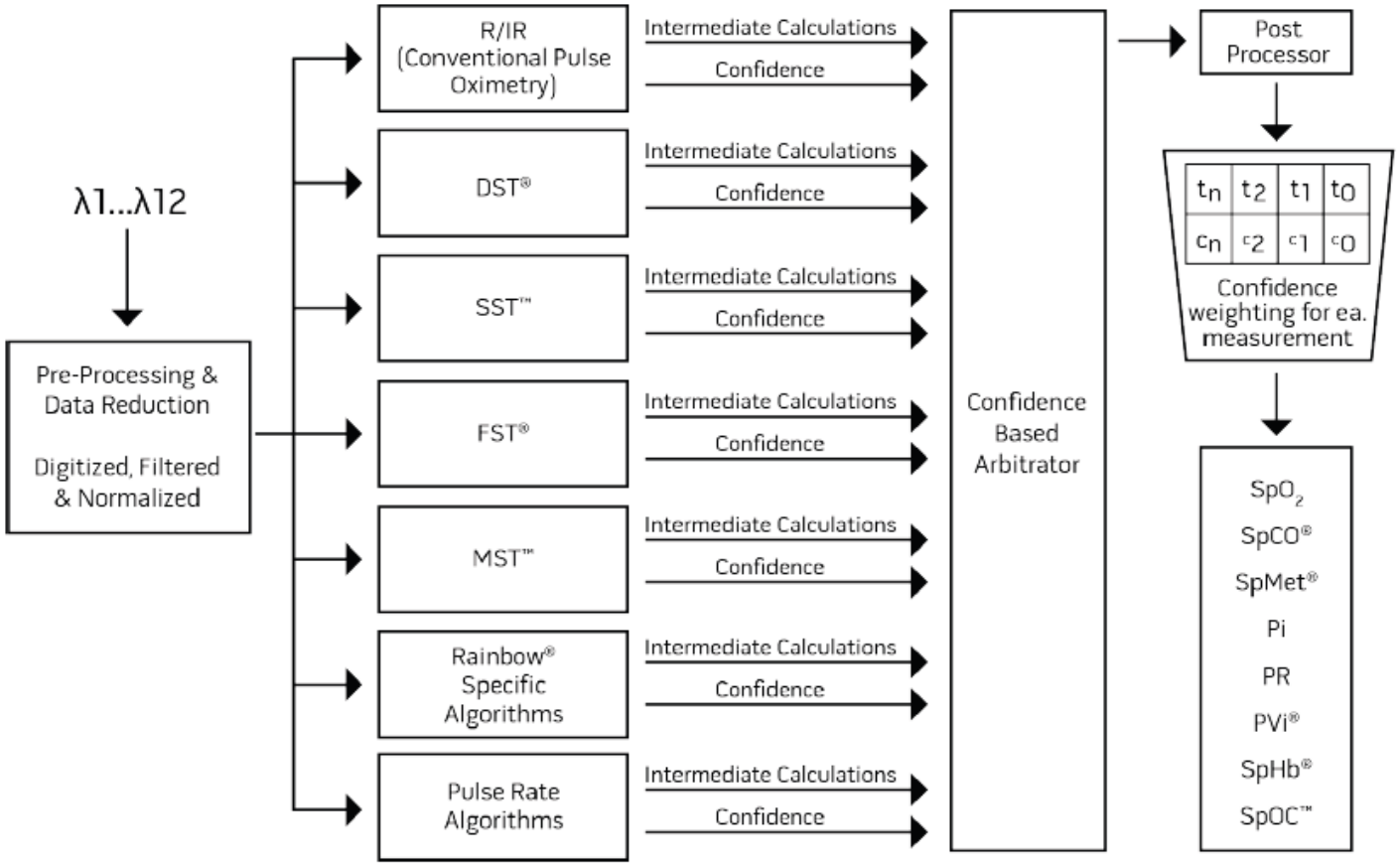
呼吸治療科Pulse Oximeter新機操作介紹

Masimo Rad-97

Masimo Technology Overview Rainbow SET

Masimo rainbow SET® Parallel Engines

This figure is for conceptual purposes only.



Discrete Saturation Transform® (DST®)

Fast Saturation Transform (FST®)

True arterial oxygen saturation

Masimo Technology Overview DST

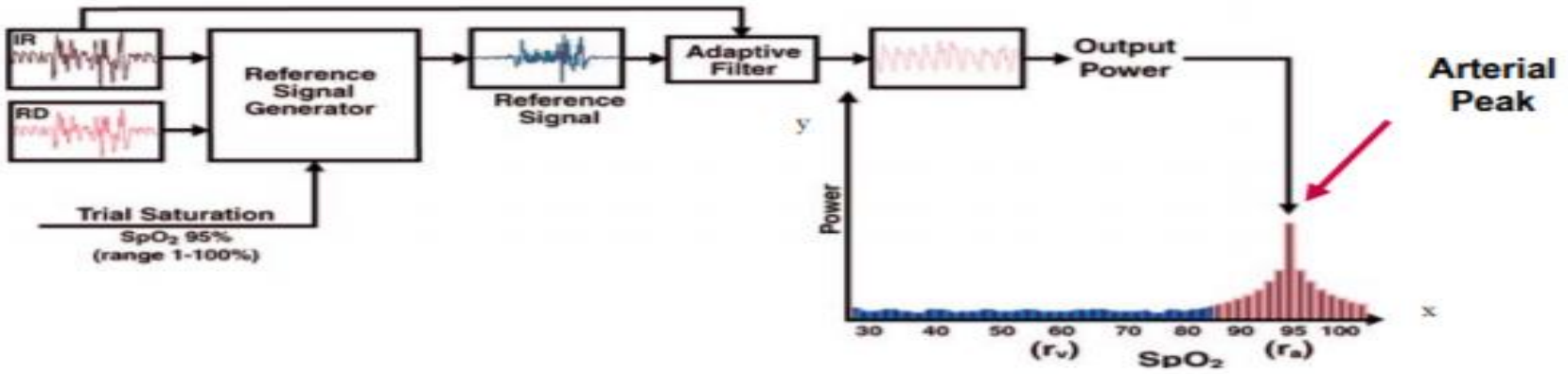
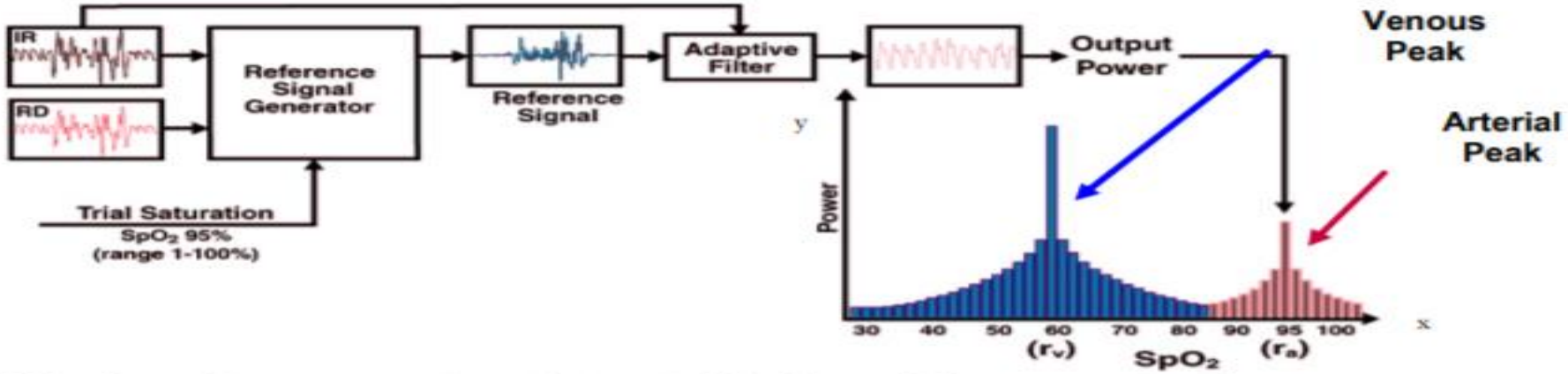


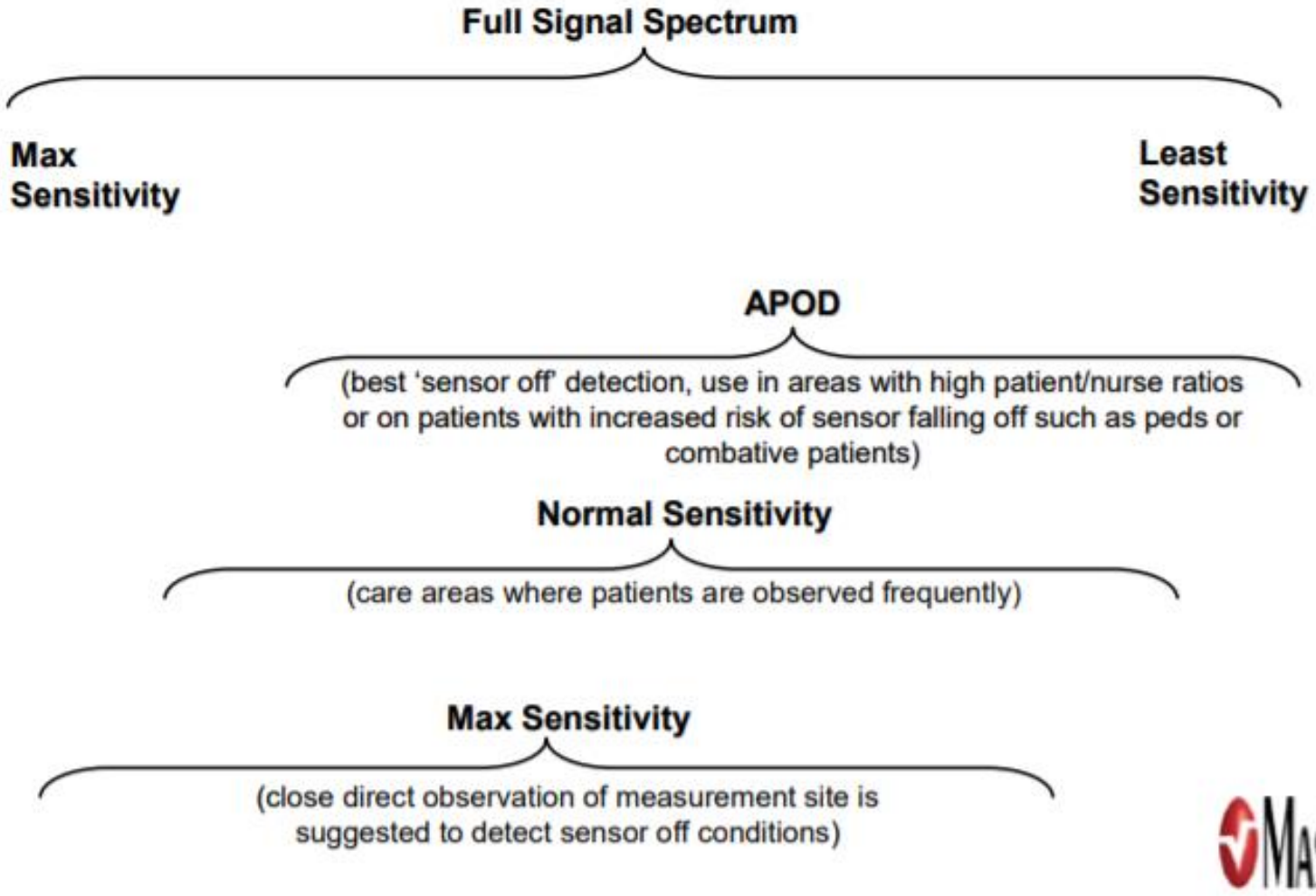
Figure 3.1:4 - The Discrete Saturation Transform (DST) without motion



DST makes only one assumption – that arterial blood has a higher oxygenation than venous – making it the most powerful pulse oximetry algorithm.

Masimo Technology Overview APOD

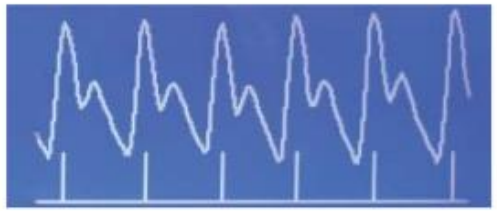
Adaptive Probe-Off Detection



PI<0.2

Masimo

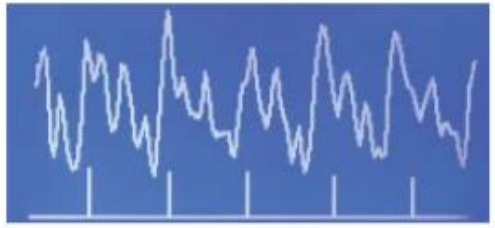
Masimo Technology Overview Signal IQ



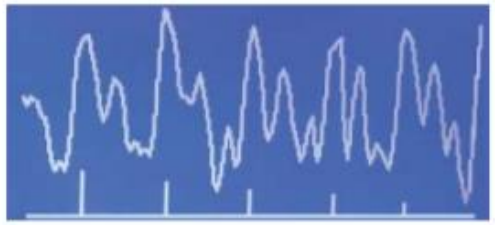
Pleth

Signal IQ 'spike' with each pulse

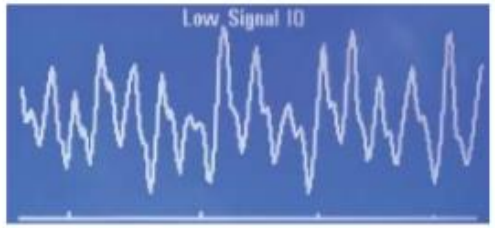
No motion, high SIQ, high reading confidence



Motion artifact, high SIQ, high reading confidence



Motion artifact, diminished SIQ and reading confidence



Excessive motion artifact, "Low Signal IQ" message indicates need to consider taking action

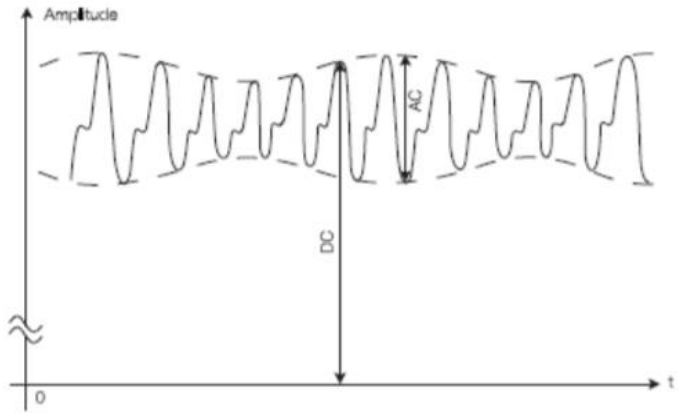
Masimo Technology Overview PI

Perfusion Index is a noninvasive and continuous measure of peripheral perfusion status (local blood flow) of the selected monitoring site and

- It is a measure of signal strength from the measurement site - not signal quality
- It is a measure of local vasomotor tone
- It is a relative number that falls between 0.02 – 20% with normal >1%.
- It varies between monitoring sites and from patient to patient, as physiologic conditions vary.
- Perfusion Index (PI) is the ratio of the AC of the DC component (see Equation 1 below)

Equation 1

$$PI = \frac{AC}{DC} \times 100\ \%$$



Perfusion Index (PI)

Clinically Powerful, But Under Recognized and Under Utilized

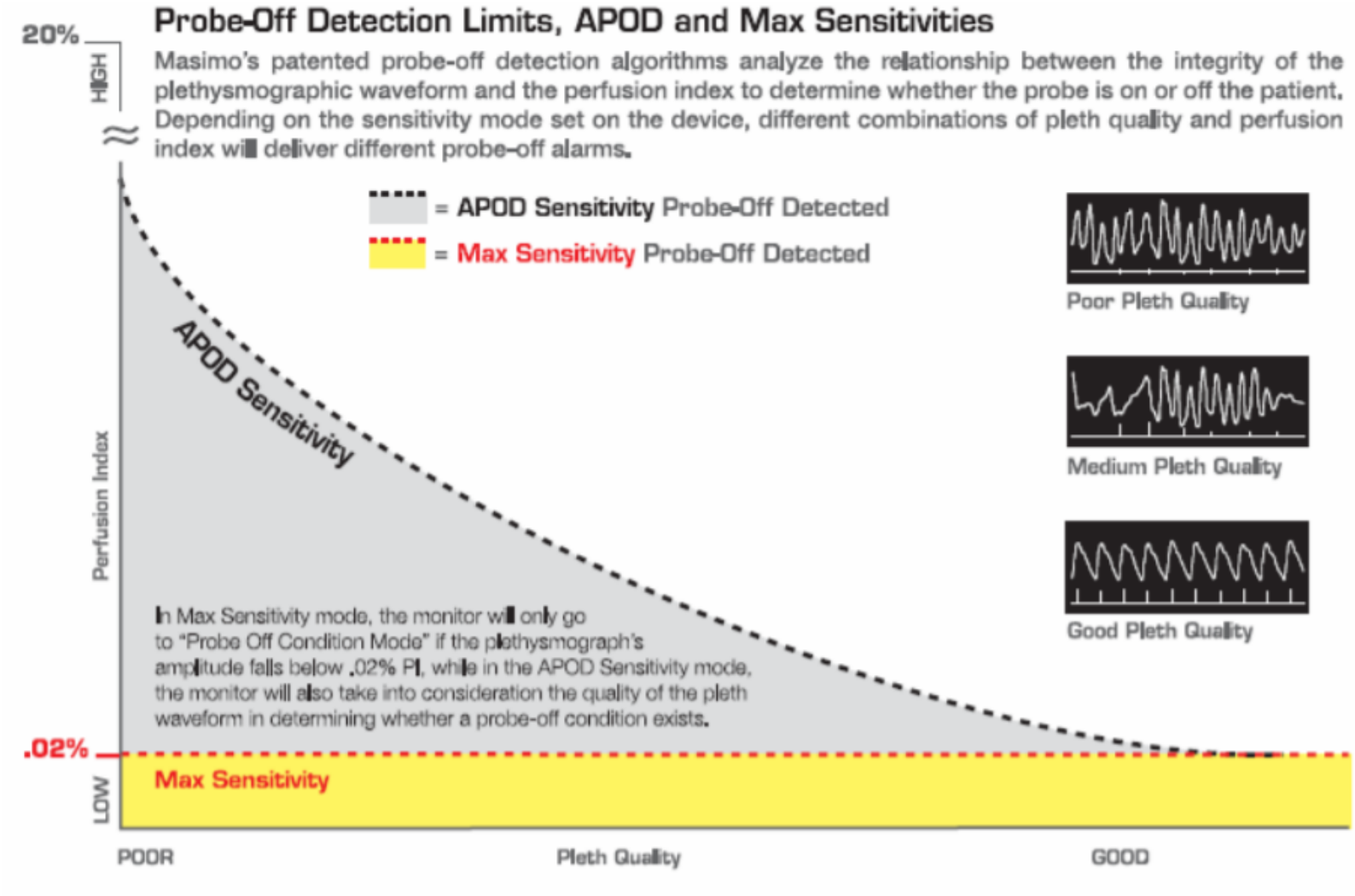
- 臨床問題 – 為什麼需要PI量測?

- 患者PI顯著下降可能具備顯著意義，表生理狀態發生變化
- 潛在的體溫過低，血容量不足，休克和/或敗血症。
- PI下降晚期常伴隨血壓下降的趨勢。
- 麻醉科醫師在給予降疼痛藥劑時的效益評估(Epidural infusions)

- PI新的臨床意義

- 疼痛新評估（對於患者疼痛感增加或減少連續性的變化觀察)無須患者意識反饋
- PI可比非侵入式血壓(peripheral blood pressure)更快且更容易得知病人血壓的變化

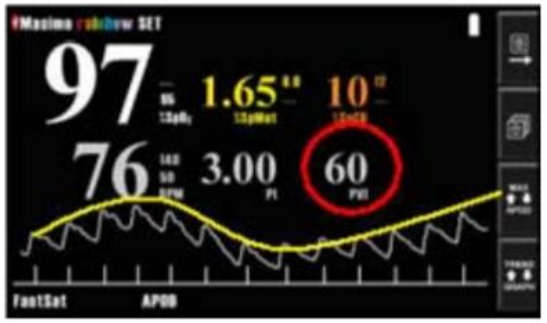
Masimo Technology Overview Signal IQ & PI



Masimo Technology Overview PVI

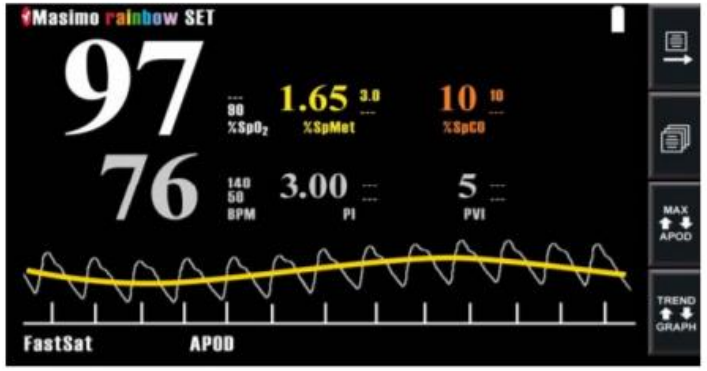
$$PVI = \frac{PI_{MAX} - PI_{MIN}}{PI_{MAX}} \times 100\%$$

Figure 3.6:1

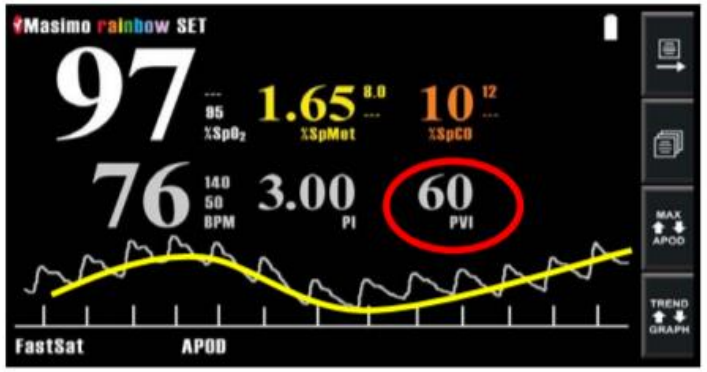


- Pleth Variability Index (PVI) is a measure of the dynamic changes in PI that occur due to respiration.
- It is calculated by measuring changes in PI over a time interval where one or more complete respiratory cycles have occurred.
- PVI is a percentage from 1 – 100; 1 represents no variability, and 100 represents maximum variability.
- PVI is a continuous noninvasive quantified measurement of changes in the plethysmographic waveform that may be indicative of blood volume status.

- In spontaneous breathing, BP decreases on inspiration. Normal peak decreases in systolic pressure has been reported between 5 – 10 mmHg. The slight variation can be seen in the pleth waveform below.

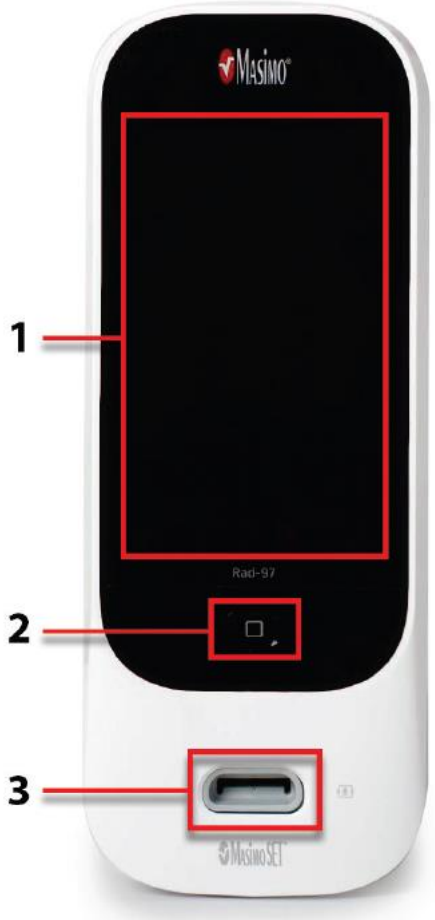


The exaggeration of this phenomenon, called pulsus paradoxus, reports pressure changes > 10 mmHg. The large variation can be seen in the pleth waveform below.



Features Rad-97

Front View



1. Display and Touchscreen

Provides a user interface to view and change settings.

2. Home Button

Provides a multipurpose user interface that allows for navigation to the home screen as well as turning the device on and off.

3. Patient Cable Port

Provides a connection to a patient cable or sensor.

4. NIBP Nib*

Allows connection to a cuff for blood pressure measurements.

5. NomoLine Capnography Input Connector*

Allows connection to NomoLine™ for capnography measurements. LEGI Indicator provides visual indications of capnography status. See ***NomoLine Capnography LEGI Indicator*** on page 60.

*Optional feature. Only available on Rad-97 equipped with NIBP or NomoLine Capnography capabilities.

Features Rad-97

Side and Top Views

1. Speaker

The speaker provides audio alarms. Care should be taken not to cover the speaker.

2. Swivel Foot

Provides stability when placing Rad-97 on a surface in a vertical position.

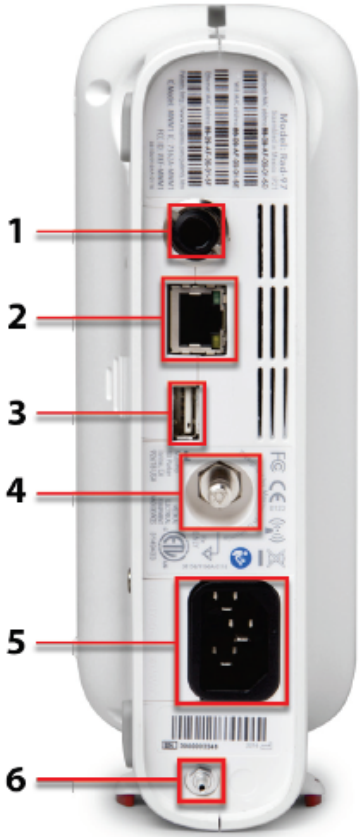
3. Foot Pads

Provides physical support to Rad-97 when placed on a surface in a horizontal position.

4. System Status Light

Provides an indication of alarm status. See ***About the System Status Light*** on page 59.

Back View



1. Nurse Call Connector

Allows connection to a Nurse Call system.

CAUTION: To ensure patient electrical isolation, all external device connections to the Analog Output/Nurse Call connectors must be IEC 60950-1, IEC 60601-1, or UL 1069 compliant.

See ***Nurse Call Connection*** on page 45.

2. Ethernet

Allows network connection to Rad-97 using an RJ-45 cable.

3. USB

Provides USB 2.0 connectivity.

4. Equipotential Ground Connector

Provides optional functional earthing for Rad-97 to eliminate potential differences between the earth connections for Rad-97 and another medical device. The use of the Equipotential Ground Connector should be in accordance with IEC 60601-1.

5. Power Entry Module

Provides connection to an AC power cord.

Note: Always connect the Rad-97 to the mains power for continuous operation and/or battery recharging.

Note: To disconnect the device from AC power, first disconnect the power cord from the power outlet, rather than from the device.

6. Capnography Gas Sample Exhaust Port*

Exhaust port for gas samples.

*Optional feature. Only available on Rad-97 equipped with NomoLine Capnography capabilities.

1080p HD Display

- Bright LCD, colour display with ability to manually adjust screen brightness

Auto-Brightness

- Ambient light sensor automatically adjusts screen brightness to optimise visibility in various settings

Profile Indicators

- Profile icon changes and home button illuminates in corresponding colours to provide visual indications of the current Profile setting

Trend Memory

- Max of 96 hours at 2-second resolution
- Display Update Rate/1 second

Automatic Display Rotation

ADULT NEONATAL PEDIATRIC

Rechargeable Battery

- Li-on Battery
- Up to 7 hours battery life[1]
- 3 hours charging time

Communication Options

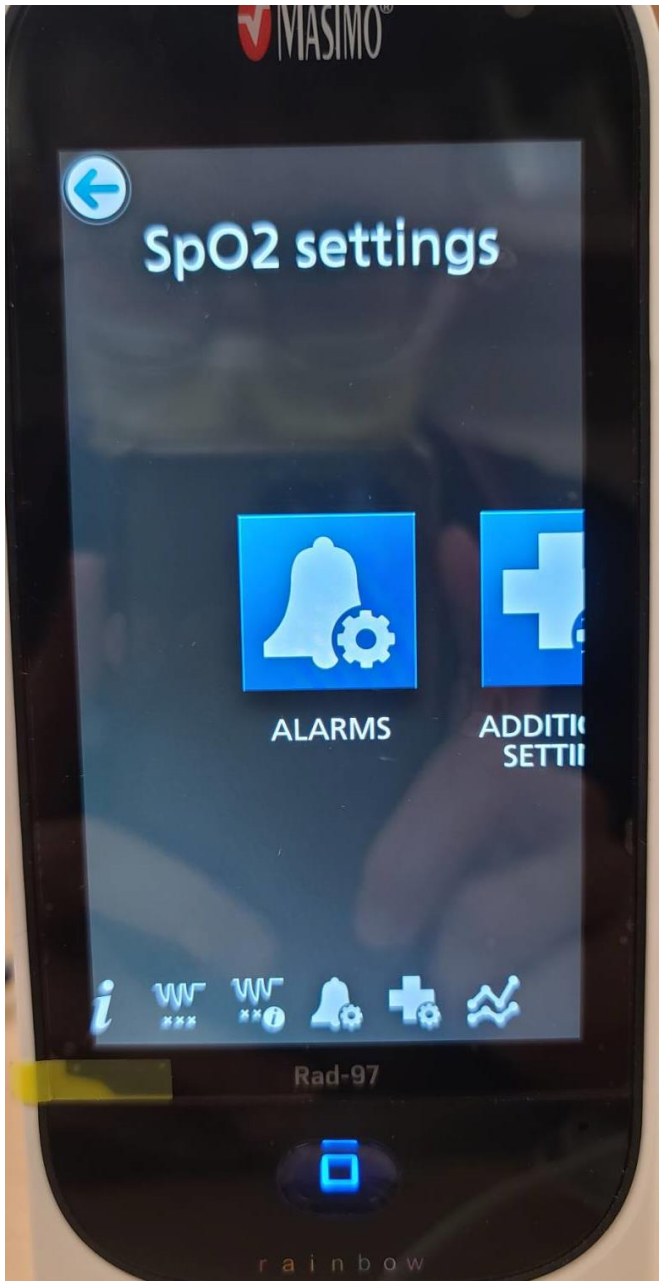
- WiFi (802.11abg)
- Bluetooth® LE
- Nurse Call Interface
- Ethernet
- USB Port

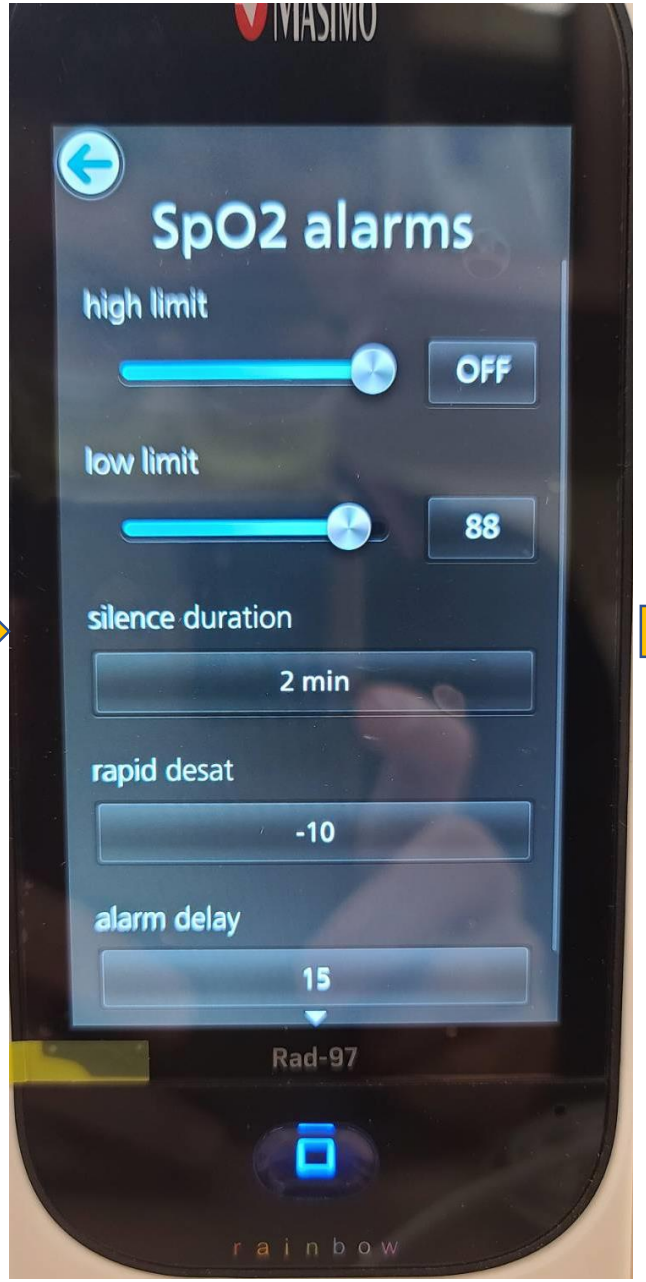
AC Power Connector (110V/220V, 47-63 Hz)

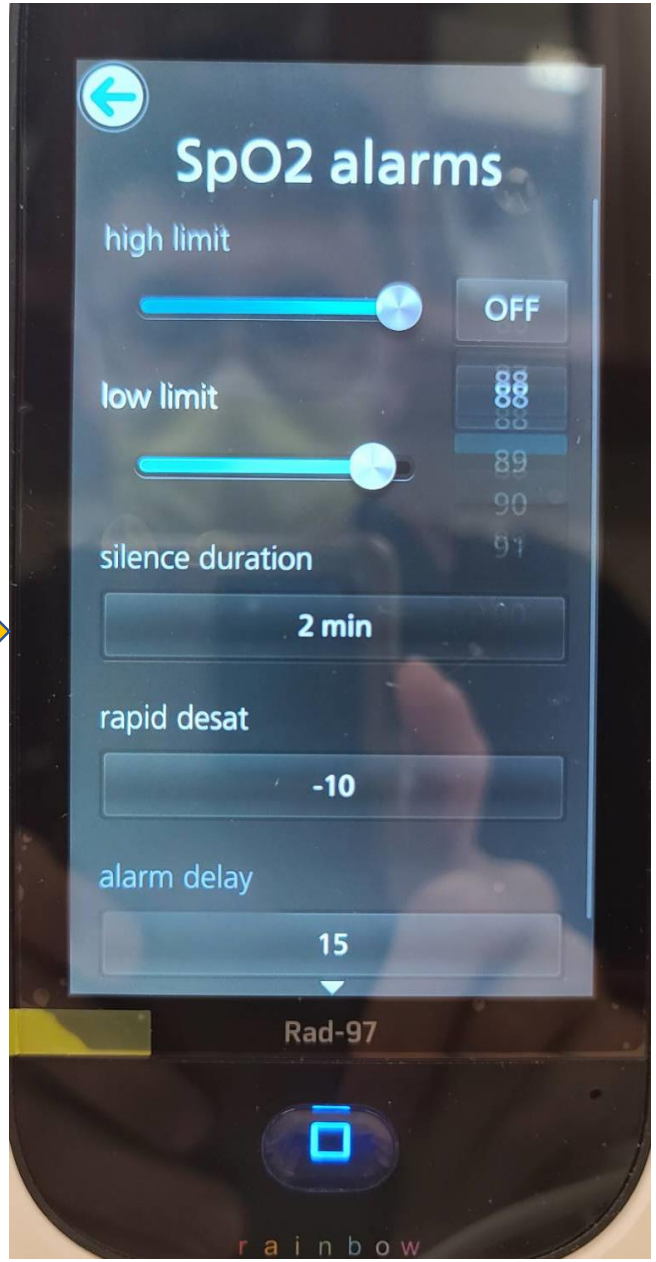
- Built-in to provide a more secure hold between power cable and device

Swivel Foot

- Provides additional support when in vertical orientation

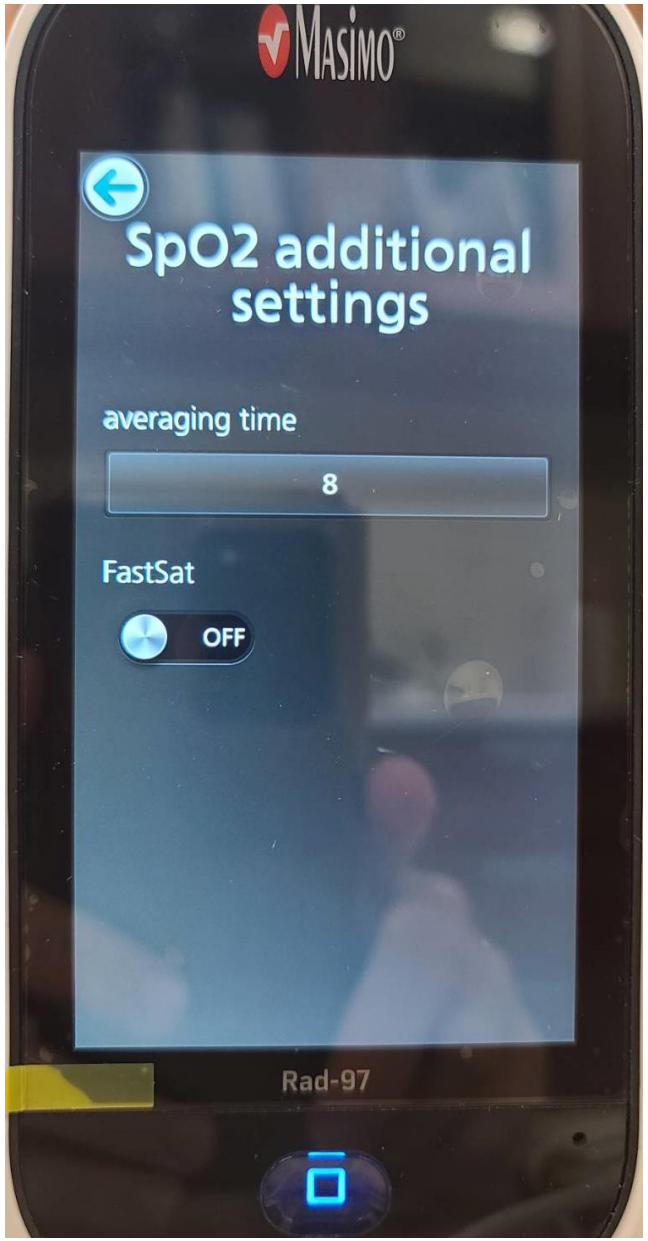

MASIMO
SpO2 settings
ALARMS
ADDITI
SETTI
Rad-97
rainbow


MASIMO
SpO2 alarms
high limit
OFF
low limit
88
silence duration
2 min
rapid desat
-10
alarm delay
15
Rad-97
rainbow


SpO2 alarms
high limit
OFF
low limit
88
89
90
91
silence duration
2 min
rapid desat
-10
alarm delay
15
Rad-97
rainbow

Fast SPO2

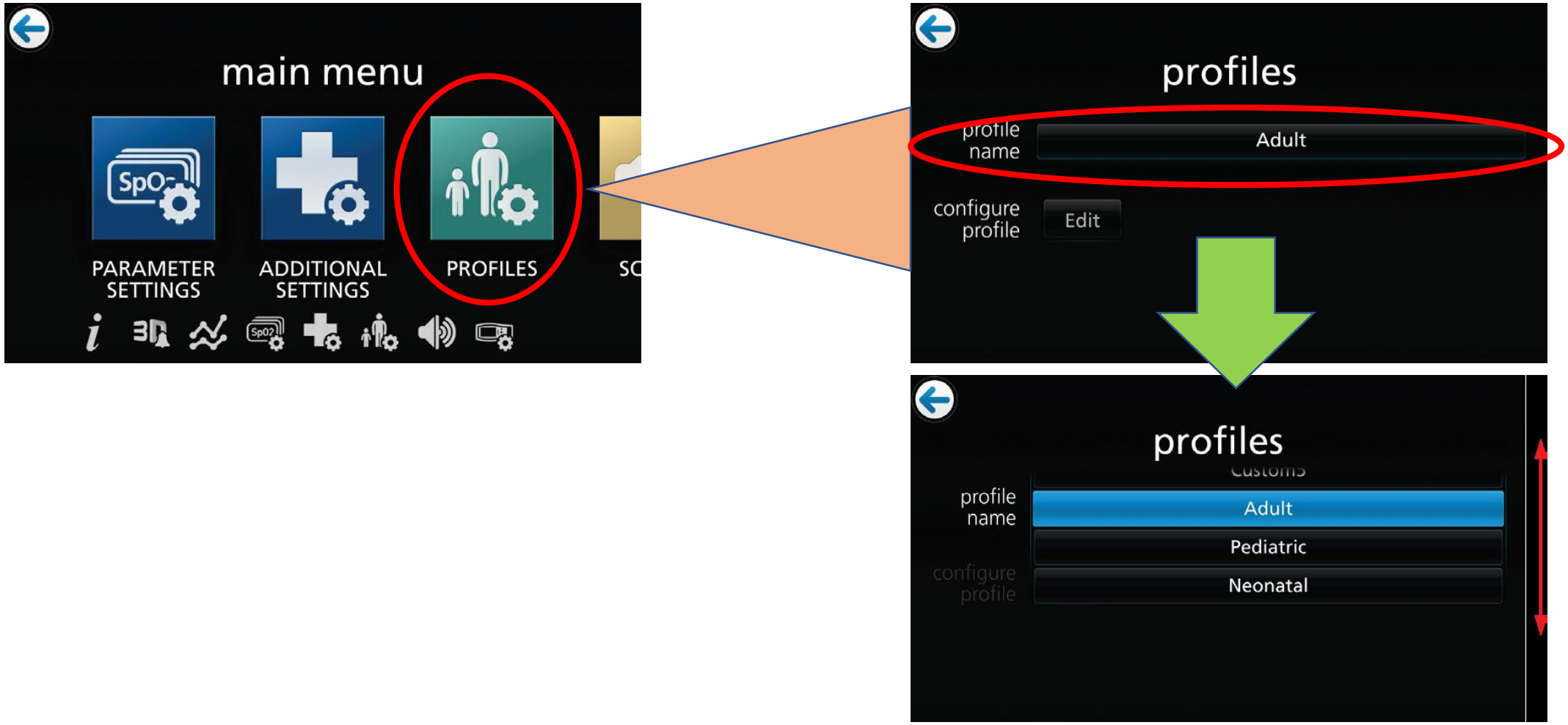
SPO2 其他設定

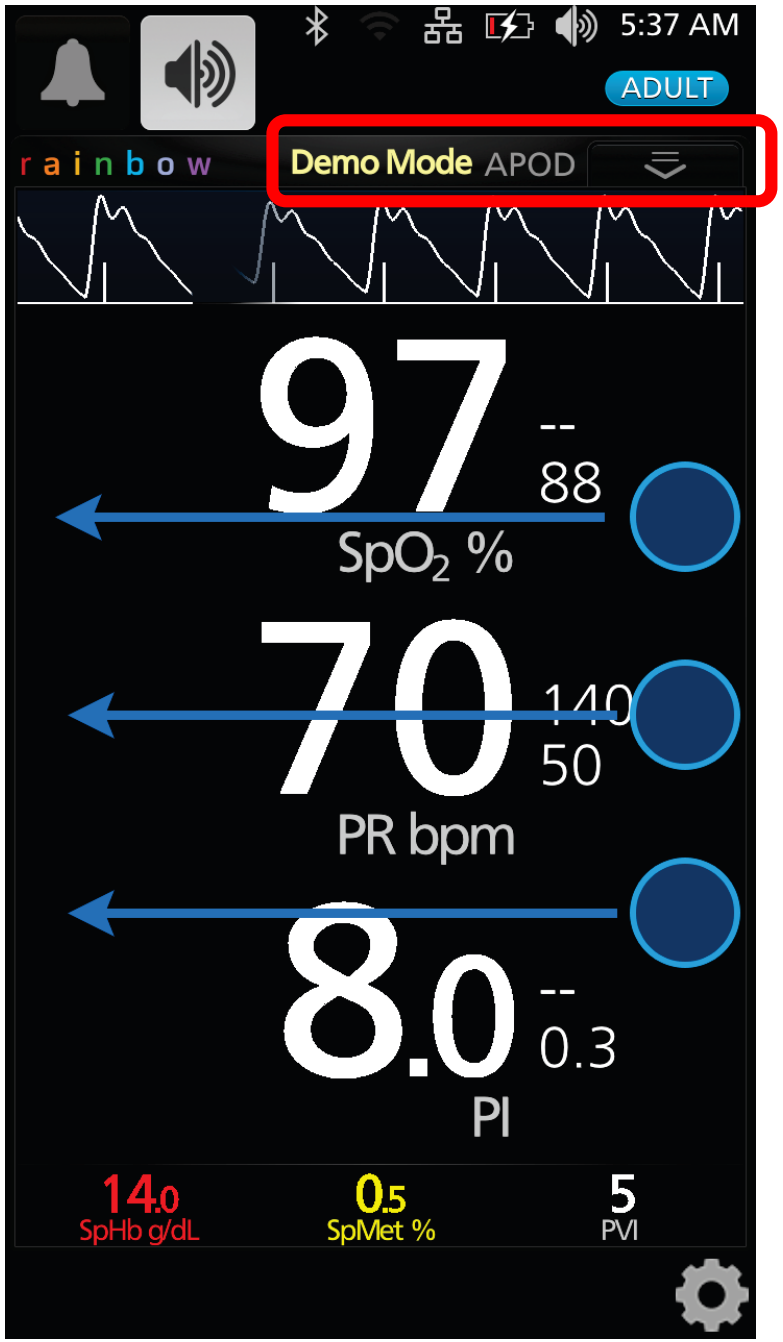


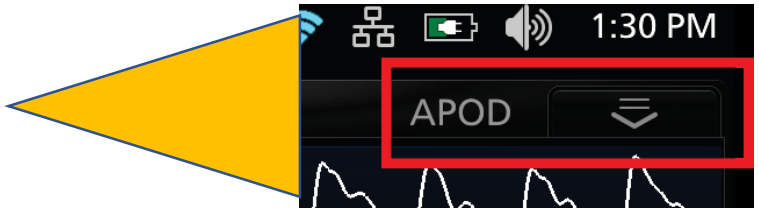
平均時間 : 預設8秒

Fast SPO2 : 2秒 快速量測

使用病患模式切換


main menu
PARAMETER SETTINGS
ADDITIONAL SETTINGS
PROFILES
profiles
profile name
Adult
configure profile
Edit
profiles
profile name
Adult
Pediatric
Neonatal
configure profile





敏感度切換模式

三種敏銳度如下:

- NORM (Normal Sensitivity)

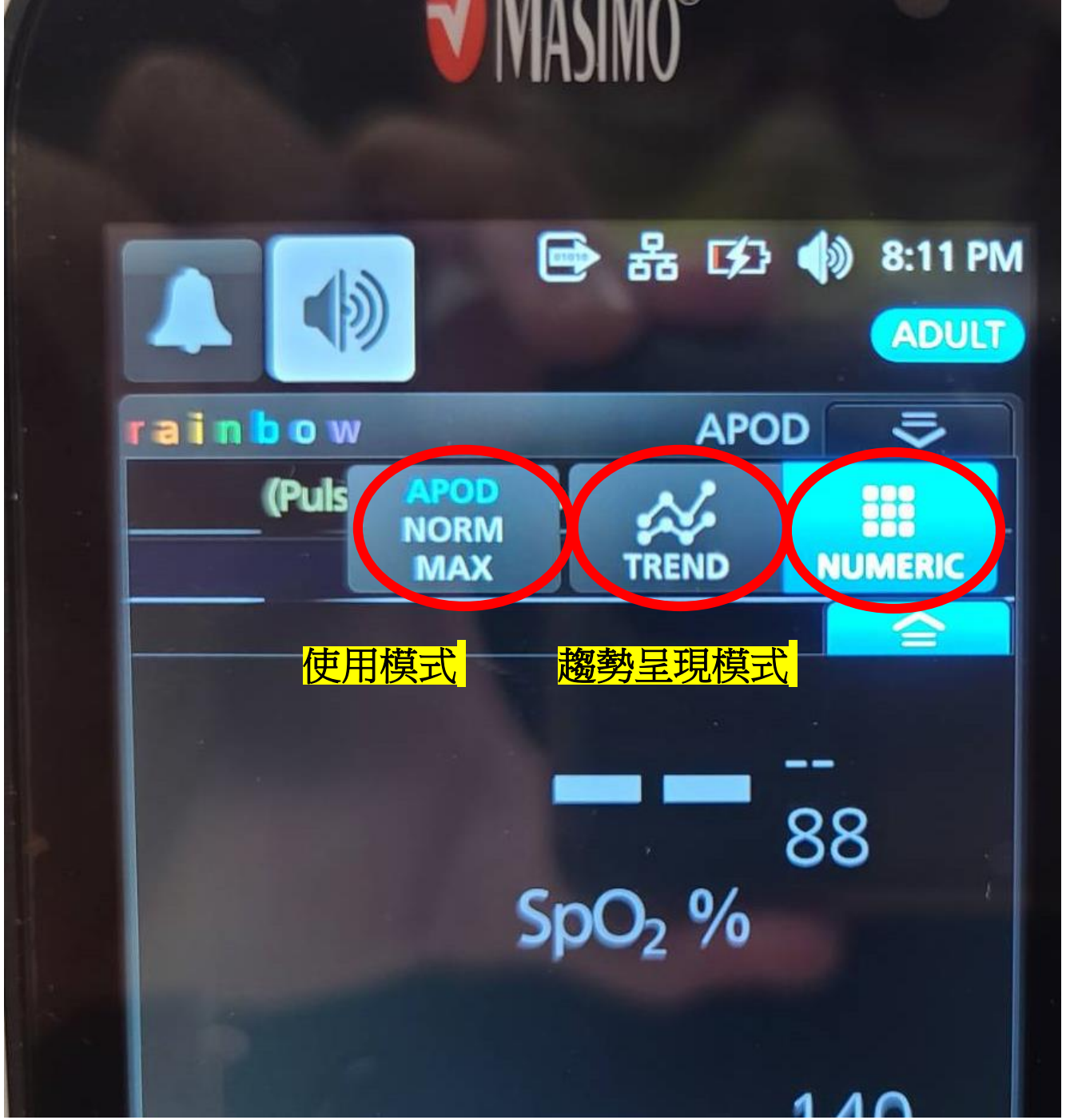
NORM是推薦給有血流或灌注需要調和的患者的敏銳度模式。患者需要經常觀察,如加護病房單位(ICU)。

- APOD®(適應性探頭掉落探測敏銳度)

APOD推薦給感應器高度掉落可能性的敏銳度模式。也適用於不需連續視覺監測的患者區。因為患者過度的移動造成感應器不經意脫落, 此模式對於錯誤的脈搏速率和動脈氧氣飽和濃度讀數提供加強保護。

- MAX(最大敏銳度)

MAX推薦給低灌注或APOD或NORM模式時顯示低灌注訊息的患者。MAX模式不適用於患者不需視覺監測的照護區, 如醫療手術區。專為測量位置因減少灌注而造成訊號微弱的資料顯示。當感應器自患者脫落, 將會調和保護錯誤的脈衝速率和動脈飽和濃度讀數。


MASIMO
8:11 PM
ADULT
rainbow
APOD
(Puls
APOD
NORM
MAX
TREND
NUMERIC
使用模式
趨勢呈現模式
88
SpO2 %

數字呈現模式

Features Rad-97

1.血氧飽和度（SpO2）
2.灌注指數（PI）
3.脈率（PR）
4.灌注變異指數（PVI）

5.總血紅蛋白監測（SpHb）
6.動脈總血氧含量（SpOC）
7.高鐵血紅蛋白（SpMet）
8.碳氧血紅蛋白（SpCO）
9.非侵入式血壓 (NIBP)
10.氧儲備指數 (ORi)*
11. **Respiration acoustique 聲學呼吸 (RRa)**
rainbow Acoustic Monitoring™ (RAM™)
12. **Respiration Rate from the Pleth (RRp)***
13. **Respiration Rate Capnography (RRc)**

Features Rad-97 (NIBP)

SUNTECH

Advantage Technologies

SPECIFICATIONS	VALUES
SMT (Standard Motion Tolerance)	Yes
TMT (Transport Motion Tolerance)	Yes
HDM (Hemodialysis Monitoring)	Yes
RMT (R-wave Motion Tolerance)	N/A
VET (Veterinary Monitoring)	Yes
KSK (Kiosk)	Yes

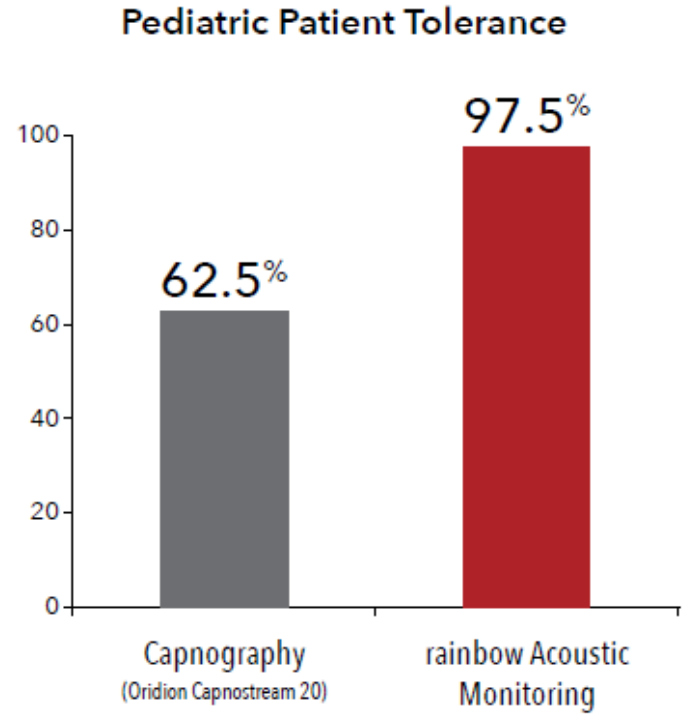
獸醫

隧道血壓機

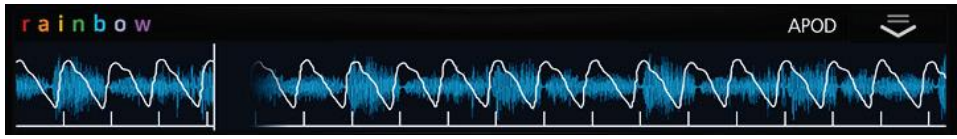
Adult & Pediatric:

Part #	Description	Range	Color	Cuff
25303	Reusable Infant Cuff (5/box) Female Quick Connect, for use with Male Quick Connect NIBP Hose	8-13 cm	Orange	
25260	Reusable Child Cuff, Masimo (5/box) Female Quick Connect, for use with Male Quick Connect NIBP Hose	12-19 cm	Green	
25261	Reusable Small Adult Cuff, Masimo (5/box) Female Quick Connect, for use with Male Quick Connect NIBP Hose	17-25 cm	Turquoise	
25262	Reusable Adult Cuff, Masimo (5/box) Female Quick Connect, for use with Male Quick Connect NIBP Hose	23-33 cm	Navy Blue	
25263	Reusable Large Adult Cuff, Masimo (5/box) Female Quick Connect, for use with Male Quick Connect NIBP Hose	31-40 cm	Burgundy	
25304	Reusable Thigh Cuff (5/box) Female Quick Connect, for use with Male Quick Connect NIBP Hose	38-50 cm	Brown	

Features Rad-97 (RRa)



15 out of 40 pediatric patients removed the nasal cannula while only one removed the rainbow® acoustic sensor.[6]

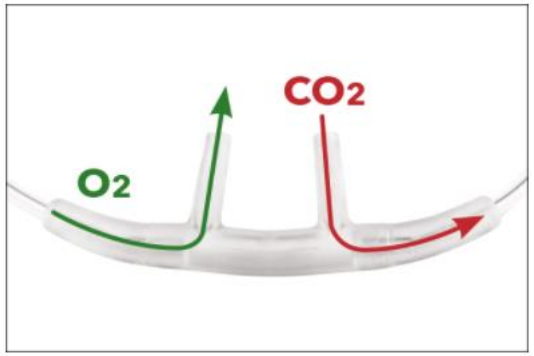


RAS Sensors

RAM Dual Cables

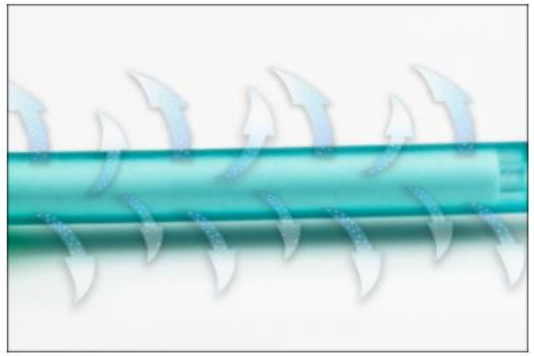
RAS-125c

Features Rad-97 Respiration Rate Capnography(RRc)



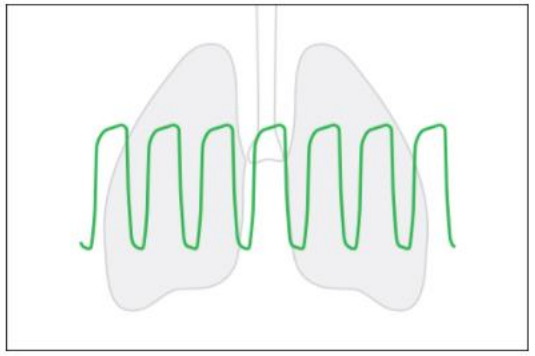
分流插管設計

› 減少氣體混合，促進準確的EtCO 2測量



專利吸濕排汗技術

› 無水樣品提供準確的氣體測量

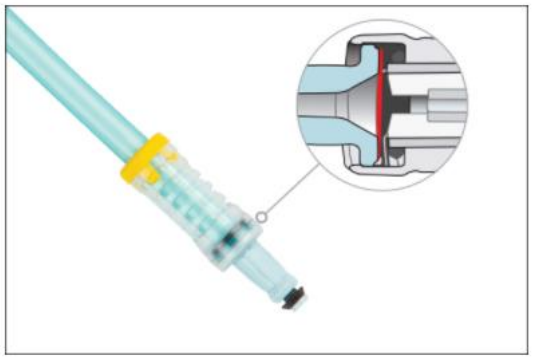


低流量採樣率

› 可以對潮氣量小和呼吸頻率高的患者進行二

人體工學設計的插管

› 貼合面部輪廓，將壓力降至最低，使患者感到舒適



疏水細菌過濾器

› 通過防止水侵入防止氣體分析儀的污染並延長模塊的使用壽命

Star Lumen O 2輸送管

› 即使扭結也可以連續，準確地供應O 2

配件

Features Rad-97 資訊化

Kite

Kite provides a supplemental display of data from a Masimo device

- > Display patient data from Masimo monitors on compatible smart devices
- > Configure the display differently than that of the connected Masimo device
- > Integrates into existing hospital infrastructures where a supplemental display may be beneficial, such as the operating room or cardiac theater

Masimo Patient SafetyNet System

CONFIGURABLE SCREEN ALLOWS YOU TO VIEW THE NUMBER OF PATIENTS, CLINICAL MEASUREMENTS AND LEVEL OF DETAIL THAT ARE IMPORTANT TO YOU

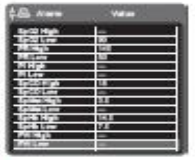
With Masimo RadNet, you choose the system configuration that meets your specific clinical need. You can display real-time data from up to 40 patients at a time, and select up to four Masimo Rainbow SET measurements based on your patient population and clinical practices.

> The configurable Masimo RadNet central assignment station is shown at left in patient detail mode displaying four physiological parameters—SpO2, pulse rate, respiration rate, and total hemoglobin (SpHb).

ADMITTING PATIENTS TO THE SYSTEM IS AS EASY AS 1-2-3

Step 1
IDENTIFY THE PATIENT

Simply enter patient name and room number



Step 2
SET ALARM LIMITS

Confirm pre-set patient alarm limits or modify as needed

Step 3
SELECT CLINICIAN PAGERS

Select specific pagers to which alarms are to be sent

Rad-97 Specifications

ACCURACY (A_{RMS})[2]

Oxygen Saturation (%SpO_2)	70–100%
No Motion Adults/Paediatrics/Infants	2%
No Motion Neonates	3%
Motion Adults/Paediatrics/Infants/Neonates	3%
Low Perfusion Adults/Paediatrics/Infants/Neonates	2%
Oxygen Saturation (%SpO_2)	60–80%
No Motion Adults/Paediatrics/Infants	3%
Pulse Rate (PR)	25–240 bpm
No Motion	3 bpm
Motion	5 bpm
Low Perfusion	3 bpm
Total Haemoglobin (SpHb)	8–17 g/dL
Adults/Paediatrics	1 g/dL
Carboxyhaemoglobin (%SpCO)	1–40%
Adults/Paediatrics/Infants	3%
Methaemoglobin (%SpMet)	1–15%
Adults/Paediatrics/Infants/Neonates	1%
Respiration Rate (RRa)	4–70 bpm
Adults/Paediatrics	1 bpm
Respiration Rate (RRp)	4–70 rpm
Adults/Paediatrics	1 rpm

PHYSICAL CHARACTERISTICS

Weight	< 1.36 kg (3 lbs)
Dimensions	22.9 cm x 16.5 cm x 10.2 cm (Approx. 9" x 6.5" x 4")

ENVIRONMENTAL

Operating Temperature	0–35° C (32–95° F)
Atmospheric Pressure	540–1,060 mBar

COMPLIANCE

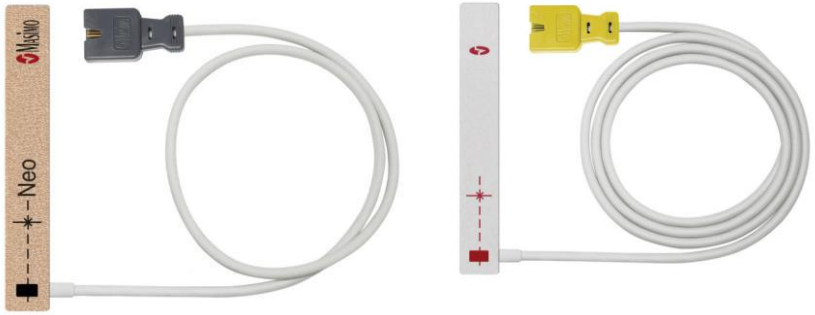
Safety Standard(s)	ANSI/AAMI ES 60601-1, CAN/CSA C22.2 No. 60601-1, IEC/EN 60601-1, 3rd Ed.
Pulse Oximeter Standard(s)	ISO 80601-2-61
Alarm Standard(s)	IEC 60601-1-8
EMC Standard(s)	EN 60601-1-2, Class B
Type of Protection	Class I (AC power) / Class II (Internally Powered)
Degree of Protection	Type BF, Defib Proof-Applied Part
Mode of Operation (per IEC 60601-1)	Continuous Operation
Enclosure Degree of Protection	IP21

4-3 Rad-97 導線應用

特殊耳夾 sensor (重複使用)

成人耳夾 sensor (重複使用)

成人指夾 sensor (重複使用)



新生兒 sensor (單一病患使用)

成人指套 sensor (重複使用)

額貼 sensor (重複使用)