RESMED

Stellar™ 100
Stellar™ 150

INVASIVE AND NONINVASIVE VENTILATOR

Data Management Guide

English

The following table shows where data from the Stellar device can be viewed. Data displayed in ResScan™ can be downloaded via the ResMed USB stick or via a cable connected directly from the Stellar device to the computer.

Note: *Please refer to your Stellar device Clinical Guide for further details.*

Viewing Data

Parameter	Stellar		ResScan 4.3	
	Monitoring Screens	Info screens	ResMed USB Stick	USB Cable[1]
Type of Data	LIVE	STORED	STORED	STORED
Device Log	–	✓	✓	✓
Events	–	✓	✓	–
Leak (L/min)	✓	✓	✓	✓
Minute Ventilation (L)	✓	✓	✓	✓
Tidal Volume (ml)	✓	✓	✓	✓
Respiratory Rate (breaths/min)	✓	✓	✓	✓
I:E Ratio	✓	✓	✓	✓
Pressure (cm H_2O)	✓	–	✓	–
Pressure Support (cm H_2O)[2]	✓	✓	✓	✓
AHI/AI	–	✓	✓	✓
SpO_2 (%)[3]	✓	✓	✓	–
ODI[3]	–	–	✓	–
Pulse Rate (beats/min)[3]	✓	–	✓	–
Hours Used	–	✓	✓	✓
FiO_2	✓	–	✓	–
Flow	✓	–	✓	–
Alveolar Ventilation[2]	✓	–	✓	✓
Synchronisation	✓	–	–	–
Inspiratory Time	✓	✓	✓	✓
Inspiratory Pressure	✓	✓	✓	✓

1. For most values only statistic data is available (one value per day).

2. Only available in Stellar 150.

3. Only available if an oximeter is used with the Stellar device.

ResScan Downloaded Data

Stellar	Via ResMed USB Stick	Via Cable
Device Settings	Yes (except Date, Time and Language)	Yes
Summary Data	365 sessions	365 sessions
Detail Graph	7 sessions of breath by breath data: Leak, Tidal Volume, Respiratory Rate, Minute Ventilation, I:E Ratio, Inspiratory Time, Alveolar Ventilation[1] 7 sessions of high rate data (25 Hz): Pressure, Flow No low rate data (one sample per minute)	30 sessions of low rate data (one sample per minute): Minute Ventilation, Leak No high rate data (25 Hz) No breath by breath data
Oximetry[2]	Yes 7 sessions of Pulse Rate and SpO_2	No
Device log (event summary)	3 types of logged events (200 events per type)	3 types of logged events (200 events per type)

1. Only available on Stellar 150 with version SX483-0222 and above.

2. Only available if an oximeter is used with the Stellar device.

ResScan Review Screen Displays

	Statistics	Summary Graphs	Detailed Graphs	Oximetry Statistics[1]	Device Log
Stellar	✓	✓	✓	✓	✓

1. Only available if an oximeter is used with the Stellar device.

ResScan Review Screen Display Descriptions

	Statistics[1]	Summary Graphs	Detailed Graphs
Alveolar Ventilation	Shows the 95th percentile, 5th percentile and median statistics for the selected sessions in the Data Browser.	Shows the 95th percentile, 5th percentile and median statistics for single sessions.	With Target Ventilation indicated as a red line.
Apnoea Indices	Shows the AHI and AI for the selected sessions in the Data Browser.	Shows a vertical bar graph where the lower segment is the median AI per hour, and the upper segment is the median AHI per hour.	Shows a cumulative total of the number of apnoeas and hypopnoeas that have occurred. The cumulative total is reset every hour, on the hour.
Events	–	–	Apnoeas are shown at the time they end. The duration of the apnoea, in seconds, is displayed above the symbol. Apnoeas are represented by coloured symbols, where the height of the symbol is proportional to the duration of the apnoea. The type of apnoea (obstructive, central, or unknown), is indicated by the symbol and its colour. The duration of the apnoea, in seconds, is displayed above the symbol. Hypopnoeas are recorded and displayed after ten seconds. Hypopnoeas are represented by a blue rectangle.
Flow	–	–	Shown as a blue trace.
Inspiratory Time	Shows the 95th percentile, 5th percentile and median statistics for the selected sessions in the Data Browser.	Shows the 95th percentile, 5th percentile and median statistics for single sessions.	With Ti Min and Ti max indicated as red lines.
Inspiratory Pressure	Shows the 95th percentile, 5th percentile and median statistics for the selected sessions in the Data Browser.	Shows the 95th percentile, 5th percentile and median statistics for single sessions.	–
Leak (L/min)	Shows the 95th percentile, 5th percentile and median statistics for the selected sessions in the Data Browser.	Shows the 95th percentile, 5th percentile and median statistics for single sessions.	Shown as a blue trace. A red line provides a reference level of the recommended maximum acceptable leak.
Mask Event	–	A mask event within the usage summary graph is defined as a usage period of 10 minutes or greater between a pair of individual mask on and mask off events.	–
Minute Ventilation (L/min)	Shows the 95th percentile, 5th percentile and median statistics for the selected sessions in the Data Browser.	Shows the 95th percentile, 5th percentile and median statistics for single sessions.	Shown as a blue trace.
Pressure (cm H_2O)	–	–	Shown as a blue trace.
Pressure Support (cm H_2O)	Shows the 95th percentile, 5th percentile and median statistics for the selected sessions in the Data Browser.	Shows the 95th percentile, 5th percentile and median statistics for single session.	–
Pulse Rate (beats/min)	Shows the maximum, 95th percentile, 5th percentile and median statistics for the selected sessions in the Data Browser.	–	Shown as a blue trace.
SpO_2 (%)	Shows the maximum, 95th percentile, 5th percentile and median statistics for the selected sessions in the Data Browser.	–	Shown as a blue trace. A red line provides the 90% reference level to assist identification of desaturations.

	Statistics[1]	Summary Graphs	Detailed Graphs
Usage	Total hours used, Daily usage, Used Days ≥ X:YY hours, Used Days < X:YY hours, Total days and % Used Days. Calculated for the sessions selected in the Data Browser.	Each period is shown as a solid bar. A hollow bar indicates a period of usage where the end-time is unknown. There is a limit of 10 separate bars shown for a single session. In the event where there are greater than 10 periods, the 10th period will be overwritten by the latest period of the session[2].	–
Total Usage	–	Shows the total hours used per day with compliance threshold indicated by a red line.	–
Tidal Volume	Shows the 95th percentile, 5th percentile and median statistics for the selected sessions in the Data Browser.	Shows the 95th percentile, 5th percentile and median statistics for single sessions.	Shown as a blue trace.
Respiratory Rate	Shows the 95th percentile, 5th percentile and median statistics for the selected sessions in the Data Browser.	Shows the 95th percentile, 5th percentile and median statistics for single sessions.	Shown as a blue trace. A red line provides a reference level to indicate Target patient rate in iVAPS mode[3], Backup breath rate in PAC, ST and Respiratory rate in T mode.
% Spontaneous Cycled Breaths	Show the percentage of spontaneous cycled breaths for the selected sessions in the Data Browser.	Show the spontaneous cycled breaths percentage for single sessions.	–
% Spontaneous Triggered Breaths	Show the percentage of spontaneous triggered breaths for the selected sessions in the Data Browser.	Show the spontaneous triggered breaths percentage for single sessions.	–
I:E Ratio	Shows the 95th percentile, 5th percentile and median statistics for the selected sessions in the Data Browser.	Shows the median percentage for single sessions. Ti (purple) and Te (blue) are expressed as a percentage of the total breath cycle time.	Shows the breath by breath percentage. Ti (purple) and Te (blue) are expressed as a percentage of the total breath cycle time. A red line provides reference to I:E=1:2 (33%).
FiO_2 (if measured)[4]	–	–	Shown as a blue trace.

1. Stellar calculates its statistics day by day with a maximum of 10 usage periods (10 mask events) per session. In the event where there are greater than 10 mask events the 10th mask event will be overwritten by the latest mask event of the usage session.

   Stellar 100 and Stellar 150 does not record statistics, summary data or detailed data for usage period less than 10 minutes, but all individual mask on and mask off events are recorded regardless if they are part of a valid 10 minute usage period. These events are all viewable from the ResScan device log.

   This difference in recording criteria may explain some minor differences in total usage time between the statistics and the manually calculated durations between mask on and mask off events in the device log.

2. A valid usage period is labelled as a mask event within the usage summary graph.

3. Only available on Stellar 150.

4. When FiO_2 sensor is connected:
   - the data displayed should be 21% or above.
   - if the data is lower than 20%, it indicates that the sensor requires recalibration or replacement.

   When FiO_2 sensor is not connected the detailed graphs will be empty.

❀ Updating Settings

Parameter	Mode						ResMed USB stick[2]	USB cable
	CPAP	S	ST	T	iVAPS[1]	PAC		
Clinical Settings								
Therapy Mode	✓	✓	✓	✓	✓	✓	✓	✓
Set Pressure	✓	–	–	–	–	–	✓	✓
Start CPAP	✓	–	–	–	–	–	✓	✓
Maximum Ramp	✓	✓	✓	✓	✓	✓	✓	✓
Ramp Time	✓	✓	✓	✓	✓	✓	✓	✓
Start EPAP	–	✓	✓	✓	✓	✓	✓	✓
EPAP or PEEP	–	✓	✓	✓	✓	✓	✓	✓
IPAP	–	✓	✓	✓	–	✓	✓	✓
PS	–	✓	✓	✓	–	✓	✓	✓

Parameter	Mode						ResMed USB stick[2]	USB cable
	CPAP	S	ST	T	iVAPS[1]	PAC		
Clinical Settings								
Cycle Sensitivity	–	✓	✓	–	✓	–	✓	✓
Trigger Sensitivity	–	✓	✓	–	✓	✓	✓	✓
Rise Time	–	✓	✓	✓	✓	✓	✓	✓
Fall Time	–	✓	✓	✓	✓	✓	✓	✓
Height	–	–	–	–	✓	–	✓	✓
Target Alveolar Volume	–	–	–	–	✓	–	✓	✓
Max PS	–	–	–	–	✓	–	✓	✓
Max Ti/Ttot[3]	–	–	–	–	✓	–	✓	✓
Min PS	–	–	–	–	✓	–	✓	✓
Target Patient Rate	–	–	–	–	✓	–	✓	✓
Ti Max	–	✓	✓	–	✓[4]	–	✓	✓
Ti Min	–	✓	✓	–	✓[4]	–	✓	✓
Ti	–	–	–	✓	–	✓	✓	✓
Backup Respiratory Rate	–	–	✓	✓	–	✓	✓	✓

Parameter	ResMed USB stick	USB cable
Alarm Settings		
High Pressure, Low Pressure, Low Minute Ventilation, High Breath Rate, Low Breath Rate, Apnoea, High Leak, High FiO₂, Low FiO₂, Low SpO₂, Non-Vented Mask, Alarm Volume	✓	✓
Options		
Mask, SmartStart™, Program, Enable Program, Change Program Names	✓	✓
Language, Local Date & Time	–	✓
Reminder[5]		
Mask Reminder, Service Reminder, Air Filter Reminder, Customised Reminder, Call Provider Reminder	✓	✓

1. Only available on Stellar 150.
2. When updating settings using the ResMed USB stick, ensure the correct device is selected by checking the device's software version number. This software version number may be found on the device's Device Information screen. If the software version is between SX483-0212 and SX483-0214 select Stellar 100/150 (SX483-0212 and SX483-0214), otherwise select Stellar 100/150.
3. Only for version SX483-0214 and earlier.
4. Only for version SX483-0222 and above.
5. Reminder settings: enable reminder, set date, set interval. The reminder can be set using ResScan. However, the reminders will only be displayed on the Stellar device after the motor has reached 2hrs of operation.

〽 ResScan Detailed Graphs Specifications

Parameter	Resolution	Range	Sampling period	
			Via ResMed USB Stick	Via Cable
Events (sec)	1	0-120	aperiodic	aperiodic
AHI (events/hr)	1	0–120	cumulative, reset per hour	n/a
Flow (L/min)	1	-110 to 260	25 Hz[1]	n/a
Inspiratory Time (sec)	0.1	0.00-12.00	every breath	n/a
Leak (L/min)	1	0–120	every breath	1 minute average[2]
Minute Ventilation (L/min)	0.1	0–60	every breath	1 minute average[2]
Pressure (cm H₂O)	0.1	0-50	25 Hz[1]	n/a
Pulse Rate (beats/min)[3]	1	18–300	1 Hz[1]	n/a
SpO₂ (%)[3]	1	40–100	1 Hz[1]	n/a
Tidal Volume (ml)	10	0-3000	every breath	n/a
Respiratory Rate (breaths/min)	1	5-60	every breath	n/a

Parameter	Resolution	Range	Sampling period	
			Via ResMed USB Stick	Via Cable
I:E Ratio	0.05	0.25-4.0	every breath	n/a
Aveolar Ventilation[4]	0.1	0.0-60.0	every breath	n/a
FiO_2 (%)[5]	1	0-100	every breath	n/a

1. High resolution
2. Low resolution
3. Only available if an oximeter is used with the Stellar device.
4. Only available on Stellar 150 with version SX483-222 and above.
5. Only available if an FiO_2 sensor is used with the Stellar device.

ResScan Device Log

Parameter	Resolution	Range	Sampling period	
			Via ResMed USB Stick	Via Cable
Device Log	n/a	3 types of logged events (200 events per type)	aperiodic	aperiodic

Glossary

Note: Please refer to the relevant Stellar device Clinical Guide for further details.

Apnoea

An apnoea is the temporary absence or cessation of breathing. An apnoea is scored when there is reduction in breathing by 75% of the baseline breathing for at least 10 seconds.

Apnoea Indices

For all indices, the value shown in statistics is the total number of events divided by Daily Usage.

- **AHI — Apnoea–Hypopnoea Index**
  The total number of events is calculated by adding the number of apnoea and hypopnoea events.

  For graphs, the AHI count is incremented at the occurrence of every event and reset every hour.

- **AI – Apnoea Index**

Daily Usage

Daily Usage is total usage in a single session (a session starts at midday and finishes 24 hours later).

- **Average Daily Usage**
  Average daily usage is the result of the sum of Daily Usage divided by Used Days, over a selected time period.

- **Median Daily Usage**
  Median Daily Usage is the middle value for daily usage, where values for Daily Usage are listed from low to high, over a selected time period. While a few exceptionally high or low values can have a significant influence on an average measure, the median is typically more reflective of the true central tendency.

Days not Used

Days not used is the number of calendar days within multiple sessions, when therapy was zero.

Device Log

ResScan Device Log displays the summary of 3 types of events: changes in settings, alarms and system events (eg, data erased, connection of ResMed USB stick). There are up to 200 events of each type, displayed in chronological order, with the most recent event displayed at the top by default.

These events are displayed on the Event Summary screen on Stellar.

EPAP (Expiratory Positive Airway Pressure)

EPAP is the pressure delivered to the patient during the patient's expiratory phase.

Events

An event is the occurence of a residual apnoea or hypopnoea.

Events are recorded as they occur. The maximum number of events stored per session is 500.

FiO_2

FiO_2 is the average of fraction of oxygen level measured at the Stellar air outlet. The value is available when FiO_2 sensor is connected in the range of 18-100% (eg, FiO_2 in the room air is 21%).

Flow

Flow is an estimate of the airflow entering the lungs.

It is derived by taking the total flow and then removing the leak and mask vent flow components.

Hypopnoea

An hypopnoea is an episode of shallow breathing during sleep. An hypopnoea is scored when flow decreases to 50% but greater than 25% of baseline for more than 10 seconds.

I:E Ratio

The ratio of inspiratory time to expiratory time.

IPAP (Inspiratory Positive Airway Pressure)

IPAP is the pressure delivered to the patient during the patient's inspiratory phase.

iVAPS
(Only available on Stellar 150)

iVAPS is designed to maintain a preset target alveolar ventilation by monitoring delivered ventilation, adjusting the pressure support and providing an intelligent backup breath automatically.

Leak

Leak is an estimate of the total rate of air escaping due to mouth and mask leaks.

It is derived by analysing the inspiratory and expiratory airflows, together with the expected mask vent flows.

High or changing leak rates may affect the accuracy of other measurements as well as the triggering/cycling performance.

Minute Ventilation

Minute ventilation is the volume of air breathed in (or out) within any 60-second period.

Pressure

The displayed pressure depends on the mode.

CPAP mode: provides a fixed-positive pressure air flow. Set CPAP pressure is displayed.

S, ST, T and PAC mode: provides an inspiration pressure (IPAP) and expiration pressure (EPAP/PEEP). Set IPAP and EPAP/PEEP are displayed on Treatment screens.

Pulse Rate

The number of heart beats in a 60-second time frame. The pulse rate is calculated by an attached oximeter.

Respiratory Rate

Respiratory rate is the frequency of breathing, expressed as the number of breaths per minute.

- **% Spontaneous Cycle**

  Percentage of breaths that are spontaneously cycled throughout the day. The device cycles (terminates IPAP and changes to EPAP) when it senses that the patient is breathing out.

- **% Spontaneous Trigger**

  Percentage of breaths that are spontaneously triggered throughout the day. The device triggers (initiates IPAP) when it senses that the patient is breathing in.

Statistics

- **95th Percentile**

  This value generally reflects a more accurate interpretation of the true high value by eliminating any exceptionally high values that could skew the data. The 95th percentile is the value below which 95% of observations fall where values are listed from low to high, over a selected time period.

- **5th Percentile**

  This value generally reflects a more accurate interpretation of the true low value. The 5th percentile is the value below which 5% of observations fall where values are listed from low to high, over a selected time period. The 5th percentile is typically more reflective of the true low value.

SpO$_2$

SpO$_2$ is a measure of the saturation of blood hemoglobin with oxygen, expressed as a percentage. The oxygen saturation is calculated by an attached oximeter.

Target alveolar ventilation and Alveolar ventilation (Va)
(Only available on Stellar 150)

Target alveolar ventilation is the main parameter that iVAPS uses to determine the amount of pressure support required. Alveolar ventilation represents the useful portion of ventilation that reaches the alveoli and does not include the anatomic deadspace.

Te

Te is the duration of expiration (ie, the respiratory flow out of the lungs).

Ti

Ti is the duration of inspiration (ie, the respiratory flow into the lungs).

On the Results screen, it is calculated by averaging the inspiration time for the last five breaths.

As a setting in PAC and T modes, it sets the duration of inspiration in timed breath.

Ti Min and Ti Max

In S and ST modes, this sets the minimum/maximum time for the pressure to remain at IPAP (inspiration) level.

Tidal Volume

Tidal volume is the volume of air inspired or expired in one respiratory cycle (breath).

Total Days

Total days is the number of calendar days within multiple sessions.

Trigger and Cycle

Trigger sensitivity describes how much patient inspiratory effort (flow) is required for the device to change from EPAP to IPAP.

Cycle sensitivity describes how much inspiratory flow needs to fall for the device to change from IPAP to EPAP.

Usage (Hours used)

Usage is the length of time that a patient receives therapy from the device.

Used Days

Used days is the total number of days during which a patient receives therapy from the device.

% Used Days

% used days calculates the percentage of used days out of the total number of days selected.

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