pulse oximetry

SMARTsat®

High performance SpO$_2$ technology for OEMs
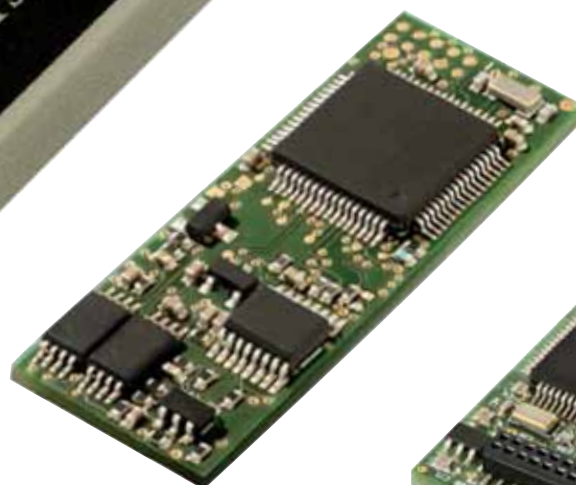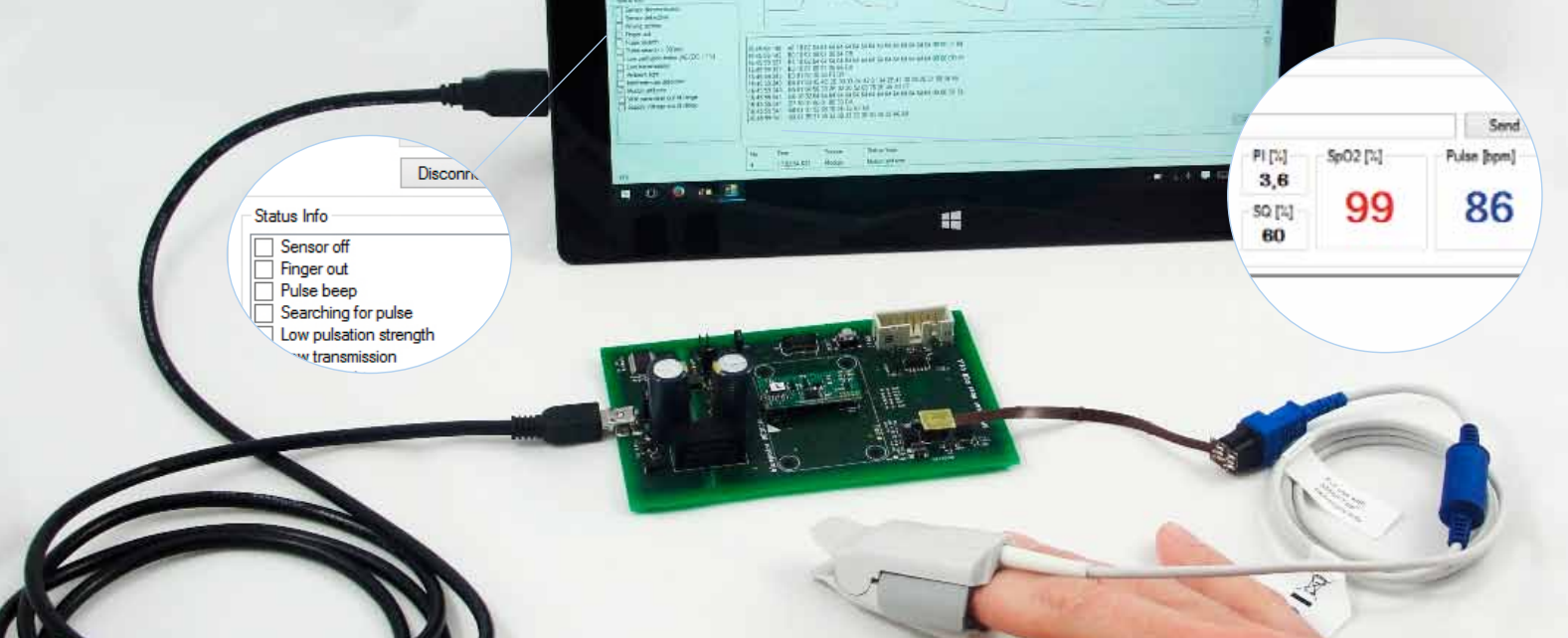
OEM I

SMARTsat® EB

EB

OEM II

OEM III

VIAMED

SMARTsat technology – Now you have a choice!
High performance SpO$_2$ technology for OEMs

The SMARTsat technology platform was developed over the last few years, in close cooperation with well-established research institutions and university hospitals.

The very latest and innovative signal processing technologies and algorithms enable precise measurements, even under very difficult physiological conditions. SMARTsat technology has extremely low power consumption requirements, and is a real alternative for OEM customers whom require high-end pulse oximetry solutions for their applications.

In accordance with ISO Standards, the approved pulse oximetry sensors are calibrated and evaluated against dyshaemoglobin-free reference measurements, which were determined from CO oximeter data and do not contain saturation components of the haemoglobin fractions SaCO and SaMet.

SMARTsat® OEM I & II SpO$_2$ accuracy validation results

A_{RMS} in the SaO$_2$ ranges [2]

Sensor Type	60 - 100%	70 - 100%	90 - 100%	80 - 90%	70 - 80%	60 - 70%
SF7500VM Finger Clip Sensor	1.6	1.5	1.4	1.3	1.7	2.3
SC7500VM [1] Silicone Soft Sensor	1.6	1.6	1.1	1.7	1.8	1.9
W7500VM Wrap Sensor	1.6	1.4	1.0	1.2	1.8	2.8
EP7500VM Ear Clip Sensor	2.2	2.1	1.0	1.7	2.8	3.5
10-AP-VM Disposable Sensor - Adult	2.1	2.1	2.2	1.9	2.0	2.2

SMARTsat® OEM III SpO$_2$ accuracy validation results

A_{RMS} in the SaO$_2$ ranges [2]

Sensor Type	60 - 100%	70 - 100%	90 - 100%	80 - 90%	70 - 80%	60 - 70%
SF7500VM Finger Clip Sensor	1.6	1.5	1.4	1.4	1.7	2.0
SC7500VM [1] Silicone Soft Sensor	1.7	1.6	1.5	1.8	1.7	2.4
W7500VM Wrap Sensor	1.7	1.6	1.3	1.5	1.9	2.4
EP7500VM Ear Clip Sensor	2.4	2.3	1.4	1.6	3.2	3.3
10-AP-VM Disposable Sensor - Adult	2.5	2.4	2.1	2.3	2.6	3.4

1) Accuracy statement applies to SC7500VM, SCM7500VM and SCP7500VM

2) As inherent to their functional principle, pulse oximetry measurements underlie statistical spread; therefore only two thirds of the measurement data are within the specific range of +/- ARMS

Typical applications

SMARTsat is designed for integration into:

- High-End SpO$_2$ monitoring devices
- Patient monitors
- Transport monitors
- Sleep screening devices
- Defibrillators
- Home care monitors
- ... and more

Robust, flexible and hygenic

Viamed provides a range of high quality and comfortable sensors that incorporate the very latest technology

Soft Silicone Sensors

Due to their robust design, the Soft Silicone Sensors are ideal for use in the tough environment of rescue services, emergency services and hospitals.

The Silicone Sensors from the 4000 series are manufacturered from premium materials and their design allows for effective high-level disinfection. This reduces the risk of nosocomial infection associated with surface-borne pathogenic microorganisms.

Available in Adult (SC7500VM), Small Adult (Medium) (SCM7500VM) and Paediatric (SCP7500VM) sizes.

Finger Clip Sensor

Finger Clip sensors are the ideal solution for ambulatory use, or for long-term monitoring. Advanced manufacturing technologies, materials and design elements are found in these sensors. (SF7500VM)

Silicone Wrap Sensor

Silicone Wrap sensors are for universal applications, for use on infants to adults. Wrap tapes are provided with mounting loops, enabling a simple fixation of the skin friendly wrap sensor. (W7500VM)


Ear Sensor

High-quality ear sensor, which is comfortable and easy to use. The ear sensor has an additional sensor holder that prevents sensor movement and prevents it from being dislodged. (EP7500VM)

Disposable Sensors

Disposable sensors with Plaster Tape – the soft material is highly flexible and adaptable. Available in adult (10-AP-VM), paediatric (10-PP-VM), infant (IP-10-VM) and neonatal (10-NP-VM) sizes.
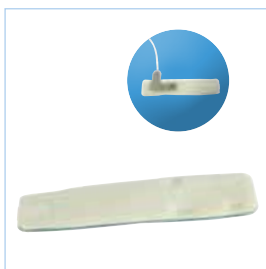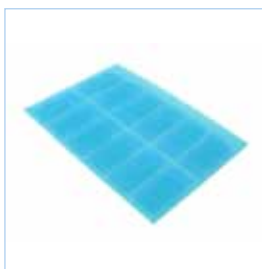

Sensor Wraps
Pack of 12

Multi-site Y Sensor
Single Patient Use

Hydrogel Strips
For use with Y sensor

Hydrogel Pads
For use with Y sensor

Extension Cables
Two standard lengths:
1.2m (XT6500) and
2.4m (XT6501)

Specification		OEM I[4]	OEM II[4]	OEM III[4]	EB[4]
Measurement Range	SpO_2	0 - 100 %	0 - 100 %	0 - 100 %	0 - 100 %
	Pulse Rate	20 - 300 bpm	20 - 300 bpm	20 - 300 bpm	20 - 300 bpm
	Perfusion	0.02 - 20 % (no motion)	0.02 - 20 % (no motion)	0.1 - 20 % (no motion)	0.1 - 20 % (no motion)
Accuracy	SpO_2	60 - 100 % +/- 2 A_{RMS} (no motion)[1] 60 - 100 % +/- 3 A_{RMS} (motion condition)[2] 60 - 100 % +/- 2 A_{RMS} (low perfusion)[3]			
	Pulse Rate	20 - 300 BPM +/- 2 A_{RMS} (no motion)			

Power requirements

	OEM I[4]	OEM II[4]	OEM III[4]	EB[4]
Input voltage (ripple < 10mV)	4.5 – 5.5 VDC	3.2 – 3.6 VDC	3.1 – 3.6 VDC	4.5 – 5.25 VDC
Average power consumption	110 mW @ 5V[5]	70 mW @ 3.3V[5]	24 mW @ 3.3V[5]	106 mW @ 5V[5, 6] 47 mW @ 5V[5, 7]
Maximum power consumption	131 mW @ 5V[5]	83 mW @ 3.3V[5]	29 mW @ 3.3V[5]	125 mW @ 5V[5, 6] 55 mW @ 5V[5, 7]

Environmental conditions

Operation	-25 to +60 °C
Storage	-40 to +70 °C
Relative humidity	15 % - 95 % (operation, non-condensing) 10 % - 95 % (storage, non-condensing)

Serial communication

Baud rate	9600 baud up to 230400 baud

Sampling rate adjustable

Sampling rate adjustable	75 Hz, 150 Hz 75 Hz, 150 Hz, 300 Hz

Applied Standards

SMARTsat module OEM I, II, III	IEC 60601-1:2005 (3rd Ed); IEC 60601-1 (2nd Ed) IEC 60601-1-2:2014 (4th Ed); IEC 60601-1-2 (3rd Ed) EN ISO 80601-2-61:2011; EN ISO 9919:2009 ISO 14971:2007; IEC 60601-1-6:2010; IEC 60601-1-11:2010; IEC 62471:2006
SMARTsat sensors	ISO 10993-1:2009; ISO 10993-5:2009; ISO 10993-10:2010

Dimensions (L x W x H)	**OEM I** 63.5 x 50.8 x 6.3 mm	**OEM II** 37.0 x 14.0 x 5.0 mm	**OEM III** 31.0 x 14.0 x 5.0 mm	**EB** 61.0 x 26.0 x 16.0 mm

Part Numbers

OEM Module	0012700	0012710	0012720	0012730
SMARTsat development kit OEM module, Development platform (includes: sensor flex cable, USB cable & PC software), SoftFlap Finger Cilp SpO2 sensor SF7500VM	0012760	0012761	0012762	
SMARTsat sensor plug		0012745		
SMARTsat sensor plug - PCB mounting version		0012746		
SMARTsat sensor basic flex cable		0012749		
SMARTsat® sensor low noise flex cable		0012750		

[1] A_{rms}: ± 1 Arms represents approx 68% of measurements

[2] Tested with all motion patterns Index II
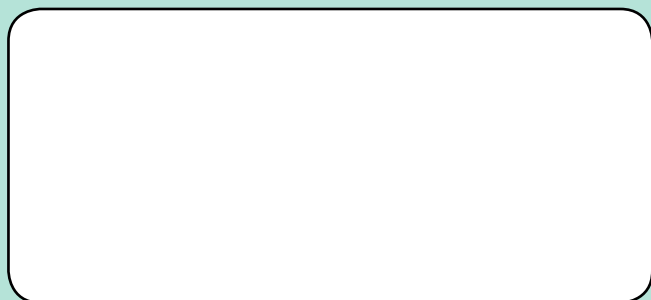
[3] Tested with Prosim 8 simulator

[4] The baud rate has significant influence on the total power consumption of the SMARTsat® OEM I, OEM II and OEM III modules.

[5] 75 Hz, 230400 Bd,

[6] EB with OEM II,

[7] EB with OEM III

Reduced data transfer rates and/or higher sampling rates (150 Hz, 300 Hz) increases power consumption.

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