

ProSim 4

Vital Signs Simulator

Technical Data



ProSim 4 Vital Signs Simulator with breakthrough touchscreen technology offers quick and simple one-tap testing for patient monitor performance checks and troubleshooting. Designed to get you in and out of most locations in 60 seconds, this quick-check device offers 12-lead ECG simulation, respiration, IBP and NIBP testing in the palm of your hand. Featuring specialized stay-connected ECG posts to ensure secure lead connections and no-hassle testing, ProSim 4 is the perfect patient simulator for first-call patient monitor quality assurance and safety professionals.

Elso Philips Service
Jilemnického 2; 911 01 Trenčín
tel: +421 32 6582410, 7431690
fax: +421 32 6582592
email: elso@elso.sk
web: www.elseo.sk

Key features

- Portable multifunction tester offers 12-lead ECG, respiration, IBP and NIBP simulation
- 90 % smaller and lighter than combined technology of legacy products
- Breakthrough touchscreen technology
- One-tap testing for most performance tests and checks
- Easy quick-check patient monitor testing in one minute or less with onboard, customizable patient pre-sets and autosequences
- Integrated, easily-replaceable battery capable of running quick checks all day
- Stay-connected ECG posts for secure lead connections
- Repeatable NIBP testing within 2 mmHg independent of device under test
- Multi-language user interface offers choice of language selection
- Tilt stand design for operation in tight spaces and better viewing angle

Specifications

General specifications

Temperature	Operating	10 °C to 40 °C (50 °F to 104 °F)
	Storage	-20 °C to +60 °C (-4 °F to +140 °F)
Humidity	10 % to 90 % non-condensing	
Altitude	3,000 meters (9,843 ft)	
Dimensions (L x W x H)	18 cm x 9.3 cm x 5.5 cm (7.1 in x 3.7 in x 2.2 in)	
Display	LCD touch-screen color display	
Communication	USB port (for calibration and firmware updates only)	
Power	Lithium-ion rechargeable battery	
Battery charger	TBD	
Battery life	Four hours (minimum), 40 NIBP cycles typical	
Weight	0.88 kg (1.93 lb)	
Safety standards	IEC 61010-1:2001	
Certifications	CE, CSA, C-TICK N10140, RoHs	
Electromagnetic compatibility (EMC)	IEC 61326-1:2006	

Detailed specifications

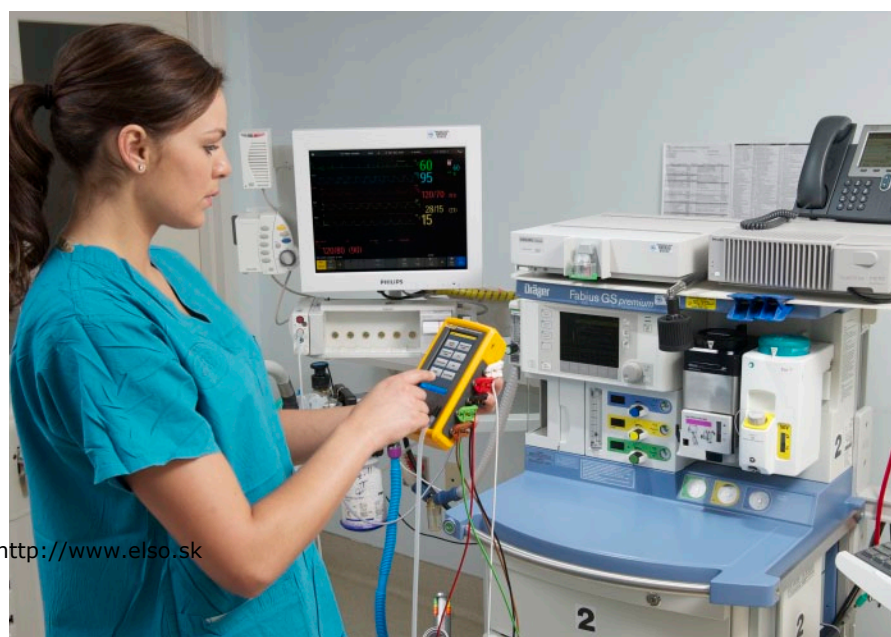
Normal-sinus-rhythm waveform

ECG reference	The ECG amplitudes specified are for Lead II (calibration), from the baseline to the peak of the R wave. All other leads are proportional
Normal sinus rhythm	12-lead configuration with independent outputs referenced to right leg (RL). Output to 10 universal ECG Jacks, color-coded to AHA and IEC standards
Amplitude	1 mV
Amplitude accuracy	± 5 % of setting Lead II
ECG rate	30 BPM, 60 BPM, 80 BPM, 90 BPM, 120 BPM, 150 BPM, 180 BPM, 210 BPM, 240 BPM, 270 BPM, 300 BPM, and 320 BPM
Rate accuracy	± 1 % of setting
ECG waveform selection	Adult (80 ms) or neonatal (40 ms) QRS duration
Power-on default	60 BPM, 1.0 mV, adult QRS

Arrhythmia

Atrial fibrillation	Coarse or fine
Premature ventricular contraction	Left ventricular
Ventricular tachycardia	160 BPM or 200 BPM
Ventricular fibrillation	Coarse or fine
Transvenous pacer pulse	75 BPM, left arterial, 3 mV amplitude on lead II, accuracy ± 10 %, 1.0 ms width
2nd degree AV block	Type 1
3rd degree AV block	3rd degree AV block
Asystole	Asystole

ECG performance testing		
Amplitude	1 mV	
Square wave	60 ms at 2 Hz	
Respiration		
Rate	0 (OFF), 10 BrPM to 100 BrPM in 10 BrPM steps	
Impedance variations ($\Delta \Omega$)	1 Ω	
Accuracy delta	\pm (10 % + 0.05 ohm)	
Baseline	500 Ω to circuit common, giving 1000 Ω between any two leads	
Accuracy baseline	\pm 5 %	
Respiration lead	LA or LL (default)	
Invasive blood pressure		
Channels	1 electrically isolated from all other signals	
BP output	Circular DIN 5-pin	
Input/output impedance	300 $\Omega \pm$ 10 %	
Exciter input range	2 to 16 V peak	
Exciter-input frequency range	DC to 5000 Hz	
Transducer sensitivity	5 μ V/V/mmHg	
Pressure accuracy	\pm (1 % of setting + 1 mmHg) Accuracy guaranteed for dc excitation only	
Static pressure	0 mmHg, 80 mmHg, 160 mmHg, and 250 mmHg	
Dynamic waveforms	Synchronization	To ECG heartrate
	Chambers simulated and systolic/diastolic pressure:	
Type	IBP (arterial)	IBP (left ventrical)
Adult	60/30	60/0
Adult	120/80	120/0
Adult	150/100	150/0
Adult	200/150	200/0
Neonatal	35/15	35/0
Neonatal	70/40	70/0



<http://www.else.sk>

Non-invasive blood pressure		
Pressure units	mmHg	
Manometer (pressure meter)	Range	10 mmHg to 400 mmHg
	Resolution	0.1 mmHg (for display purposes)
	Accuracy	± (1 % reading + 1 mmHg)
Pressure source	Inflation bulb or device under test	
NIBP simulations	Pulse	2 mmHg max into 500 ml NIBP system
	Volume of air moved	1 ml max
	Simulations	Adult: 60/30 (40), 120/80 (93); 150/100 (117); and 200/150 (167)
		Neonatal: 35/15 (22) and 70/40 (50)
	Repeatability	Within ± 2 mmHg (at maximal pulse size independent of device under test)
	Synchronization	To ECG heartrate (maximal rate 120 BPM)
Leak test	Target pressure	20 mmHg to 400 mmHg
	Elapse time	0:30 minutes to 5:00 minutes: seconds in 30 second steps
	Leakage rate	1 mmHg/minute to 200 mmHg/minute
Pressure relief test range	100 mmHg to 400 mmHg	
Presets and autosequences		
Presets	Normal	
	Hypertensive	
	Hypotensive	
Autosequences	Cardiac failure sequence	
	Exercise sequence	
	Respiration sequence	
	Monitor testing sequence	



Ordering information

Models/descriptions

ProSim 4 Prosim 4 Vital Signs Simulator

Standard accessories

3931478 ProSim 4 Getting Started Manual

3931519 ProSim 4 Users Manual CD

2461946 Manual Inflation Bulb

2391882 Set of NIBP Cuff Adapters

3986253 ProSim 4 Battery Pack

4026773 ProSim 4 Power Supply

Line Cord ProSim 4 Line Cord (country-specific)

4026799 ProSim 4 Carrying Case



Optional accessories

3984878 ProSim 4 Accessory Kit, includes:

Unterminated IBP cable, HP-3 IBP cable, MQ-3 IBP cable, TK-1 IBP cable, Adult cuff Mandrel spacer block (3), Adult cuff Mandrel end block (2), Neonatal Mandrel, USB cable, Spare Battery pack, ECG Snap/banana adapter

2392328 Neonatal Cuff Mandrel

2392370 Adult Cuff Mandrel End Blocks (2 needed)

2392381 Adult Cuff Mandrel Spacer Blocks (3 needed)

4026551 ECG Snap Adapter 4 mm and 3.2 mm ECG Banana Adapter Converter Modules (international only)

Line cords

284174 ProSim 4 line cord US

769422 ProSim 4 line cord Schuko

769455 ProSim 4 line cord UK

284174 ProSim 4 line cord Japan

658641 ProSim 4 line cord Australia

284174 ProSim 4 line cord Brazil

Blood pressure cables

2198879 BCI International TK-1 (6M)

2198879 Criticare Systems Inc. (1100) TK-1 (6M)

2198879 Critikon (Dinamap Plus) TK-1 (6M)

2198887 Datascope DS-1 (6F)

2200955 Datex (AS/3, CS/3, Compact, Cardio Cap II, Critical Care, Light) DX-1 (10F)

2199387 Fakuda Denshi (DS3300 series) FD-2 (12M)

2199682 GE Marquette Medical Corametrics (115, 116, 142, 145, 556) CM-3 (Nicolet round – 12M)

2198893 GE Marquette Medical (PPG/E for M DR) EM-1 (6F)

2198978 GE Marquette Medical (7000 and TRAM-AR series only) MQ-2 (8M round)

2199627 GE Marquette Medical (Dash, Eagle, Solar, Tram, and MacLab) MQ-3 (rectangular – 11M)

2198902 Hewlett Packard/Philips (78-300, 78-500, 78-800, Merlin/Viridia/ Omnicare (HP/Philips M1006B iBP module has a sensitivity of 5 uV/V/mmHg only. The HP-3 cable should be selected for this application.) HP-3 (12M 5 µV)

2198916 Hewlett Packard/Philips (78-300, 78-500, 78-800, Merlin/Viridia/Omnicare) HP-4 (12M 40 µV)

2199694 Hewlett Packard/Philips (8040A, M1350A) HP-8 (intrauterine pressure only – 12M 40 µV)

2198879 Invivo Research TK-1 (6M)

2198879 Ivy Biomedical (400 and 700 series) TK-1 (6M)

2198940 Medical Data Electronics (Escort series) PC-1 (6M)

2198933 Mennen Medical (Horizon series) MM-1 (6M)

2198879 North American Drager (Vitalert 2000) TK-1 (6M)

2198940 Physio Control (VSM series) PC-1 (6M)

2198879 Protocol System (Propaq series) TK-1 (6M)

2190955 Puritan Bennett PB 240 DX-1 (10F)

2199176 Quinton (Q Cath series) QM-1 (6M)

2198925 Siemens (SIRECUST series) [SM-1 and Siemens Medical Transducer Adapter (3368-383-E530U) used to run a single invasive BP channel on the Siemens Medical SC6000 and SC9000 series monitors] SM-1 (10M)

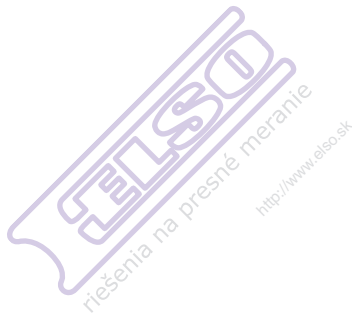
2199666 Siemens (Micor/Mingo) SM-3 (15M)

2198879 SpaceLabs (1050, 1700, PCMS series) (SpaceLabs adapters 700-0028-00 and 0120-0551-00 with TK-1 used when testing the new UltraView Command Module) TK-1 (6M)

2392173 Universal unterminated UU-1 (5-Pin DIN one end only)

2198893 Witt Biomedical EM-1 (6F)

3799486 PB Series IBP Cable (5M DIN)



About Fluke Biomedical

Fluke Biomedical is the world's leading manufacturer of quality biomedical test and simulation products. In addition, Fluke Biomedical provides the latest medical imaging and oncology quality-assurance solutions for regulatory compliance. Highly credentialed and equipped with a NVLAP Lab Code 200566-0 accredited laboratory, Fluke Biomedical also offers the best in quality and customer service for all your equipment calibration needs.

Today, biomedical personnel must meet the increasing regulatory pressures, higher quality standards, and rapid technological growth, while performing their work faster and more efficiently than ever. Fluke Biomedical provides a diverse range of software and hardware tools to meet today's challenges.

Fluke Biomedical Regulatory Commitment

As a medical test device manufacturer, we recognize and follow certain quality standards and certifications when developing our products. We are ISO 9001 and ISO 13485 medical device certified and our products are:

- CE Certified, where required
- NIST Traceable and Calibrated
- UL, CSA, ETL Certified, where required
- NRC Compliant, where required

Fluke Biomedical.

Better products. More choices. One company.

Fluke Biomedical

6045 Cochran Road
Cleveland, OH 44139-3303 U.S.A.

Fluke Biomedical Europe

Science Park Eindhoven 5110
5692EC Son, The Netherlands

For more information, contact us:

In the U.S.A. (800) 850-4608 or

Fax (440) 349-2307

In Europe/M-East/Africa +31 40 267 5435 or

Fax +31 40 267 5436

From other countries +1 (440) 248-9300 or

Fax +1 (440) 349-2307

Email: sales@flukebiomedical.com

Web access: www.flukebiomedical.com

©2011 Fluke Biomedical. Specifications subject to change without notice. Printed in U.S.A.
4/2011 3983499B D-EN-N

Modification of this document is not permitted without written permission from Fluke Corporation.