

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.

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	110 to 220 V, 50/60 Hz input, 6 V/3.5 A output. For best performance, the battery charger should be connected to a properly grounded ac receptacle											
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	1.0 mV. Other leads are proportional to Lead II (reference lead) in percentage per: <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Lead I: 70</td> <td style="width: 50%;">Lead V3: 100</td> </tr> <tr> <td>Lead II: 100</td> <td>Lead V4: 120</td> </tr> <tr> <td>Lead III: 30</td> <td>Lead V5: 112</td> </tr> <tr> <td>Lead V1: 24</td> <td>Lead V6: 80</td> </tr> <tr> <td>Lead V2: 48</td> <td></td> </tr> </table>		Lead I: 70	Lead V3: 100	Lead II: 100	Lead V4: 120	Lead III: 30	Lead V5: 112	Lead V1: 24	Lead V6: 80	Lead V2: 48	
Lead I: 70	Lead V3: 100											
Lead II: 100	Lead V4: 120											
Lead III: 30	Lead V5: 112											
Lead V1: 24	Lead V6: 80											
Lead V2: 48												
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. Preset and monitor testing sequence hypotensive condition is at 40 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 $\pm 10\%$, 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. Other leads are proportional to Lead II (reference lead) in percentage per: Lead I: 70 Lead II: 100 Lead III: 30 Lead V1: 24 Lead V2: 48 Lead V3: 100 Lead V4: 120 Lead V5: 112 Lead V6: 80
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	$\pm (10\% + 0.05 \text{ ohm})$
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 Ω ± 10%	
Exciter input range	2 to 16 V peak	
Exciter-input frequency range	DC to 5000 Hz	
Transducer sensitivity	5 μV/V/mmHg	
Pressure accuracy	± (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 ventricular)
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
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	0 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

- ProSim 4 Getting Started Manual
- 3931519** ProSim 4 Users Manual CD
- 2461946** Manual Inflation Bulb
- 2780003FG** Accessory Kit (tubings and fittings)
- 4026823** 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** PS4 ACC KIT, PROSIM 4 ACCESSORY KIT (Includes: Universal Unter BP Cable (2392173), HP/Phillips Intellivue IBP cable(2198902), GE Marquette Eagle/Dash/Solar IBP cable, Welch Allyn ProPaq/SpaceLabs Ultraview IBP cable (2198879), ProSim NIBP Mandrel Set (4308086), Cable Assembly, 4 Con, USB-A(M), USB-Mini-B(M) Cable (4034393), ProSIM4-4403, Adapter-4MM to Snap Connector Set (4026551), BPPS4, PROSIM 4 Battery Pack (4026823)
- 4308086** ProSim NIBP Mandrel Set
- 4026551** ECG Snap Adapter 4 mm and 3.2 mm ECG Banana Adapter Converter Modules (2 sets required)

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)

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