

# 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

<b>General specifications</b>												
<b>Temperature</b>	Operating	10 °C to 40 °C (50 °F to 104 °F)										
	Storage	-20 °C to +60 °C (-4 °F to +140 °F)										
<b>Humidity</b>	10% to 90% non-condensing											
<b>Altitude</b>	3,000 meters (9,843 ft)											
<b>Dimensions (L x W x H)</b>	18 cm x 9.3 cm x 5.5 cm (7.1 in x 3.7 in x 2.2 in)											
<b>Display</b>	LCD touch-screen color display											
<b>Communication</b>	USB port (for calibration and firmware updates only)											
<b>Power</b>	Lithium-ion rechargeable battery											
<b>Battery charger</b>	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											
<b>Battery life</b>	Four hours (minimum), 40 NIBP cycles typical											
<b>Weight</b>	0.88 kg (1.93 lb)											
<b>Safety standards</b>	IEC 61010-1:2001											
<b>Certifications</b>	CE, CSA, C-TICK N10140, RoHs											
<b>Electromagnetic compatibility (EMC)</b>	IEC 61326-1:2006											
<b>Detailed specifications</b>												
<b>Normal-sinus-rhythm waveform</b>												
<b>ECG reference</b>	The ECG amplitudes specified are for Lead II (calibration), from the baseline to the peak of the R wave. All other leads are proportional											
<b>Normal sinus rhythm</b>	12-lead configuration with independent outputs referenced to right leg (RL). Output to 10 universal ECG Jacks, color-coded to AHA and IEC standards											
<b>Amplitude</b>	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	
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Lead II: 100	Lead V4: 120											
Lead III: 30	Lead V5: 112											
Lead V1: 24	Lead V6: 80											
Lead V2: 48												
<b>Amplitude accuracy</b>	± 5% of setting Lead II											
<b>ECG rate</b>	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											
<b>Rate accuracy</b>	± 1% of setting											
<b>ECG waveform selection</b>	Adult (80 ms) or neonatal (40 ms) QRS duration											
<b>Power-on default</b>	60 BPM, 1.0 mV, adult QRS											

<b>Arrhythmia</b>	
<b>Atrial fibrillation</b>	Coarse or fine
<b>Premature ventricular contraction</b>	Left ventricular
<b>Ventricular tachycardia</b>	160 BPM or 200 BPM
<b>Ventricular fibrillation</b>	Coarse or fine
<b>Transvenous pacer pulse</b>	75 BPM, left arterial, 3 mV amplitude on lead II, accuracy $\pm 10\%$ , 1.0 ms width
<b>2nd degree AV block</b>	Type 1
<b>3rd degree AV block</b>	3rd degree AV block
<b>Asystole</b>	Asystole
<b>ECG performance testing</b>	
<b>Amplitude</b>	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
<b>Square wave</b>	60 ms at 2 Hz
<b>Respiration</b>	
<b>Rate</b>	0 (OFF), 10 BrPM to 100 BrPM in 10 BrPM steps
<b>Impedance variations (<math>\Delta \Omega</math>)</b>	1 $\Omega$
<b>Accuracy delta</b>	$\pm (10\% + 0.05 \text{ ohm})$
<b>Baseline</b>	500 $\Omega$ to circuit common, giving 1000 $\Omega$ between any two leads
<b>Accuracy baseline</b>	$\pm 5\%$
<b>Respiration lead</b>	LA or LL (default)



<b>Invasive blood pressure</b>		
<b>Channels</b>	1 electrically isolated from all other signals	
<b>BP output</b>	Circular DIN 5-pin	
<b>Input/output impedance</b>	300 Ω ± 10%	
<b>Exciter input range</b>	2 to 16 V peak	
<b>Exciter-input frequency range</b>	DC to 5000 Hz	
<b>Transducer sensitivity</b>	5 μV/V/mmHg	
<b>Pressure accuracy</b>	± (1% of setting + 1 mmHg) Accuracy guaranteed for dc excitation only	
<b>Static pressure</b>	0 mmHg, 80 mmHg, 160 mmHg, and 250 mmHg	
<b>Dynamic waveforms</b>	Synchronization	To ECG heartrate
	Chambers simulated and systolic/diastolic pressure:	
<b>Type</b>	<b>IBP (arterial)</b>	<b>IBP (left ventricular)</b>
<b>Adult</b>	60/30	60/0
<b>Adult</b>	120/80	120/0
<b>Adult</b>	150/100	150/0
<b>Adult</b>	200/150	200/0
<b>Neonatal</b>	35/15	35/0
<b>Neonatal</b>	70/40	70/0
<b>Non-invasive blood pressure</b>		
<b>Pressure units</b>	mmHg	
<b>Manometer (pressure meter)</b>	Range	10 mmHg to 400 mmHg
	Resolution	0.1 mmHg (for display purposes)
	Accuracy	± (1% reading + 1 mmHg)
<b>Pressure source</b>	Inflation bulb or device under test	



<b>NIBP simulations</b>	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)
<b>Leak test</b>	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
<b>Pressure relief test range</b>	100 mmHg to 400 mmHg	
<b>Presets and autosequences</b>		
<b>Presets</b>	Normal	
	Hypertensive	
	Hypotensive	
<b>Autosequences</b>	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.

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

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