

# ProSim 3 and 2

## Vital Signs Simulators

### Technical Data



Don't need a comprehensive patient monitor tester? The 6-in-1 ProSim 3 and 4-in-1 ProSim 2 Vital Signs Simulators are clear choices for biomedical engineers and field service technicians that need a quality, feature-rich device with high portability. Choose one of these modern vital signs simulators for preventive maintenance, troubleshooting and repair.

The ProSim 3 and 2 feature the perfect amount of features for testing in the field. We like to call it the Just Right feature set, and it includes:

- ECG
- pacemaker
- arrhythmia and performance testing
- respiration
- invasive blood pressure
- temperature
- cardiac output (ProSim 3 only)
- fetal/maternal (ProSim 3 only)

### Key features

- Portable, for evaluating the performance of patient monitors in the field
- 20 % lighter and 25 % smaller than preceding technology
- **Just Right** feature set includes: ECG, pacemaker, arrhythmia and performance testing, respiration, invasive blood pressure, temperature, cardiac output (ProSim 3 only), fetal/maternal (ProSim 3 only)
- 43 high-quality waveforms
- With four IBP channels, ProSim 3 tests even the highest acuity scenarios
- Stay-connected ECG posts for secure lead connections
- Improved user interface and online Advantage Training demos
- Upgraded DIN connectors ensure consistency with the ProSim family; minimize cable compatibility issues
- Field upgradeable, and easily paired with other devices for comprehensive testing
- ProSim 3 and 2 are 510(k) cleared products

## Specifications

General specifications		
Temperature	Operating	10 °C to 40 °C (50 °F to +104 °F)
	Storage	-25 °C to +50 °C (-13 °F to +122 °F)
Humidity	10 % to 80 % non-condensing	
Altitude	2,000 meters (6,562 ft)	
Dimensions (LxWxH)	14.0 cm x 20.6 cm x 4.5 cm (5.5 in x 8.2 in x 1.8 in)	
Display	LCD greyscale display	
Communication	USB device upstream port	
Power	Two 9 V alkaline batteries	
Battery life	8 hours continuous operation	
Weight	0.47 kg (1 lb, 4 oz)	
Safety standards	IEC 61010-1, Pollution degree 2	
Certifications	CE, CSA, C-TICK N 10140, 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	0.05 mV to 0.45 mV (0.05 mV steps); 0.5 mV to 5.5 mV (0.5 mV steps)	
Amplitude accuracy	± 2 % of setting Lead II. All other leads ± 5 %	
ECG rate	30, 40, 45, 60, 80, 90, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280 and 300 BPM	
Rate accuracy	± 1 % of setting	
ECG waveform selection	Adult (80 ms) or pediatric (40 ms) QRS duration	
ST-segment elevation	Adult mode only: -0.8 mV to +0.8 mV (0.1 mV steps)	
	Additional steps: +0.05 mV and -0.05 mV	
Power-on default	80 BPM, 1.0 mV, adult QRS, ST-segment elevation of 0 mV, and a P-R interval of 0.16 seconds	
Pacemaker waveform		
Pacer pulse	Amplitude	0 (off), 1, 2, 5, 10 mV ± 10 % for lead II (reference lead) with other leads proportional as for performance waves.
	Accuracy	Reference lead II: ± (5 % setting + 0.2 mV)
Pacer pulse width	0.1, 0.5, 1.0, 1.5, 2.0 ms ±5%	

<b>Paced arrhythmias</b>	Atrial 75 BPM
	Asynchronous 75 BPM
	Demand with frequent sinus beats
	Demand with occasional sinus beats
	Atrio-ventricular sequential
	Noncapture (one time)
	Nonfunction
<b>Power-on default</b>	Off
<b>Arrhythmia</b>	
<b>Baseline NSR</b>	80 BPM
<b>PVC focus</b>	Left focus, standard timing (except where specified)
<b>Supraventricular arrhythmia</b>	Atrial fibrillation (coarse or fine); atrial flutter sinus arrhythmia; missed beat (one time); atrial tachycardia; paroxysmal atrial tachycardia; nodal rhythm; and supraventricular tachycardia
<b>Premature arrhythmia</b>	(All one-time events) Premature atrial contraction (PAC); premature nodal contraction (PNC); PVC1 left ventricular; PVC1 left ventricular, early; PVC1 left ventricular, R on T; PVC2 right ventricular; PVC2 right ventricular, early; PVC2 right ventricular, R on T; and multifocal PVCs
<b>Ventricular arrhythmia</b>	PVCs 6, 12, or 24 per minute; frequent multifocal PVCs; bigeminy; trigeminy; multiple PVCs (one-time run of 2, 5, or 11 PVCs); ventricular tachycardia; ventricular fibrillation (coarse or fine); and asystole
<b>Conduction defect</b>	First-, second-, or third-degree AV block; and right- or left-bundle-branch block
<b>Power-on default</b>	None (off)
<b>ECG performance testing</b>	
<b>Amplitude</b>	0.05 to 0.45 mV (0.05 mV steps), 0.5 to 5.5 mV (0.5 mV steps)
<b>Pulse wave</b>	30, 60 BPM, with 60 ms pulse width
<b>Square wave</b>	2.0, 0.125 Hz
<b>Triangle wave</b>	2.0, 2.5 Hz
<b>Sine wave</b>	0.5, 5, 10, 40, 50, 60, 100 Hz
<b>R-wave detection waveform</b>	Haver-Triangle
<b>R-wave rate</b>	30, 60, 80, 120, 200, and 250 BPM
<b>R-wave width</b>	20 to 200 ms (10 ms steps) Additional Steps: 8, 10, and 12 ms
<b>Rate accuracy</b>	± 1 %
<b>Amplitude accuracy</b>	± 2 %, Lead II (Exception: ± 5 % for R waves ≤ 20 ms)
<b>Power-on default</b>	None (off)
<b>Fetal/Maternal ECG (ProSim 3 only)</b>	
<b>Fetal heart rate (Fixed)</b>	60, 90, 120, 140, 150, 210 and 240 BPM
<b>Fetal heart rate (IUP)</b>	140 BPM at beginning, then varies with pressure
<b>Intrauterine-pressure waveforms</b>	Early deceleration, late deceleration, and uniform acceleration
<b>Wave duration</b>	90 seconds, bell-shaped pressure curve, from 0 to 90 mmHg and returning to 0
<b>IUP period</b>	2, 3, or 5 minutes; and manual
<b>Power-on default</b>	FHR 120 BPM, early deceleration, manual

Invasive blood pressure	
Channels	4, each independently settable with identical parameters and are individually electronically isolated from other signals
Input/output impedance	300 $\Omega \pm 10\%$
Exciter input range	2.0 to 16.0 V rms
Exciter-input frequency range	DC to 5000 Hz
Transducer sensitivity	5 or 40 $\mu\text{V/V/mmHg}$
Pressure accuracy	$\pm 2\%$ of setting + 2 mmHg (valid for dc excitation only)
Static Levels, Channel 1	-10, 0, 80, 160, 240, 320, 400 mmHg
Static Levels, Channel 2	-10, 0, 50, 100, 150, 200, 240 mmHg
Static Levels, Channel 3 (ProSim 3 only)	-5, 0, 20, 40, 60, 80, 100 mmHg
Static Levels, Channel 4 (ProSim 3 only)	-5, 0, 20, 40, 60, 80, 100 mmHg
Dynamic waveforms, Channel 1	Arterial: 120/80, Radial Artery: 120/80, Left ventricle: 120/00, Right ventricle: 25/00
Dynamic waveforms, Channel 2	Arterial: 120/80, Radial artery: 120/80, Left ventricle: 120/00, Right atrium (central venous or CVP): 15/10, Right ventricle: 25/00, Pulmonary artery: 25/10, Pulmonary-artery wedge: 10/2, Left atrium: 14/4
Dynamic waveforms, Channel 3	Arterial: 120/80, Radial artery: 120/80, Left ventricle: 120/00, Right atrium (central venous or CVP): 15/10, Right ventricle: 25/00, Pulmonary artery: 25/10, Pulmonary-artery wedge: 10/2, Left atrium: 14/4
Dynamic waveforms, Channel 4	Swan-Ganz sequence, Right atrium (CVP), Right ventricle (RV), Pulmonary artery (PA), Pulmonary-artery wedge (PAW)
Respiration artifact	BP delta changes from 3 to 16 mmHg
Output connector	DIN 5-Pin
Power-on default	0 mmHg
Respiration	
Rate	0 (OFF), 15, 20, 30, 40, 60, 80, 100, 120 BrPM
Waves	Normal or ventilated
Ratio (inspiration: expiration)	1:1
Impedance variations ( $\Delta \Omega$ )	0.2, 0.5, 1 or 3 $\Omega$ peak-to-peak variation of lead impedance
Accuracy delta	$\pm 10\%$
Baseline	500, 1000, 1500, 2000 $\Omega$ , Leads I, II, III
Accuracy baseline	$\pm 5\%$
Respiration lead	LA or LL
Apnea selection	OFF, 12, 22 or 32 seconds (one-time events), or continuous (Apnea ON = respiration OFF)
Power-on default	20 BrPM, delta 1.0 $\Omega$ , 1000 $\Omega$ baseline
Temperature	
Temperature	0 °C (32 °F), 24 °C (75.2 °F), 37 °F (98.6 °C), and 40 °C (104 °F)
Accuracy	$\pm 1^\circ \text{C}$
Compatibility	Yellow Springs, Inc. (YSI) Series 400 and 700

<b>Output connector</b>	Circular DIN 4-pin
<b>Power-on default</b>	0 °C (42 °F)
<b>Cardiac output (ProSim 3 only)</b>	
<b>Catheter type</b>	Baxter Edwards, 93a-131-7f
<b>Calibration coefficient</b>	0.542 (0 °C) injectate), 0.595 (24 °C injectate)
<b>Blood temperature</b>	37 °C (98.6 °F) $\pm$ 2 %
<b>Injectate volume</b>	10 cc
<b>Injectate temperature</b>	0 °C or 24 °C $\pm$ 2 % value
<b>Cardiac output</b>	2.5, 5, 10 liters per minute $\pm$ 5 %
<b>Faulty-injectate curve</b>	Waveform for simulation available
<b>Left-to-right shunt curve</b>	Waveform for simulation available
<b>Calibrated pulse</b>	1.5
<b>Output connector</b>	DIN 7-PIN
<b>Power-on default</b>	2.5 liters perminute, 0 °C injectate

## Ordering information

### Models/descriptions

**ProSim 3** ProSim Vital Signs Simulator

**ProSim 2** ProSim Vital Signs Simulator

### Standard accessories

ProSim 2/3 Instruction Sheet (multi-language)

**4253822** ProSim 2/3 Users Manual CD

**614487** Two 9-volt alkaline batteries (minimum 8 hours continuous use)

**2392173** IBP Cable, unterminated

**2392199** 3010-0289FG, CI-3 Cable Assembly (Cardiac Output Box; ProSim 3 only)

**1671807** USB cable

**2248623** ProSim 2/3 Carrying Case

### AC power cords

**4219453** AC/DC Power Supply

**769422** AC Power Cord (Schuko)

**284174** AC Power Cord (USA)

**769455** AC Power Cord (UK)

**658641** AC Power Cord (Australia)

**2200218** AC Power Cord (Denmark)

**2200229** AC Power Cord (India)

**2200241** AC Power Cord (Israel)

**2198785** AC Power Cord (Italy)

**769448** AC Power Cord (Switzerland)

### Optional accessories

**2523334** YSI 400 Series (UT-4)

**2199019** YSI 700 Series (UT-2)

**4022300** Cardiac output switch for GE



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### About Fluke Biomedical

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### Fluke Biomedical Regulatory Commitment

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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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*Better products. More choices. One company.*

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