BIOSIGNAL SIMULATOR

Purpose

A Patient simulator mimics the biological signals such as ECG, EMG, EEG etc by means of a software with different programmable scenarios of healthy and ill patients and allows the students to learn how to interpret and perform the most important bio-signal measurements.

Basic Details

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Leads	12 Leads
Power requirements	220 VAC 50/60 Hz
Electrodes	Surface Electrodes
Temperature range	-25°C to 70°C
Storage	Laptop / PC
Output	Digital Storage Oscilloscope

ECG MEASUREMENT SYSTEM
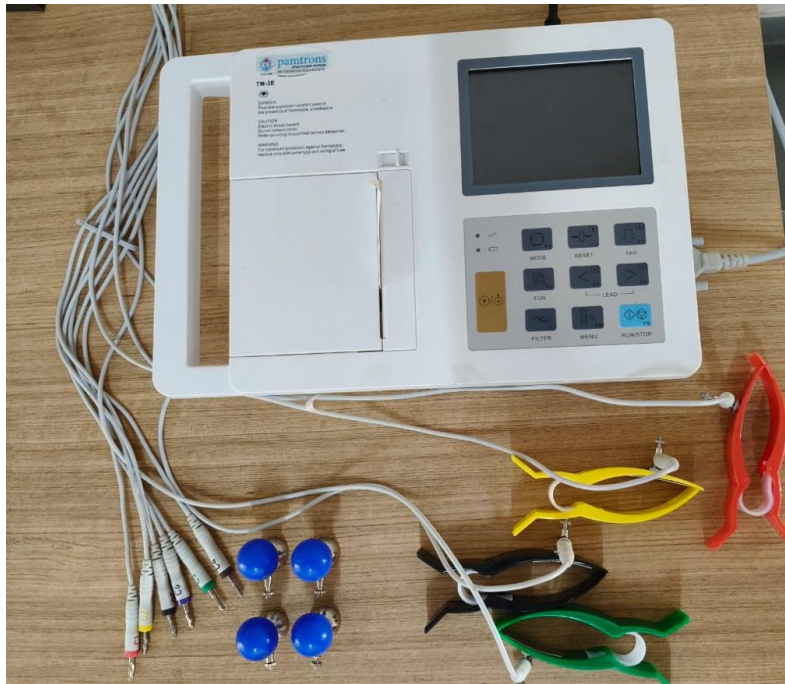
Purpose

An electrocardiogram, also called an ECG or EKG, is a simple and painless test that measures the electrical impulses of your heart to check for signs of heart disease. It's done through small electrode patches that are attached to the skin of the chest, arms, and legs and the results are displayed on a screen.

Basic Details

Sensitivity Threshold	≤20μ V
Paper speed	25,50mm/s
Weight	5 kg
Dimensions	230mm X 310mm X 100mm
Frequency	0.05Hz - 150Hz(-3dB)
Power Supply	DC 14.4V(2000mAh)

EEG MEASUREMENT SYSTEM
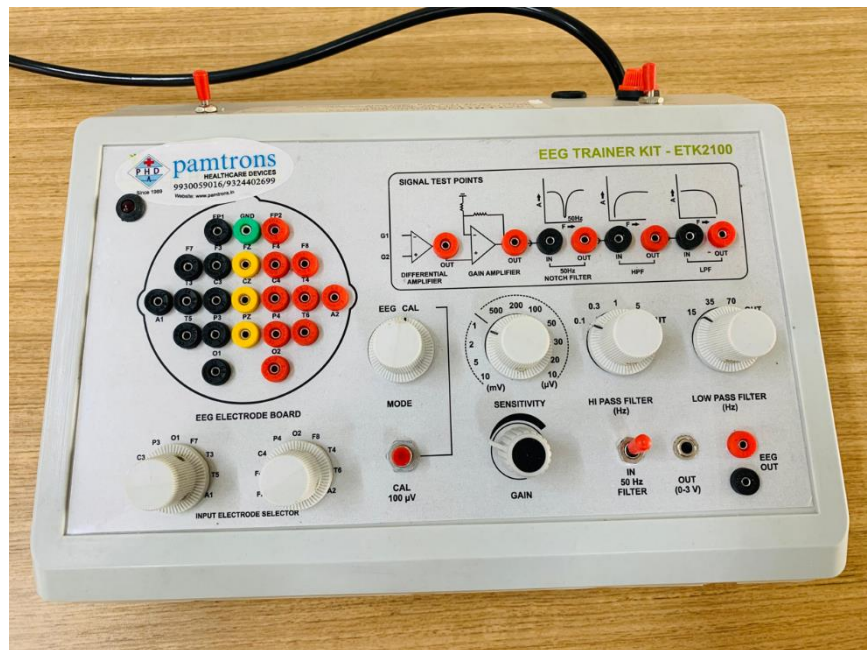
Purpose

An electroencephalogram (EEG) is a test that measures electrical activity in the brain. This test also is called an EEG. EEG devices can be used in the classroom to complement lab research by providing insights into brain processes in real-world situations.
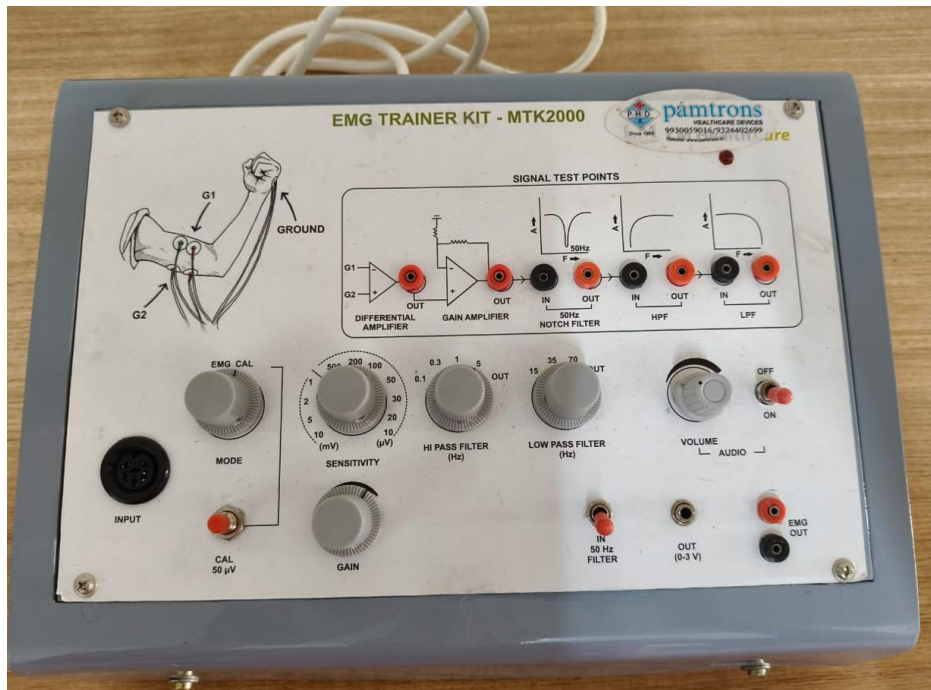
Basic Details

Leads	3 lead system
Placement method	10/20 electrode method
Gain	Variable
Sensitivity Range	10mV to 10
Filter Range	5 Hz to 70 Hz
Calibration	Upto 50 µV

EMG MEASUREMENT SYSTEM

Purpose

Electromyography (EMG) is a test that measures the electrical activity of muscles to help diagnose and monitor neuromuscular and muscular disorders. The size and shape of the electrical wave produced by the muscle contraction indicates how well the muscle responds to nerve stimulation.
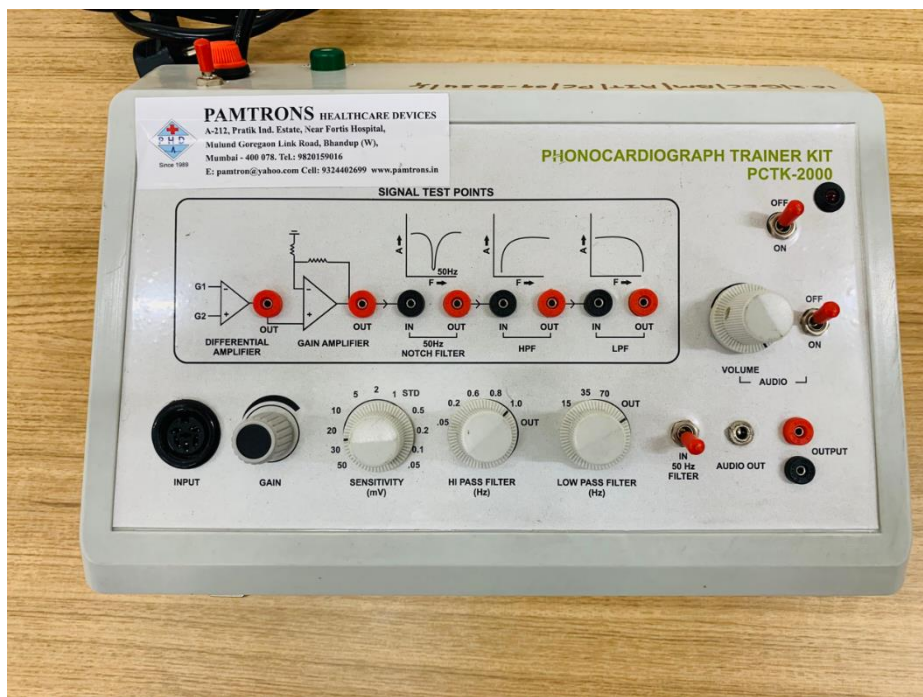
Basic Details

Display Sensitivity	0.05µV/div ~ 20,000µV/div
Frequency-Amplitude Characteristics	0.2Hz ~10 kHz
Scan Speed	1ms/div ~ 5000ms/div
High-Pass Filter	10Hz ~ 20,000Hz
Low-Pass Filter	0.1Hz ~ 5000Hz
Common Mode Rejection Ratio	≥110dB
Noise Voltage	0.4µV (RMS)

PCG MEASUREMENT SYSTEM

Purpose

A phonocardiogram (PCG) plots recordings of a heart sound and murmur during the cardiac cycle, and analysis of a PCG signal is useful in detecting abnormalities of a heart by using time-frequency analysis and classifications of the heart signals.

Basic Details

Sensitivity	0.05 – 50 mV
Frequency	50 Hz (Notch Filter cpntrol)
Accessories	Headphones
Filter Range	50Hz - 1500 Hz
Noise Voltage	0.4µV (RMS)

COLORIMETER

Purpose

A photo colorimeter measures how much light passes through a substance and compares it to a pure solvent. The amount of light absorbed by a substance is directly proportional to its concentration.

Basic Details

Wavelength range	405nm to 700 nm
Filters	8 Digital LED Based Filters
Filter wavelength:	405 nm, 450nm, 480nm, 520nm, 540nm, 578nm, 620nm, 700nm
Accuracy	± 0.01 O.D
Stability	± 0.02 O.D. per hour
Sample Volume	1ml Minimum
Power	220Volt AC – 10 Volt
Display Parameter	Absorbance and %Transmittance

AUDIOMETER

Purpose

An audiometer is a device used to evaluate a person's hearing by presenting tones and words at different levels and frequencies. The results of the test can help determine if the patient needs a referral for medical treatment or hearing aids.

Basic Details

Frequency	250, 500, 1000, 2000, 4000 & 8000 Hz +/-
Hearing loss in dB	10 to 80dB +/-
Output	EP for Head phone Right & Left
Audio Output	4mm Sockets
Display	PC software
Power Supply	230V 50Hz
Dimensions	250 X 300 X 100mm+/-
Masking selection	No masking, Right & Left. Masking adjustable

PACEMAKER AND PACEMAKER SIMULATOR

Purpose

Pacemakers send electrical pulses to help your heart beat at a normal rate and rhythm. Pacemakers can also be used to help your heart chambers beat in sync so your heart can pump blood more efficiently to your body. Students can study pacemakers to learn about how they treat and manage heart rhythm disorders, and how they can improve the quality of life for patients:

Basic Details

Modes	Two Fixed Mode and Demand Modes
Switch	Toggle
Rate Control	Pulse Rate 30 to 150 BPM±
Positive Pulse Duration	2mS±
Input ECG sync	9V±
Electrodes	Disc type
Power requirements	220 VAC 50/60 Hz

DEFIBRILLATOR WITH AED TRAINER

Purpose

Automated external defibrillators (AEDs) are medical devices that can analyze the heart's rhythm and deliver an electrical shock to help the heart re-establish an effective rhythm. Studying the circuit of a defibrillator can help students understand the physical processes involved in defibrillation.

Basic Details

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Modes	Three is Instant and Sync
Output	Low output Voltage
Output Display	DSO
Electrodes	100mm Paddle Disc electrodes
Dimension	150 X 150 x 250mm±
Power Supply	230V/ 50Hz

HAEMODIALYSIS

Purpose

Hemodialysis is a treatment to filter wastes and water from your blood, as your kidneys did when they were healthy.

Basic Details

Dialysate Bath	37 to 35.5. ºC
BP Range	120/80 mmHg
LCD Display	16X2
Detectors	Blood Leak & Air bubble
Power Supply	230V, 50Hz

HEART - LUNG MACHINE
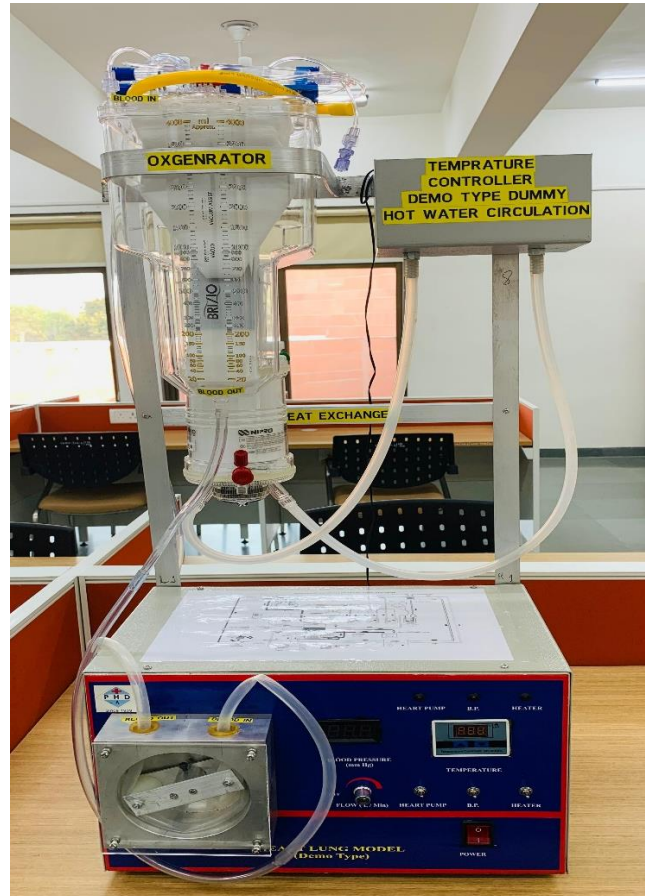
Purpose

A heart-lung machine is an apparatus that does the work both of the heart (i.e., pumps blood) and the lungs (i.e., oxygenates the blood) during, for example, open-heart surgery. Students can study the heart-lung machine circuit to learn how it provides vital organs with oxygen and perfusion while the heart is stopped.

Basic Details

Blood Tank	1000ml
Temperature Controller	0 to 400°C
Sensor	PT100 sensor
LCD Display	16X2
Detectors	Blood Bubble & Blood Leak Detector
Power Supply	230 VAC 50/60 Hz

SHORT-WAVE DIATHERMY

Purpose

Short-wave diathermy is a physiotherapy technique that allows deep heat to be produced in the joints and soft tissue to promote healing. Students can learn about the parts of an SWD machine, how heat is produced, and how the machine is used to treat conditions.

Basic Details

Output Frequency	27.12 MHz
Pulse rate	20, 50, 100, 150, 200, 250,Hz
Power Output	500 Watt cont. 1000 watt Pulse
Timer	0 to 30 Minutes
Display	LCD display
Wave Shape	Mono Phonic
Pre Programme	20
RF Power Source	RF Generator
Input	220V AC-50Hz

PULMONARY FUNCTION ANALYZER

Purpose

Spirometer intended to test lung function by measuring the Forced Vital Capacity (FVC), Slow Vital Capacity (SVC) and the Maximum Voluntary Ventilation (MVV) in people of all ages except infants and neonants. Students can learn how a spirometer measures lung function and capacity, and how the measurements are used to diagnose and monitor lung conditions.

Basic Details

Sensor	Flow Sensor
Flow Range:	-10 to ± 16 Lts./sec . BTPS
Accuracy	± 1% with 3Liters Calibration Syringe
Flow Detection	Volume Differential
Turbine Sensor	Infrared Transmitter / Receiver
Power Supply	220V AC-50Hz

SYRINGE PUMP

Purpose

Syringe pumps are motorized devices that accurately control the movement of a fluid from a syringe by mechanically inserting or retracting the plunge.

Basic Details

Range of Syringe	10ml, 20ml, 30ml & 50/60ml
Battery	6 Hrs
Levels	Upto 3 level occlusion pressure
Accuracy	±2%
Water proof level	IPX4
Power Supply	220V AC-50Hz

INFUSION PUMP

Purpose

Infusion pumps are medical devices that deliver fluids and medications into a patient's body in a controlled manner. Students can learn what components such as sensors, detector, etc. are used to control and regulate the fluids.

Basic Details

Rate	200ml/h
Purge Rate	1000ml/h (100 ml/h step)
Occlusion	Upto 3 level occlusion pressure
Flow Rate Accuracy	Within ±5%
Atmospheric Pressure	106.0KPA
Power Supply	220V AC-50Hz
Bubble Detector	Ultrasonic Wave Detector; Detection Sensitivity 25mu/l
Mechanical Precision	Within +/- 2%