Small Animal Physiological Monitoring System

ECG • Respiration • Heart Rate • Warming & Temperature
Blood Pressure • SpO_2 • $EtCO_2$

Harvard Apparatus
An Affiliate of Harvard Bioscience, Inc.

Small Animal Physiological Monitoring System

The Small Animal Physiological Monitoring System is an instrument that measures multiple physiological parameters on one single small platform.

The system comes complete with a heated monitoring platform (for mouse or mouse/rat), a rectal probe, electrode gel , an Android tablet with a protective sleeve and stand, and wireless communication module. These components are all supplied in a sturdy case for storage and transport.

The platform includes four electrocardiogram (ECG) surface electrodes, a respiration sensor and a heated surface that can be used at a set temperature or in a homeothermic setup using the rectal probe. Additional options to monitor oxygen saturation (SpO2), blood pressure and exhaled CO2 (EtCO2) can be purchased separately.

Benefits and Software

A head fixation option is also available. It includes ear bars, a tooth bar and either a nose clamp or an anesthesia mask. The head fixation device is screwed onto the platform, but can easily be removed depending upon the application.

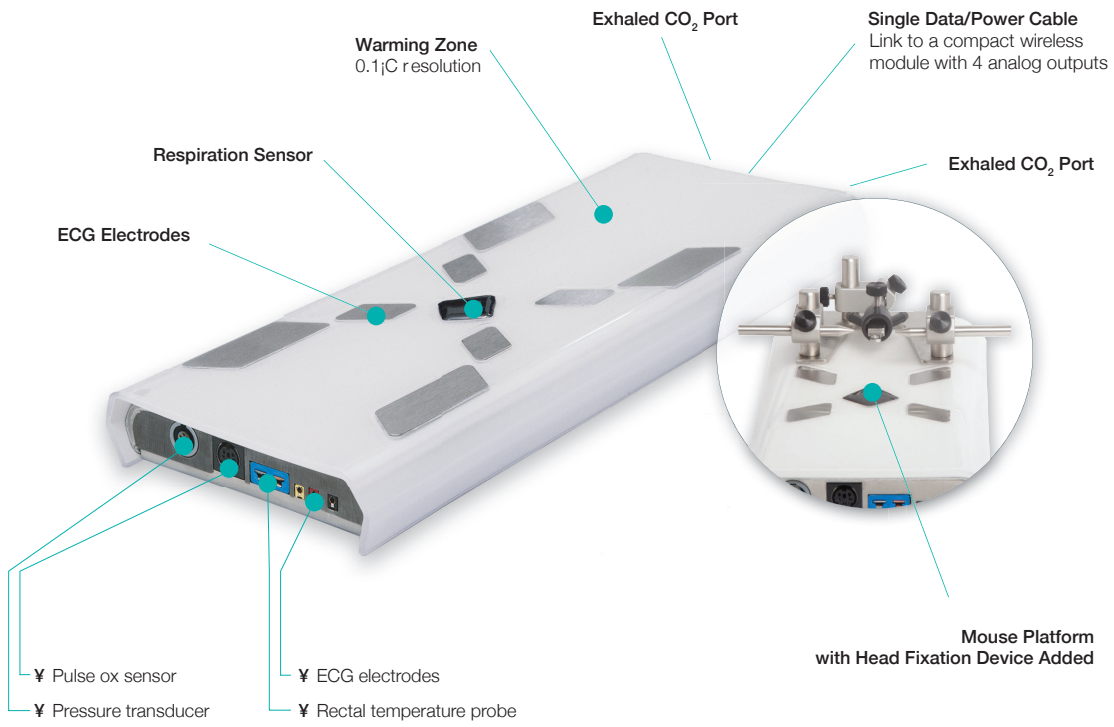
The system has many benefits for surgical procedures. It requires less setup time at the beginning of procedures. A single data/power cable connects to a small wireless communication module, reducing the required space and the number of wires around the animal.

Monitoring software is pre-installed on the Android tablet. All data is transferred to the Android tablet by wireless for display and saving. A real-time display provides numeric values as well as graphic waveforms that can be customized by the user. Multiple signals can be displayed on each of three wavefrom graphs.

At the end of experiments, recorded data can easily be transferred to any computer for analysis. Scripts and utilities are provided to convert data in LabChart or CSV format and to display signals in Excel and MATLAB.

Heated Platform

Rat and mouse platform shown.



Physiological Parameters

ECG
Integrated electrodes under the paws & external electrodes

Respiration
Waveform acquired with a sensor under the animal

Heart & Breath Rate
Real-time display from the ECG and respiration waveform

Warming & Temperature
Heated platform and rectal probe for precise control and monitoring

Blood Pressure (option)
Connection for a pressure transducer (purchased separately)

SpO2 (option)
Pulse oximetry and oxygen saturation with a paw/tail sensor (included with option)

Exhaled CO2 (option)
Gas ports for precise CO2 measurements (must be used with an external ventilator)

Advanced Display Interface

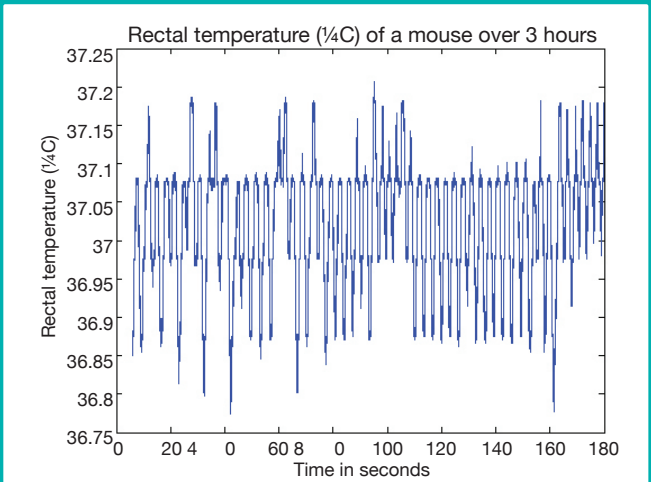
Touchscreen display
Pinch to zoom on waveforms (works with surgical gloves).

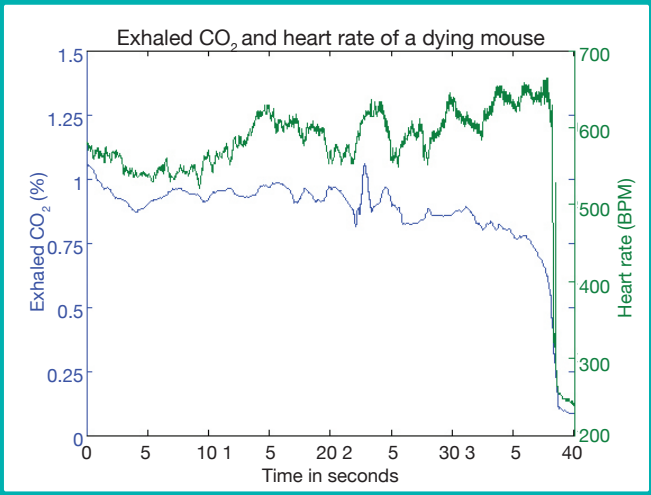
1 to 5 second waveforms
Select any signal to display.

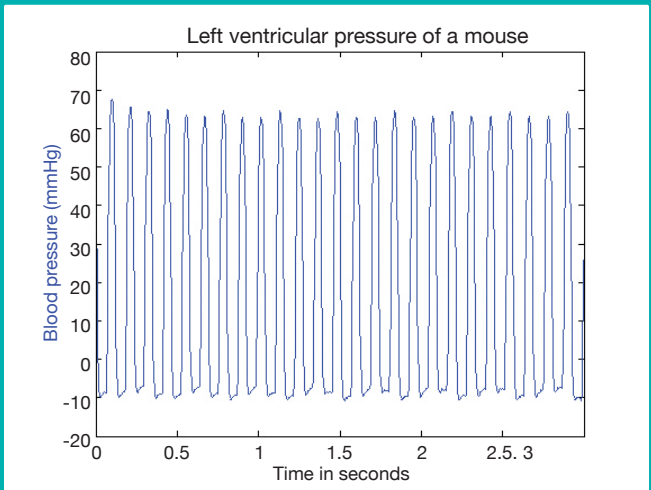
1 to 30 minute trends
View temperature, heart and breath rate trends, and numeric values.

Easy data saving
Add notes, save and export data for an easy analysis.

Example Waveforms







Specifications

ECM
Display Leads I, II, III, aVL, aVR & aVF
Supine or prone position
1 kHz, 24-bit acquisition
3 external electrode connections (2 mm)
RESPIRATION
250 Hz acquisition
Heart and breath rate
200 to 800 beats/min
25 to 330 breaths/min
Calculated every second
WARMING & TEMPERATURE
Heated surface up to 45°C
0.1°C resolution
Closed loop PID controller keeps the animal within ±0.1°C of set temperature
BLOOD PRESSURE
Full waveform display
Systolic and diastolic numeric values
Comes standard with Redel 5-pin connector
250 Hz acquisition, 24-bit bridge amplifier
EXHALED CO_2
Connect ventilator directly to the platform (1/8 inch tubing)
1 Hz refresh rate
0.1% accuracy
SpO_2
80 to 100% saturation
250 Hz, 24-bit acquisition
Red and infrared channel display

System Information

HEATED PLATFORM
Easy to clean surface
10 x 21 x 2.5 cm (mouse)
12 x 30.4 x 2.5 cm (rat and mouse)
TABLET
8-inch Android tablet (10-inch available)
High resolution touchscreen display
Capacity of over 400 hours of saved data
5 to 8 hours battery life
USB cable and charger
WIRELESS COMMUNICATION MODULE
Wireless and analog outputs are in a separate enclosure to avoid interference
9 x 11 x 2.5 cm
100 to 240 V power supply 15 to 25 meters typical range between the communication module and the display unit
ANALOG OUTPUTS
4 configurable outputs
BNC connectors, ±5 V ranges
1 kHz, 16-bit refresh rate
DATA ANALYSIS
.csv conversion tool
MATLAB® & Excel® import and display scripts
Compatible with third-party analysis software (LabChart)
SpO_2
80 to 100% saturation
250 Hz, 24-bit acquisition
Red and infrared channel display

Ordering Information

ITEM NUMBER	DESCRIPTION
75-1500*	Physiological Monitoring System for Mouse (10 g to 100 g)
75-1501*	Physiological Monitoring System for Rat and Mouse (10 g to 600 g)
75-1502	Blood Pressure Option (BP Transducer purchased separately)
75-1503	End Tidal CO_2 Option
75-1504	SpO_2 Option (Pulse Ox Sensor included with option)
73-4905	APT300 Pressure Transducer for Small Animal Physiological Monitoring System
73-5019	ECG 3-Needle Electrodes, 29 gauge
73-1539	Nose Cone Holder
75-1540	Head Fixation Kit with Gas Anesthesia Mask for 75-1500 Platform
75-1541	Head Fixation Kit with Nose Clamp for 75-1500 Platform
75-1542	Head Fixation Kit with Gas Anesthesia Mask for 75-1501 Platform (for mouse only)
75-1543	Head Fixation Kit with Nose Clamp for 75-1501 Platform (for mouse only)

*NOTE: At the end of the part number add EU for Europe, UK for United Kingdom and CN for China models.

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