

# Small Animal Physiological Monitoring System

ECG • Respiration • Heart Rate  
Warming & Temperature • Blood Pressure  
SpO<sub>2</sub> • EtCO<sub>2</sub>



**Small Footprint**

**Integrated & Ergonomic**

**Intuitive Touchscreen**

**Real-Time Numeric & Graphic Display**





## Physiological Monitoring System

The Small Animal Physiological Monitoring System is an instrument integrating multiple physiology parameters on one single small platform.

The objective behind this new instrument is to provide superior monitoring results, while making surgery and other manipulations on small animals easier.

The platform integrates monitoring of the rectal temperature, electrocardiogram (ECG), respiration, oxygen saturation (SpO<sub>2</sub>), blood pressure and exhaled CO<sub>2</sub> (EtCO<sub>2</sub>). It also includes a controlled heating surface to maintain the animal's body temperature at the desired level.

The system has many benefits regarding surgery procedures. It demands less installation time at the beginning of procedures and it reduces the required space and the number of wires around the animal. A single data/power cable connects to a small wireless communication module. All data is transferred to an Android tablet by Bluetooth for display and saving.

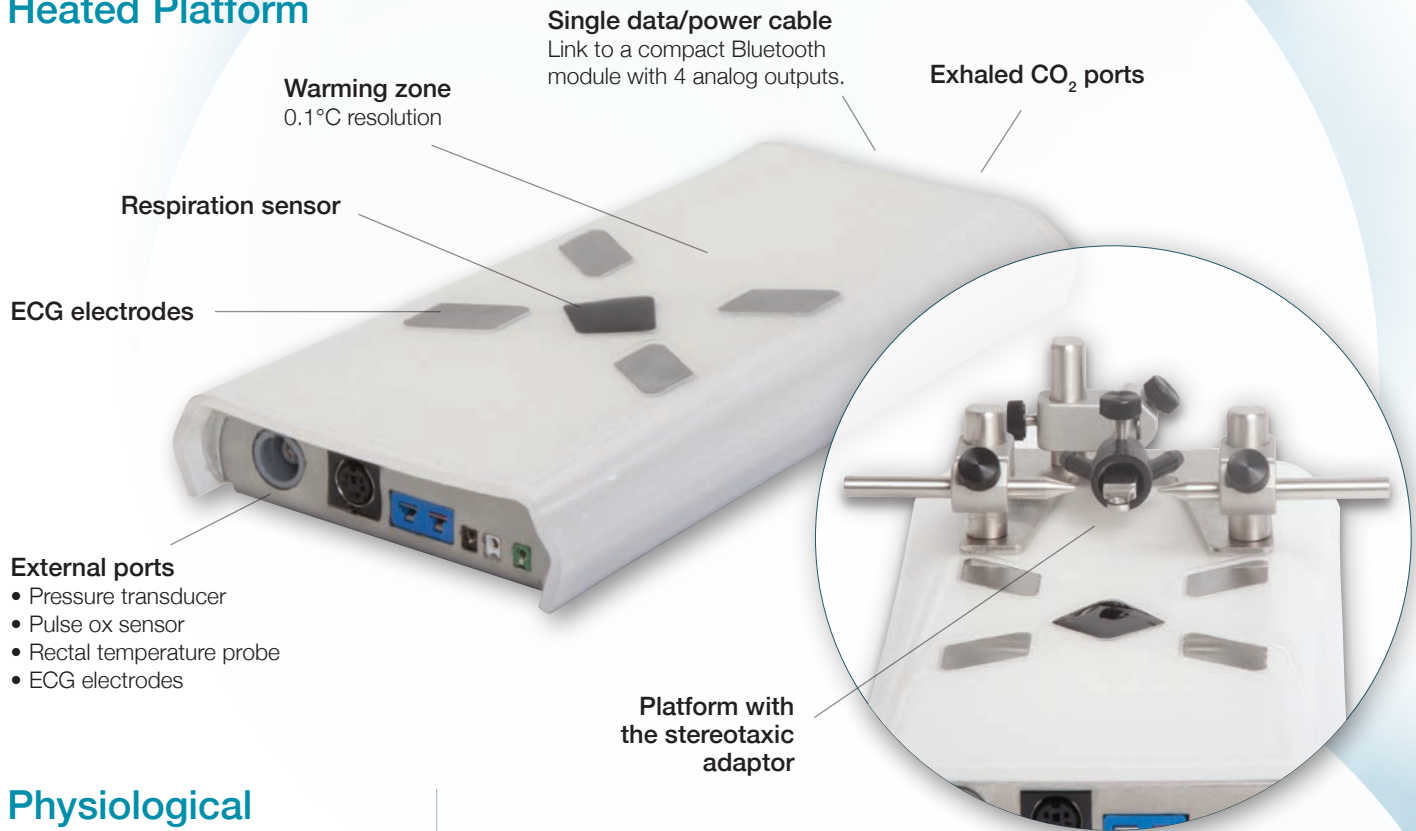
The Physiological Monitoring System features a real-time display which provides numeric values as well as waveforms that can be customized by the user. Multiple signals can be displayed on each of the three graphs.

The Physiological Monitoring System is available with a stereotaxic adaptor option, which includes ear bars, a tooth bar and either a nose bar or an anesthesia mask. The stereotaxic device is fixed to the platform, but can easily be removed depending upon the application.

The Physiological Monitoring System comes complete with a heated platform (for rats or mice), an Android tablet with case and stand, Bluetooth communication module, a rectal probe and electrode gel.

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



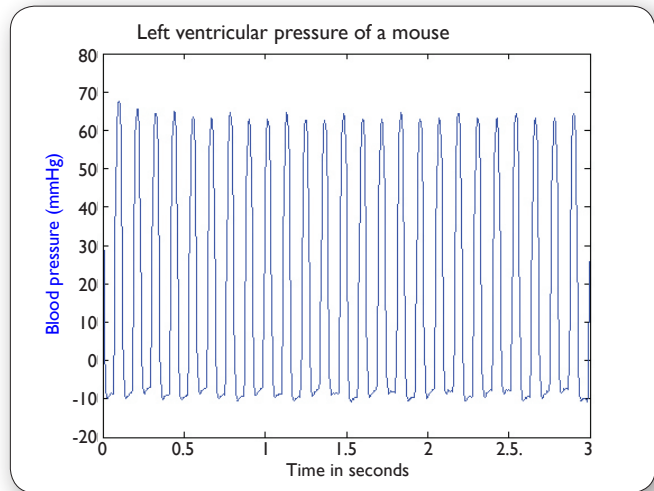
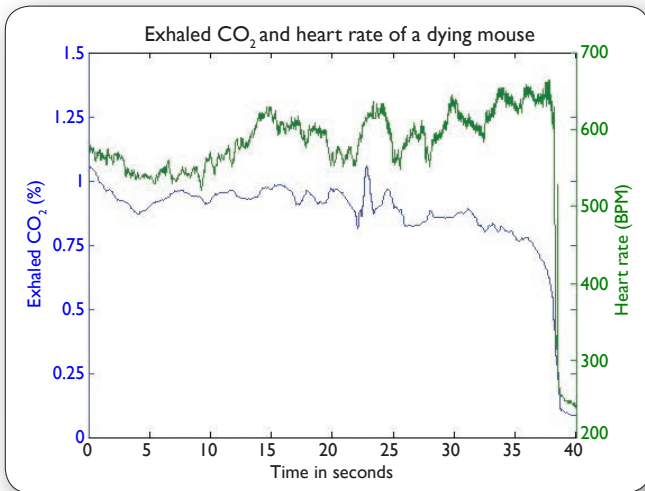
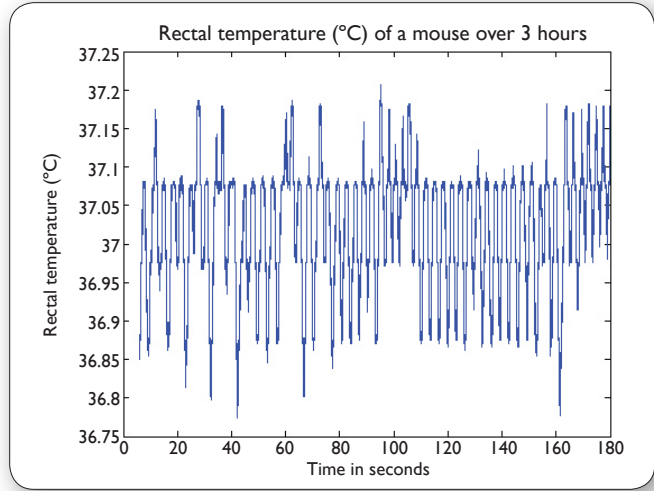
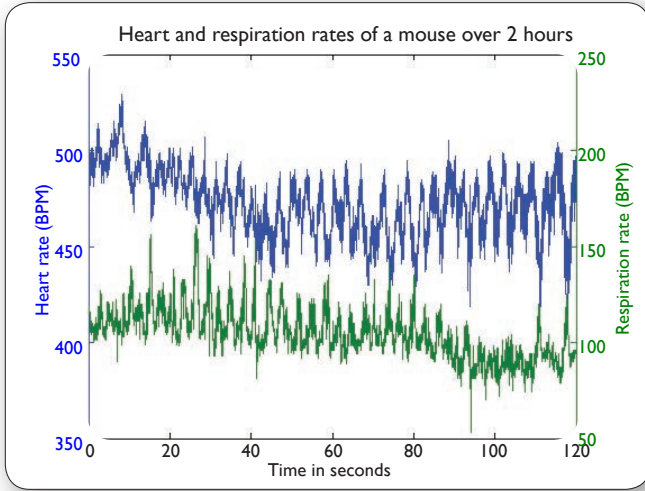
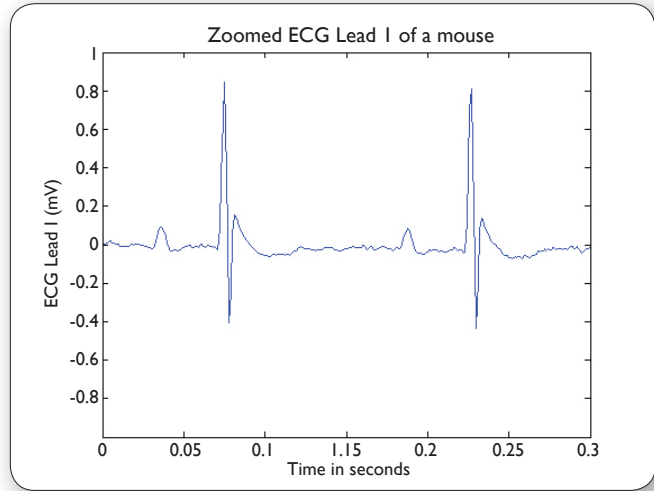
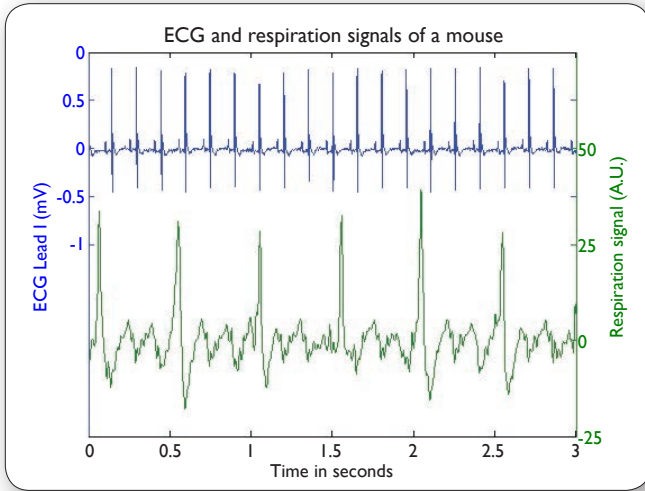
## Physiological Parameters

- **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
- **SpO<sub>2</sub> (option)**  
Pulse oximetry and oxygen saturation with a paw/tail sensor
- **Exhaled CO<sub>2</sub> (option)**  
Gas ports for precise CO<sub>2</sub> measurements (with an external ventilator)

## Advanced Display Interface



# Example Waveforms



## Detailed Specifications

### ECG

- Display Leads I, II, III, aVL, aVR & aVF
- Supine or prone position
- 1 kHz, 24-bit acquisition
- 3 external electrodes connections (2 mm)

### Respiration

- 250 Hz acquisition

### Heart & 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  $\pm 0.1^\circ\text{C}$  of set temperature

### Blood Pressure

- Full waveform display
- Systolic and diastolic numeric values
- Comes standard with Redel 5-pin connector
- Adaptor available for 8-pin DIN connector
- 250 Hz acquisition, 24-bit bridge amplifier

### Exhaled CO<sub>2</sub>

- Connect ventilator directly to the platform (1/8" tubing)
- 1 Hz refresh rate
- 0.1% accuracy

### SpO<sub>2</sub>

- 80 to 100% saturation
- 250 Hz, 24-bit acquisition
- Red & infrared channel display

## System Information

### Heated Platform

- Easy to clean surface
- 10 cm X 21 cm X 2.5 cm (mice)
- 12 cm X 27 cm X 2.5 cm (rats)

### Tablet

- 8" Android tablet (10.1" available)
- High resolution touchscreen display
- Capacity of over 400 hours of saved data
- 5-8 hours battery life
- USB cable and charger

### Communication Module

- Bluetooth and analog outputs are in a separate enclosure to avoid interferences
- 9 cm X 11 cm X 2.5 cm
- 100-240V power supply

### Bluetooth

- 15 to 25 meters typical range between the communication module and the display unit

### Analog Outputs

- 4 configurable outputs
- BNC connectors,  $\pm 5\text{V}$  range
- 1 kHz, 16-bit refresh rate

### Data Analysis

- .csv conversion tool
- MATLAB® & Excel® import and display scripts
- Compatible with third-party analysis software (LabChart)

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## Ordering Information

### Order No. Product

- 75-1500\* Physiological Monitoring System for Mice (10g to 100g)
- 75-1501\* Physiological Monitoring System for Rats (75g to 500g)
- 75-1502 Blood Pressure Option
- 75-1503 End Tidal CO<sub>2</sub> Option
- 75-1504 SpO<sub>2</sub> Option
- 75-1540 Stereotaxic Kit with Gas Anesthesia Mask
- 75-1541 Stereotaxic Kit with Nose Clamp

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

For more complete product details and part number listings please visit our website [www.harvardapparatus.com](http://www.harvardapparatus.com)

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