Small Animal Physiological Monitoring System

ECG • Respiration • Heart Rate • Warming & Temperature
Blood Pressure • SpO₂ • EtCO₂

Small Footprint
Integrated & Ergonomic
Intuitive Touchscreen
Real-Time Numeric & Graphic Display
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 Bluetooth 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.

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 Bluetooth 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 waveform 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.
**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)

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**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

ECG and respiration signals of a mouse

Heart and respiration rates of a mouse over 2 hours

Rectal temperature (°C) of a mouse over 3 hours

Exhaled CO₂ and heart rate of a dying mouse

Left ventricular pressure of a mouse
Specifications

**ECG**
- 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
- Adaptor available for 8-pin DIN connector
- 250 Hz acquisition, 24-bit bridge amplifier

**Exhaled CO₂**
- Connect ventilator directly to the platform (1/8 inch tubing)
- 1 Hz refresh rate
- 0.1% accuracy

**SpO₂**
- 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

**Bluetooth Communication Module**
- Bluetooth 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 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)

For more complete product details, please visit our website: www.harvardapparatus.com

**Ordering Information**

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Product</th>
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<tbody>
<tr>
<td>75-1500*</td>
<td>Physiological Monitoring System for Mouse (10 g to 100 g)</td>
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<tr>
<td>75-1501*</td>
<td>Physiological Monitoring System for Rat and Mouse (10 g to 600 g)</td>
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<td>75-1502</td>
<td>Blood Pressure Option (BP Transducer purchased separately)</td>
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<td>75-1503</td>
<td>End Tidal CO₂ Option</td>
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<td>75-1504</td>
<td>SpO₂ Option (Pulse Ox Sensor included with option)</td>
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<td>73-4905</td>
<td>APT300 Pressure Transducer for Small Animal Physiological Monitoring System</td>
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<td>73-5019</td>
<td>ECG 3-Needle Electrodes, 29 gauge</td>
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<td>75-1539</td>
<td>Nose Cone Holder</td>
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<td>75-1540</td>
<td>Head Fixation Kit with Gas Anesthesia Mask for 75-1500 Platform</td>
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<tr>
<td>75-1541</td>
<td>Head Fixation Kit with Nose Clamp for 75-1500 Platform</td>
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<td>75-1542</td>
<td>Head Fixation Kit with Gas Anesthesia Mask for 75-1501 Platform (for mouse only)</td>
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<td>75-1543</td>
<td>Head Fixation Kit with Nose Clamp for 75-1501 Platform (for mouse only)</td>
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<tr>
<td>75-1552</td>
<td>BP adapter to DIN-8</td>
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*NOTE: At the end of the part number add EU for Europe, UK for United Kingdom and CN for China models.
Contact us for more information!