

MouseSTAT® Jr.

Pulse Oximeter for Mice and Rats

User's Guide



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This product is not designed, intended or authorized for use in human applications.

Part 1: MouseSTAT Jr. User's Guide

The MouseSTAT Jr. measures oxygen saturation (SpO₂) and heart rate up to 900bpm. It easily integrates into your anesthesia set up, and its small footprint fits in the palm of your hand. It includes a two illuminated displays that allow you to quickly view vital signs while focusing on your animal. Visual alert indicators confirm sensor placement, allowing you to identify and maintain accuracy at the sensor site.

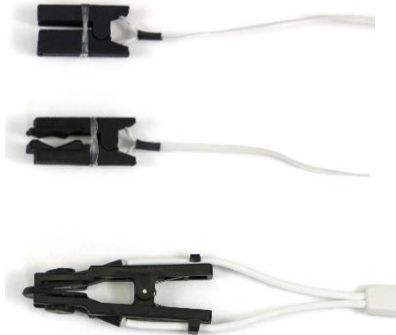
Included Equipment



MouseSTAT Jr. Controller and power supply

Sensor Options

Clip Sensors

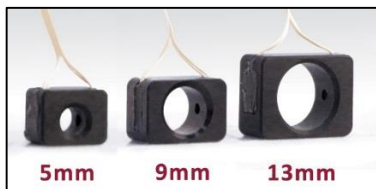


Mouse paw pulse oximeter sensor

Rat paw pulse oximeter sensor

Large animal sensor

Annular Sensors



Pup, paw, and whole body sensor

Part 2: Getting Started

System Assembly

1. Connect the power supply to the Power socket on the back of the controller.
2. Plug the pulse oximeter sensor into the MouseSTAT Jr. adapter cable.
3. Plug the sensor adapter cable into the Sensor socket.
 - a. Ensure that the red light is visible in the sensor, and the “Check Connection” indicator on the MouseSTAT Jr. Controller is not illuminated.

Instructions for Use

1. Turn on the MouseSTAT Jr. by pressing the On/Off button on the back of the controller.
2. Set the minimum heart rate.
 - a. Press and hold the On/Off button for 5 seconds. The top display will read “Hr”, and the bottom display will show a numeric value. The value represents the minimum allowed heart rate that the system will detect.
 - b. Change the value by pressing the On/Off button.

Minimum Heart Rate Recommendations

Mouse	240
Rat	120
Custom	40-500

- c. After 5 seconds of inactivity, the setting will be saved.
3. Place the sensor over the hind paw of the animal so that the red light is centered over the pad of the paw.
4. When finished, press the Power button to turn off the MouseSTAT Jr.

FAQ and Troubleshooting

This chart shows common problems you might experience with the MouseSTAT Jr. If none of the suggested solutions solve your problem, please contact Kent Scientific for assistance.

Problem	Possible Cause	Solutions
Check Connection Light or no red light in sensor	Sensor not fully connected	<ul style="list-style-type: none">• Ensure that all connections are tight, especially at the back of the controller.
	Sensor or interface cable has damaged wire	<ul style="list-style-type: none">• Replace the damaged cable
Check Placement Light or Inconsistent readings or No readings	Incorrect sensor placement	<ul style="list-style-type: none">• Reposition sensor on animal's paw
	Poor animal circulation	<ul style="list-style-type: none">• Investigate type and dose of anesthetic and other drugs; reduce if possible• Increase body temperature of animal to encourage circulation

Care and Maintenance

MouseSTAT Jr. Controller Maintenance

1. Always position the Controller away from areas of potential contamination. Should the unit become soiled, gently spot clean with a damp wipe or towel. Never use liquids directly on the Controller.

MouseSTAT Jr. Sensor Maintenance

1. MouseSTAT Jr. sensors are designed to be gentle on small paws. Avoid any practice that creates tension or strain on the sensor cable or its connections.
2. When not in use, gently coil the MouseSTAT Jr. sensor and store in its package to prevent tangles or bends in the sensor wire.
3. Gently wipe the sensor clean between uses.

Part 3: Theory of Operation

MouseSTAT Jr. and Pulse Oximetry

A pulse oximeter measures how much oxygen is carried in the blood. Oxygen saturation and pulse rate are determined by passing two wavelengths of low intensity light, one red and one infrared, through the body tissue to a photodetector. The signal strength of each light source depends on the color and thickness of the body tissue, sensor placement, and the absorption of the arterial and venous blood in the body tissue.

Oximetry processes the signals, separating out the time-invariant parameters (arterial volume and SpO₂) to identify the pulses and calculate the oxygen saturation. Simple calculations for oxygen saturation can be performed because blood saturated with oxygen predictably absorbs less red light than oxygen-depleted blood.

Since measurements of SpO₂ depend on a pulsating vascular bed, any condition that restricts blood flow, such as the use of spring-loaded Y-clip sensors, may make accurate SpO₂ and pulse rate readings impossible.¹

MouseSTAT Jr. Sensors

There are two styles of MouseSTAT Sensors: clip and annular:

- **The mouse and rat clip sensor** is used on the paw and is designed to make contact with the skin without affecting circulation. The clip hinge is not spring loaded, thus reducing the possibility of ischemia at the sensor site, and detects signals equally well on the front or rear paw. The large animal sensor is ideal for placement on the tongue, Achilles tendon, ear, toe webbing, or thigh.
- **The annular sensor** is used for pups and allows for accurate measurements without making full contact with the skin. MouseSTAT sensors are available in four sizes: 5mm, 9mm and 13mm. The size refers to the internal diameter of the hole in the center of the sensor. The MouseSTAT annular sensor does not require contact with the skin to obtain accurate measurements and is used as a whole-body sensor in neonatal rodents.

¹ Wright, B., Hellyer, P.W., Respiratory Monitoring During Anesthesia: Pulse Oximetry and Capnography. The Compendium. 1996;18:10

Sensor Placement

For best results, position the sensor in an area where there the pigment is lightest, such as the palm (metacarpal or metatarsal) region of the paw.

Clip Sensor

We recommend placing the MouseSTAT clip sensor for pulse oximetry measurements on the metacarpal or metatarsal section of the paw of adult rodents. The hind paw is optimal because less movement associated with breathing occurs there compared to the front paw. Depending on the size of the animal, the large animal sensor is ideal for placement on the tongue, Achilles tendon, ear, toe webbing, or thigh.

Whole Body (Neonatal Rodents): Annular Sensor

We recommend the annular sensor in neonatal rodents for pulse oximetry measurements around the body. Lay a portion of the pup's body through the sensor. Full skin contact is not required for measurements with the annular sensor.

Tail: Considerations Regarding Placement

We do not recommend the MouseSTAT annular sensor for pulse oximetry measurements on the tail. Significant research over the years has shown the tail of a rat or mouse to be a specialized organ under control of the CNS for the thermoregulatory control of body temperature. Warming of the subject to the point of eliciting a thermoregulatory response is required to increase blood flow through the tail and assure the most accurate SpO₂ readings. Experiments of Lemons and Wu² have shown that:

- perfusion in the tail tip is more than tenfold higher than that in the tail base
- perfusion in the middle region of the tail increases eightfold during warming compared to threefold to fourfold in the base and tip.

Our experience shows that pulse oximetry sensors placed simultaneously on a limb and the tail of non-warmed subjects such as rat pups and mice produce significant differences in signal quality. The limb, which is a smaller appendage, shows a significant pulse signal quite usable for SpO₂ detection, but the signal from the base tail is almost devoid of pulses and shows mainly a strong respiration artifact.

² Wu Y, Jiji LM, Lemons DE, Weinbaum S., Department of Mechanical Engineering, City College of the City University of New York, New York, USA. A non-uniform three-dimensional perfusion model of rat tail heat transfer. *Phys Med Biol.* 1995 May;40(5):789-806.

Part 4: General Information

Thank you for purchasing the MouseSTAT Jr. We truly appreciate your business. We strongly advise that you read and study this Owner's Manual to appreciate fully all the features, benefits, and capabilities of the MouseSTAT Jr.

Contact Information

Kent Scientific Corporation
1116 Litchfield Street
Torrington, Connecticut 06790
E-mail: sales@kentscientific.com

Toll-Free: 888-5RATTUS (888-572-8887)
Outside US: 860-626-1172
Fax: 860-626-1179
Internet: www.kentscientific.com

Disclaimer

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This product is not designed, intended or authorized for use in human applications.

Product Warranty

The MouseSTAT Jr. has a one (1) year warranty including all parts and labor charges. This warranty does not cover damage by any cause including, but not limited to, any malfunction, defect or failure caused by or resulting from unauthorized service or parts, improper maintenance, operation contrary to furnished instructions, shipping or transit accidents, modifications or repair by the user, harsh environments, misuse, neglect, abuse, accident, incorrect line voltage, fire, flood, other natural disasters, or normal wear and tear. Changes or modifications not approved by Kent Scientific Corporation could void the warranty. The foregoing is in lieu of all other expressed warranties. Kent Scientific Corporation does not assume or authorize any party to assume for it any other obligation or liability.

Satisfaction Guarantee

Should you experience difficulty with the MouseSTAT Jr., our Technical Support Group will assist you in troubleshooting and determining if the product needs to be returned to our facility. We will issue you a Return Manufacturer Authorization (RMA) number before the product is shipped back for repair. It is at the discretion of the manufacturer to replace or repair a defective part or product. Please call Customer Service at 888-572-8887 to obtain a Return Manufacturer Authorization number. Shipments without a RMA number will not be accepted. Please note that after our 30-day return policy period ends, we will be happy to assist you with your application, but cannot issue any credit or refund for a returned MouseSTAT Jr.

Prior to shipment, please clean and decontaminate the product of any chemical, biological, or isotopic contamination. Please include a completed Product Return Form with the shipment. The form can be found on page 9 of this Owner's Manual. For additional copies, call Kent Scientific Customer Service at 888-572-8887.

⇒ Product Return Form - Complete Steps 1 through 4



Kent Scientific
CORPORATION

860.626.1172 / toll-free: 888.572.8887 / fax: 860.626.1179
1116 Litchfield Street, Torrington, CT 06790 / www.kentscientific.com

1

Product Name: _____ Serial #: _____ RMA#: _____
(in subject line of email)

Product Name: _____ Serial #: _____

Product Name: _____ Serial #: _____

2

Prior to returning equipment that may be contaminated with biohazardous materials, potentially biohazardous materials, or radioactivity; the user must first decontaminate the equipment being returned. The decontamination procedure will include the following, as appropriate:

RETURNS WILL NOT BE ACCEPTED WITHOUT THIS INFORMATION

Place an "X" next to the appropriate box

This equipment has not been used in an area which would result in any biohazard or radioactive exposure.

This equipment was appropriately decontaminated* from any biohazardous materials with: _____



*Example: Autoclave, 10% bleach, Ethylene Oxide, formalin, etc. (Please note that it is the user's responsibility to confirm that the method of decontamination used is appropriate). Instruments must be decontaminated externally and internally, if needed.

This equipment was appropriately decontaminated and tested for radioactivity by: _____

*Example: Wipe test with results (³H, ¹⁴C, α-emitters), Geiger counts, etc.

3

If you are expecting a return or replacement shipped to you, please indicate the shipping address:

Institution: _____

Department: _____

Address Line 1: _____

Address Line 2: _____

City: _____ State: _____ Zip: _____

Country: _____ Telephone: _____

4

Name: (print) _____ Telephone: _____

Signature: _____ Date: _____

Return Product To: Kent Scientific Corporation
1116 Litchfield Street
Torrington, CT 06790 USA
Attn: Returns/RMA #

Returns using a Kent Scientific account should be sent "standard ground" service only. Written permission is required to use any service other than standard ground. Unless prior written authorization is obtained, the sender will be responsible for additional costs associated with the shipment if it is not sent by standard ground.

BEFORE SHIPPING THE PRODUCT: Fax or Email the completed form to 860-626-1179, sales@kentscientific.com



Kent Scientific
C O R P O R A T I O N

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sales@kentscientific.com