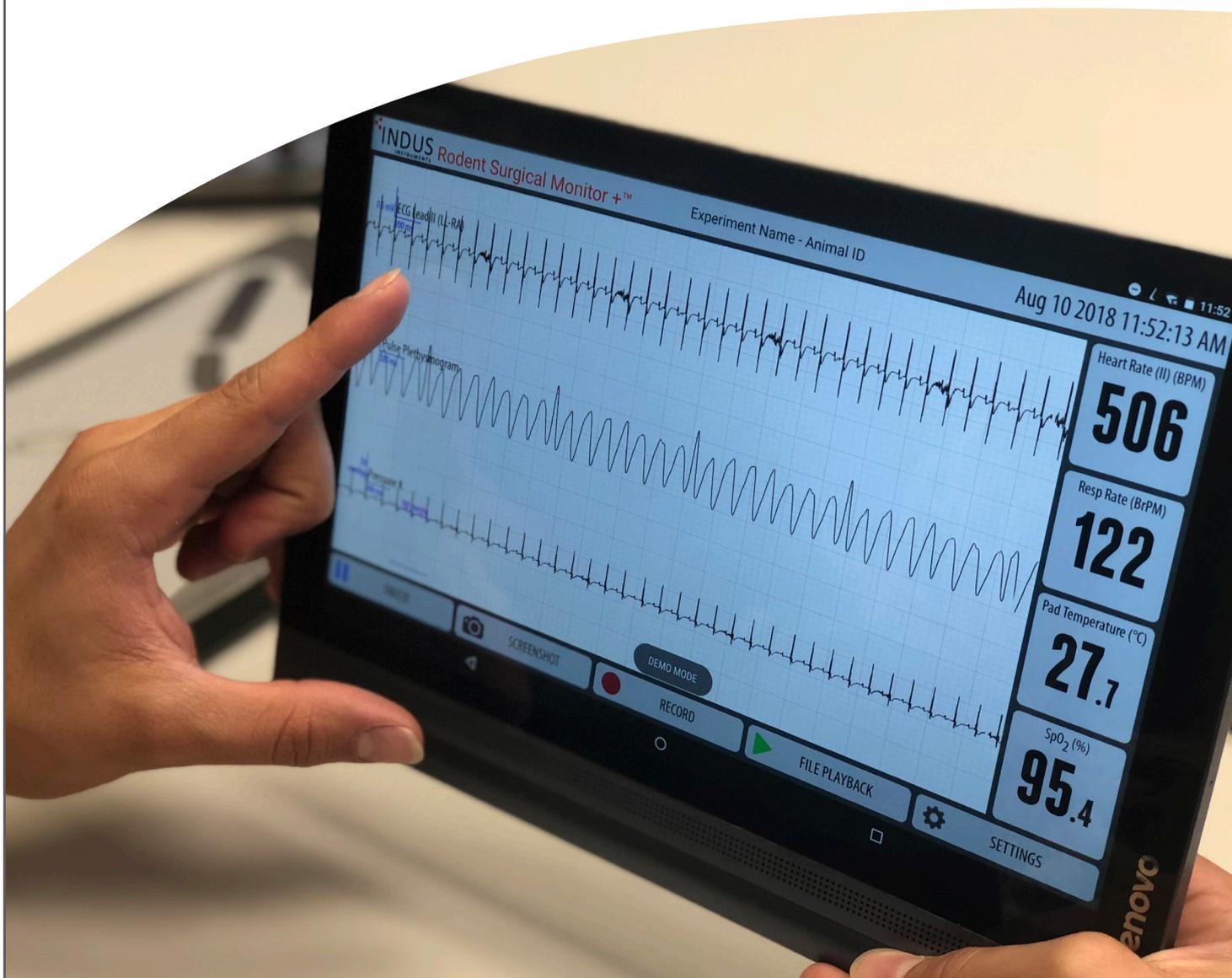


# RODENT SURGICAL MONITOR<sup>+</sup>

An advanced, integrated vital signs and surgical monitoring solution for preclinical research in mice, rats and other small animals



# A NEW WAY OF HEATING AND MONITORING...

The advancement of science and discovery in pre-clinical research laboratories has always relied on consistent and stable surgical practice. As such, a variety of technologies have become “must-haves”, enabling researchers to collect physiological signals of interest so they can monitor, diagnose and document their research. Increasing Institutional Animal Care Committee (IACUC) requirements necessitate surgical monitoring and reporting. Having a surgical monitoring system makes monitoring, record keeping and reporting simpler and increases surgical consistency and survival rates. At the foundation of this monitoring process is the ability to regulate core body temperature and to monitor heart and respiratory rate to ensure animal well-being and an appropriate plane of anaesthesia.

Looking at the complex integration of various sensors and systems, Indus Instruments set out to design a turn-key surgical monitoring platform that would satisfy essential needs for scientific research involving both simple and complex surgeries in rodent subjects.

The result is the **Indus Instruments Rodent Surgical Monitor\*** -- an integrated surgical monitoring solution for small animal research offering core body temperature measurement and regulation, ECG, respiration rate, heart rate, pressure and pulse oximetry (SpO<sub>2</sub>).

This is the future of surgical monitoring... simplified.



HEART RATE



CORE BODY



ECG



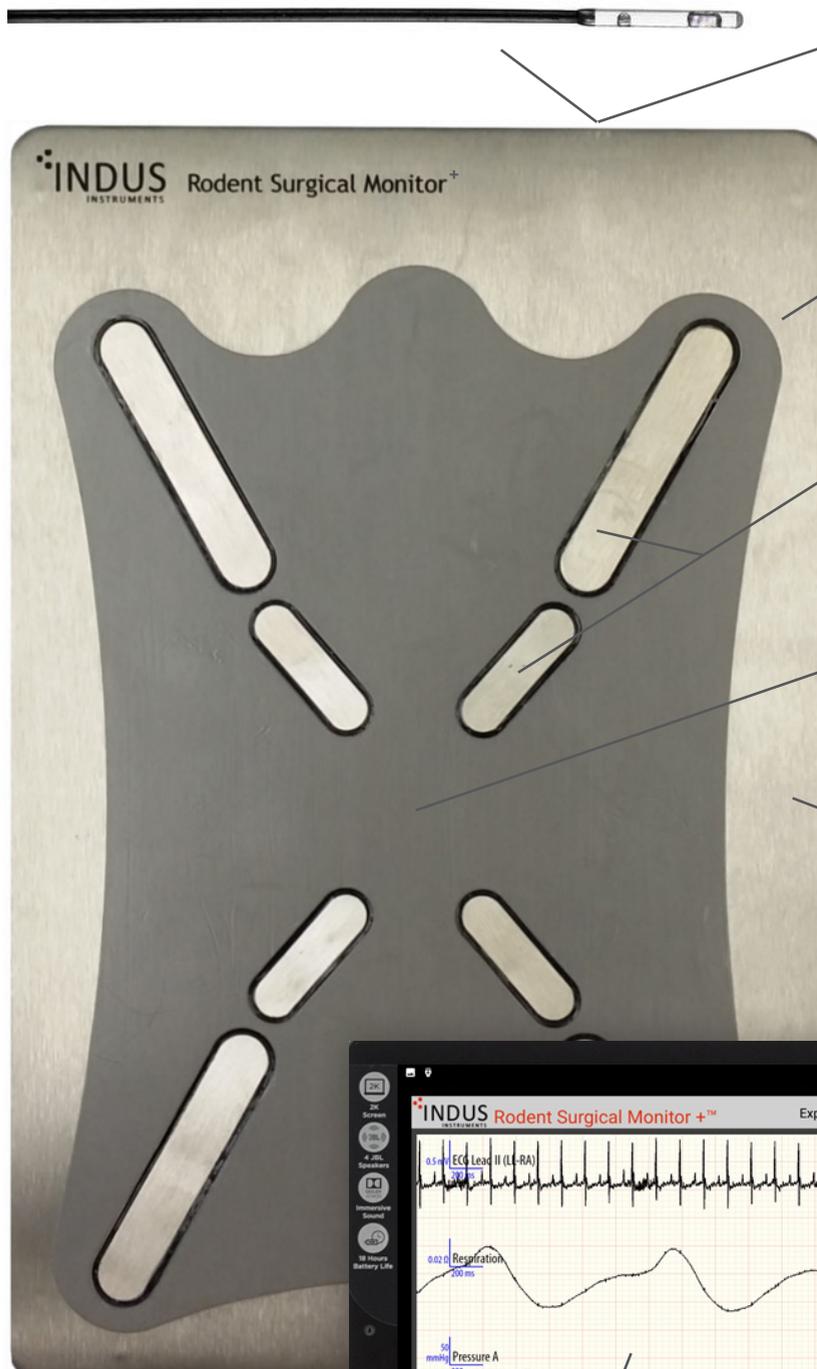
PRESSURE



RESPIRATION  
RATE



PULSE  
OXIMETRY



**Available Options:**

- Pulse Oximetry using thigh clip
- Invasive blood pressure using Indus catheter

**Work Surface:**

The stainless steel platform has a durable easy to clean surface

**Surface ECG Electrodes:**

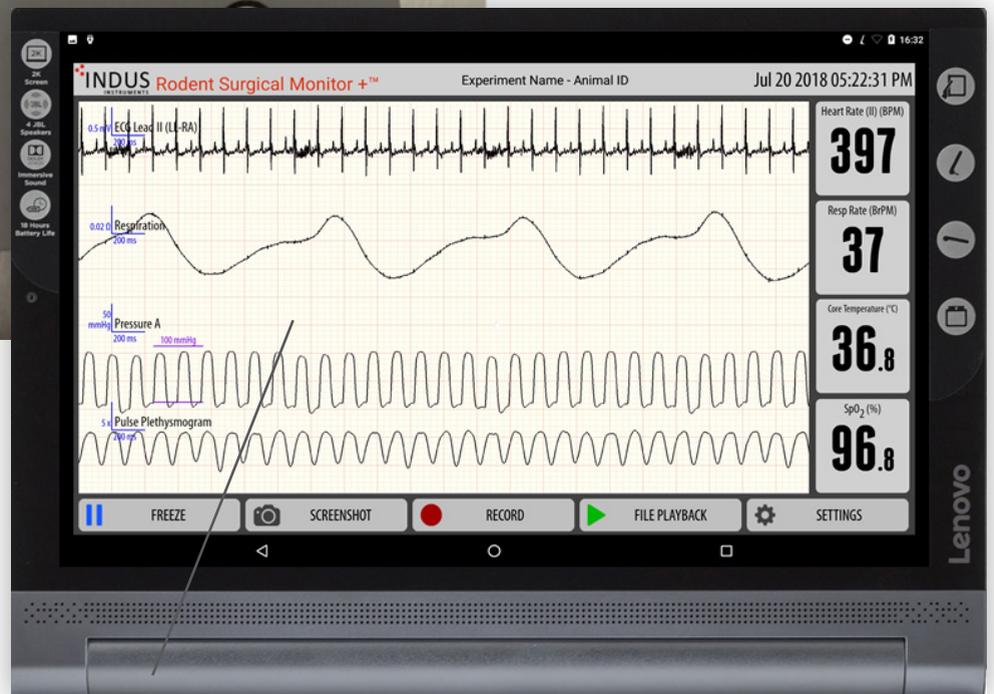
There are two sets of electrodes built into the platform surface, they are suitable for mice and rats

**Warming Zone:**

The dark grey area represents an intelligent heating zone to help maintain core body temperature

**Metal Frame:**

The aluminium frame is durable and contains threaded holes for accessory placement if needed

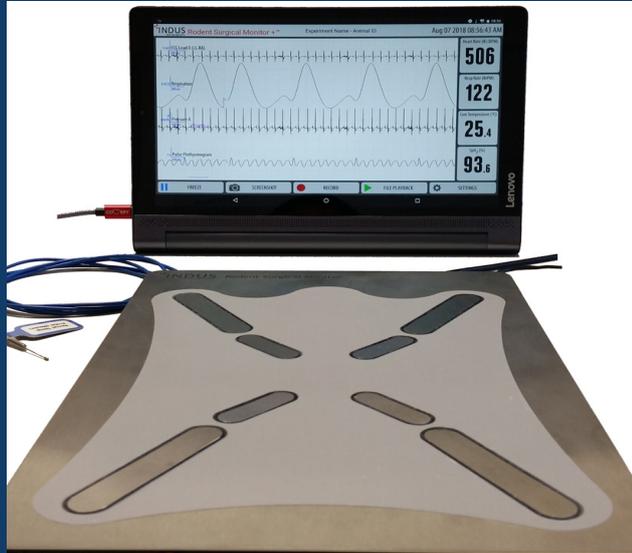


**External ECG Electrodes:**

Optional external electrodes (needle or disk) allow the user to collect an ECG signal when animals cannot be secured in a prone or supine position

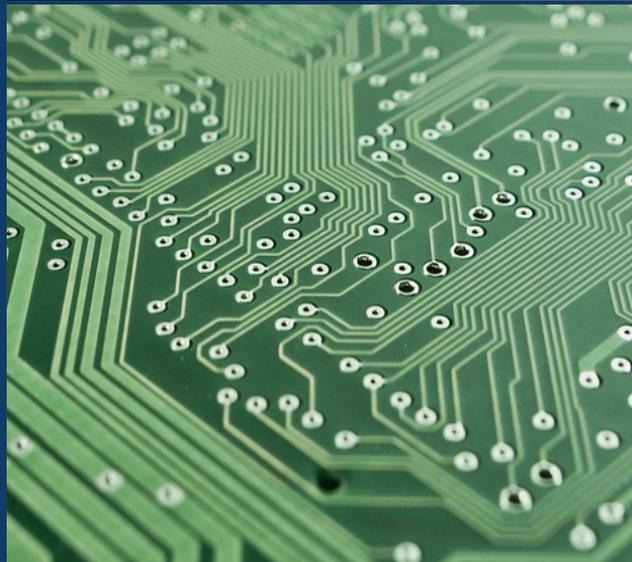
**Touch Screen Display:**

The 10" tablet connects wirelessly (wired connection available upon request) to the platform to display select waveforms and numeric data in real-time as configured by the user. The touch screen is compatible with surgical gloves. Quick menu function include Screenshot, Export Data, and File Playback capabilities



### **Optimized For Complex Surgeries:**

The Rodent Surgical Monitor+ offers the ideal operating environment for the researcher. A low profile design and a metal frame provide a clear work surface for the user with surgical accessories within close reach. External ECG leads provide flexibility for procedures that do not involve a supine or prone position, or involve a larger sized subject.



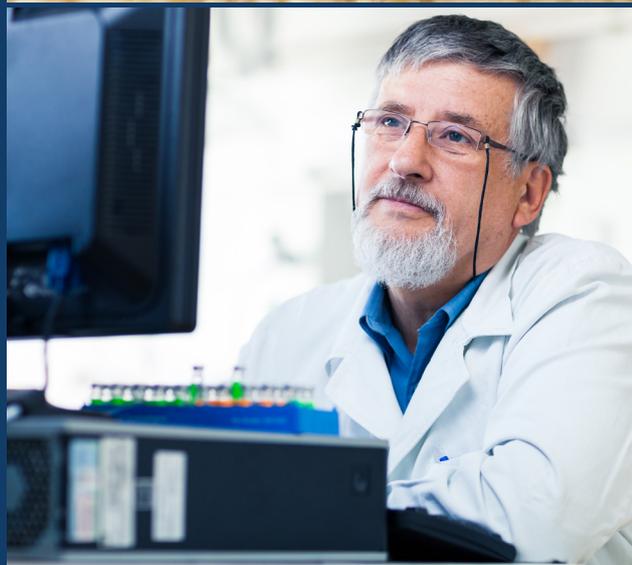
### **Signal Stability:**

Indus engineers have spent countless hours optimizing pad circuitry, hardware components and housing materials to ensure that the physiological signals measured by the Rodent Surgical Monitor+ are both accurate and stable. In addition, the unit has been optimized for signal isolation to ensure a minimal amount of cross-talk or interference with other laboratory equipment.



### **Pressure Catheter Option:**

The Pressure Catheter Option includes a software and firmware update, along with a catheter connection cable. When connected to an Indus pressure catheter, measurements of arterial and ventricular pressures can be performed. This adds another real-time continuous data stream to the Rodent Surgical Monitor+. The Indus high fidelity rodent pressure catheters are specifically designed for use with mice and rats. These catheters have solid state sensors mounted at the tip that measure



### **Data Integration:**

The data obtained with the Rodent Surgical Monitor+ is central to each study and therefore most valuable when acquired with other experimental measurements in a single data acquisition file. By combining vital signs monitoring with other measurements, researchers can interrogate data at a deeper level and better understand subtle changes both pre and post surgery.

# DO BETTER SCIENCE... FASTER

- Improve your surgical consistency, leading to better outcomes and higher throughput
- Increase your subject survival rate, reducing lab time and expenditure
- Improve IACUC compliance and GLP
- Monitor and document with ease
- Maintain stable and consistent subject body temperature leading to more reliable and accurate data
- Integrate your monitoring data with other physiological measurements through a central acquisition system

## Institutes that rely on Indus Small Animal Surgical Monitors

American Health and Medical Supply International Corporation, Anesteo, Atlanta VA Medical Center, Baylor College of Medicine, BK Ultrasound, Brigham and Women's Hospital, Bristol-Myers Squibb Company, Catholic University of Korea, Centocor Research and Development Inc., CHU Reims, Columbia University, DecImmune Therapeutics, Emory University, Englewood Hospital & Medical Center, Fujian Normal University, GE Healthcare - Life Sciences, Gilead Sciences, GlaxoSmithKline, Harvard Medical School, Hong Kong University, Imperial College London, Inselspital - Bern, INSERM, Institut Langevin, James Cook University, Johns Hopkins School of Medicine, Karolinska Institutet, King's College London, Lexicon Pharmaceuticals, Louisiana State University, Maastricht University, Macquarie University - Australian School of Advanced Medicine, Massachusetts General Hospital, Medical University of South Carolina, Merck & Co., MR Solutions, National Heart Centre Singapore, National Institutes of Health, National Tsing Hua University, Northwestern University, Novartis Institutes for Biomedical Research, Oregon Health and Science University, Oxford University, Pfizer, Pohang University of Science and Technology, Providence VA Medical Center, Purdue University, Seattle Children's Research Institute, Silver Creek Pharmaceuticals, St. Boniface Research Centre, Sunnybrook & Women's College Health Sciences Centre, SUNY - University at Buffalo, SUNY Downstate Medical Center, Temple University, Texas Heart Institute, Tulane University School of Medicine, UNC School of Medicine, University Hospital Regensburg, University of Alabama - Birmingham, University of Arizona, University of Bonn Medical Center, University of Bordeaux, University of Cambridge, University of Cyprus, University of Giessen, University of Guelph, University of Illinois - Chicago, University of Iowa, University of Kentucky, University of Lausanne, University of Louisville School of Medicine, University of Michigan, University of Mississippi Medical Center, University of Missouri School of Medicine, University of North Carolina, University of Pittsburgh, University of Puerto Rico, University of South Carolina School of Medicine, University of South Florida School of Medicine, University of Tarapaca, University of Toledo, University of Toronto, University of Tromsø, University of Washington, University of Texas Health Science Center at Houston, University of Texas Health Science Center at San Antonio, Washington University in St. Louis, West China Hospital - Sichuan University, Western University Canada, William Harvey Research Institute, Yale University School of Medicine, Yeshiva University - Albert Einstein College of Medicine

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***We at Indus believe in using our talent in medical electronics design to advance biomedical research and improve the lives of those around us.***

*Our mission is to take an idea all the way from vague concept to sound design, working through prototypes until an innovative product that exceeds the expectations of our customer is realized. Our ability to handle both design and manufacturing under one roof is what sets us apart from other operations. Whatever we design we will help manufacture.*

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