Allentown®
Improving Life – it's in our DNA.®

Home Cage Monitoring

DATA SHEET

Your trusted global partner in life-saving research

For over 50 years, Allentown has provided critical solutions to the biomedical research community. Our high-quality equipment and advanced vivarium systems continue to define and exceed industry standards. Like everything we do, our unparalleled customer service is stamped with the Allentown hallmarks of integrity, dedication and care.

Home Cage Monitoring

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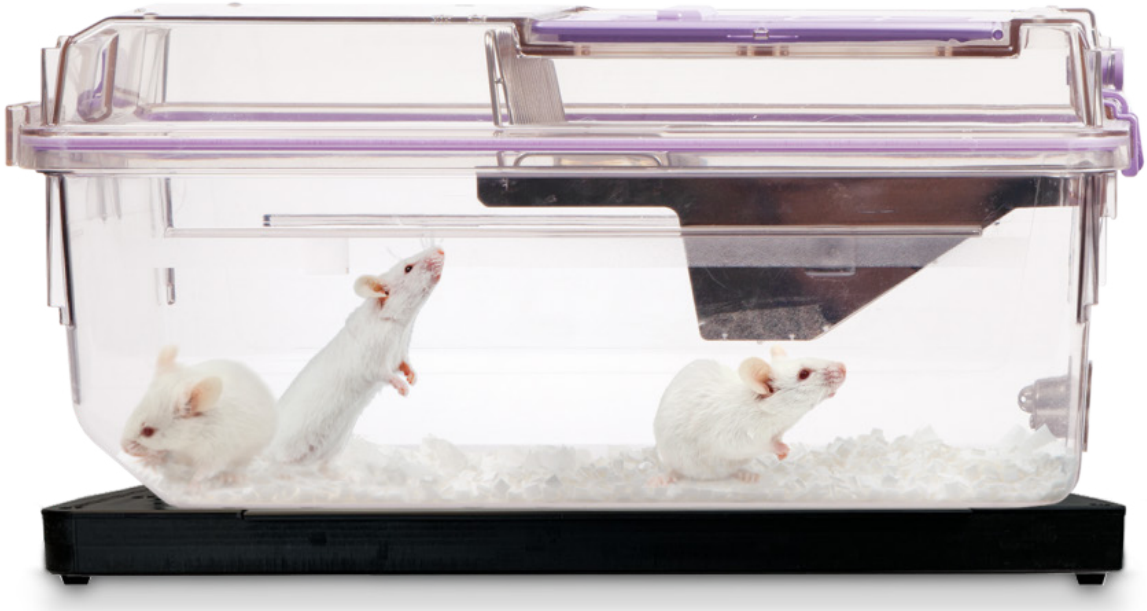
OVERVIEW

Providing critical solutions with integrity and care.



Continuous Monitoring of Digital Biomarkers in Group-housed Mice

The UID Mouse Matrix was developed to address the challenges researchers currently face when evaluating temperature and activity in socially-housed mice. This novel RFID-enabled system allows for continuous and remote monitoring of digital biomarkers, temperature and activity, for one or multiple mice in their home-cage environment.

Allentown and UID Partnership

Digital technology in the home cage is the future but in the present there has yet to be one solution that fits all research needs. There is no defined consensus among researchers on the parameters that must be monitored or how they will interpret an exponentially greater amount of data. Nor do they know exactly what their budget will allow them to pursue. Current solutions require a very large per-cage-slot investment with little flexibility, a tremendous learning curve and very little practical results. During this exciting phase of solution evolution Allentown and UID provide a practical approach – a proven home cage monitoring solution in a scalable framework to fit all needs and budgets.

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OVERVIEW – HOW IT WORKS

Benefits – Video-based systems allow researchers to leave the room and monitor the animals remotely, but this practice is not only costly, but also time- and labor-intensive since it relies on research staff fully dedicated to video interpretation – which also introduces experimenter bias. Temperature is another important biomarker for evaluating animal health and welfare. However, conventional temperature recording methods require frequent handling and the use of intrusive devices (i.e., rectal probes) that are stressful to the animals. Furthermore, it is difficult to accurately monitor animals without disturbance, in a group-housed setting, or at night when they are most active.

The system can monitor group-housed mice in a completely undisturbed setting – Valuable research data can be collected automatically in real-time (24/7), even during inactivity phases. In addition to removing experimenter bias, the UID Mouse Matrix can help improve study outcomes by permitting frequent and accurate measurements of progressive behavioral and physiological changes over time in the same animal.

Integration of UID Mouse Matrix Technology with Allentown's state-of-the-art rodent housing systems enables high throughput data collection and remote monitoring capabilities from high-density IVC rack systems.

The UID Mouse Matrix enables automatic, continuous, and remote monitoring of temperature and activity for group-housed mice while in their home-cage environment and without researcher interference.

1. Insert Microchip

Simply insert the miniature microchip in the animals, and place them back in their cage. The UID Temperature-sensing microchip provides mouse tracking capabilities and reliable temperature measurements with unmatched accuracy to ±0.1 °C.

2. Place Matrix

Dock cage in a UID-enabled Allentown IVC rack for continuous (24/7) and undisturbed tracking of the animals' temperature and activity. The Matrix reader actively polls its antennae (plate zones) to scan the cage for the presence of any microchip within range. Once detected, the microchip activates and sends relevant data (Animal ID, Temperature, Location, Time/Date) to the data collection software. Zone transitioning is done in rapid succession with timing adjusted by the user's specifications.

3. Collect Data

The UID Matrix Software collects and records the data from the Matrix system(s) as often as every 200 milliseconds. The program automatically captures physiological and behavioral biomarkers in real-time (24/7), and these data can be accessed remotely or stored for further analysis.

Remote and Continuous Monitoring

- Undisturbed rodent behavior
- Evaluation of physiological and behavioral biomarkers
- Accurate measurement of progressive behavioral changes

Automated Data Collection

- Reduce errors inherent in manual data entry
- Eliminate experimenter bias
- Increase accuracy, reproducibility and objectivity

Enhanced Animal Welfare

- Reduce animal handling and stress
- Non-invasive temperature monitoring
- Undisturbed monitoring of mouse activity
- Alerts for critical health indicators

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OVERVIEW

UID-Enabled Allentown IVC

Benefits

- Real-time monitoring of digital biomarkers (Temperature and activity)
- Remote monitoring of group-housed mice over long periods
- Accurate tracking of individual animals within a group
- Evaluate rodent social interactions and home-cage behavior without human interference
- Objective monitoring of animal behavior during inactivity phases
- Detect early disease onset and measure disease progression non-invasively
- Accurate measurement of progressive behavioral changes in the same animal
- Improve animal welfare by reducing animal handling and stress

Features

- High frequency readout – multiple antennas capture and report data as fast as every 100 milliseconds
- Eight-zone reader plate configuration
- Stand alone system or networked for multiple cages on a rack
- Immediate access to data or exported to excel for further analysis
- Intuitive software for enhanced user experience
- Alerts for critical indicators or animal health and welfare
- Real-time census for all individual animals
- Single waterproof connection for power and communication

Home Cage Monitoring

COMPONENTS

Temperature Programmable Microchip

- Miniature RFID transponder with integrated temperature biosensor
- Temperature accuracy: ±0.1 °C @ 38 °C
- Optimal temperature read range: 25 °C – 50 °C

Mouse Matrix Reader Plate

- 8-zone configuration
- Thin profile to maximize cage density
- Compatible with static cages and select cage-rack systems

Mouse Matrix Controller

- PC w/ SQL Express
- Up to 10G data storage

PoE Switch

- 24-port switch, plus all cables
- Power and communication for up to 24 plates
- Multiple devices can be used

Mouse Matrix Software

- Intuitive program provides basic data graphing and analysis
- Real-time access to data, and exported to Excel for further analysis
- Server/client edition

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