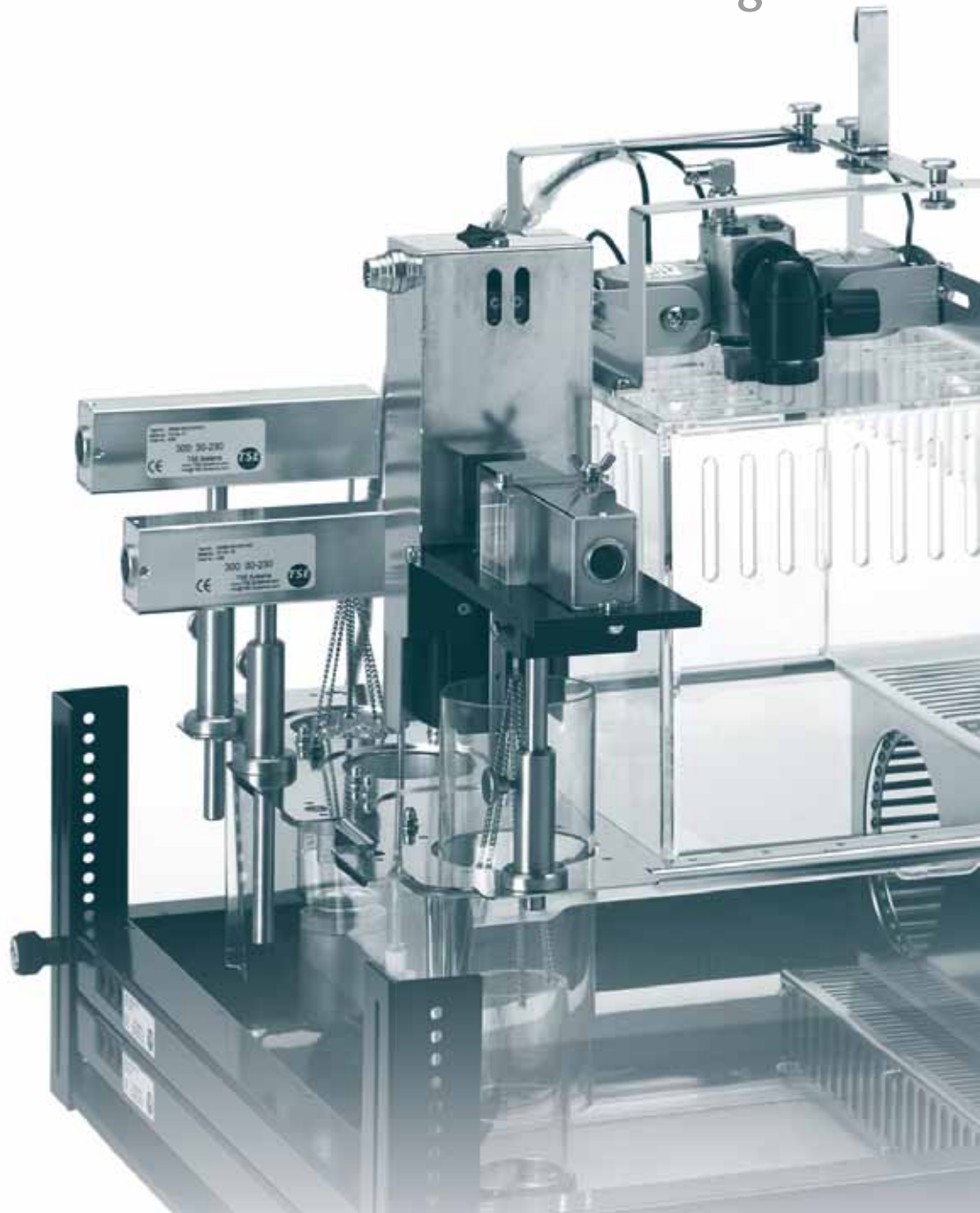


Sophisticated Life Science Research Instrumentation



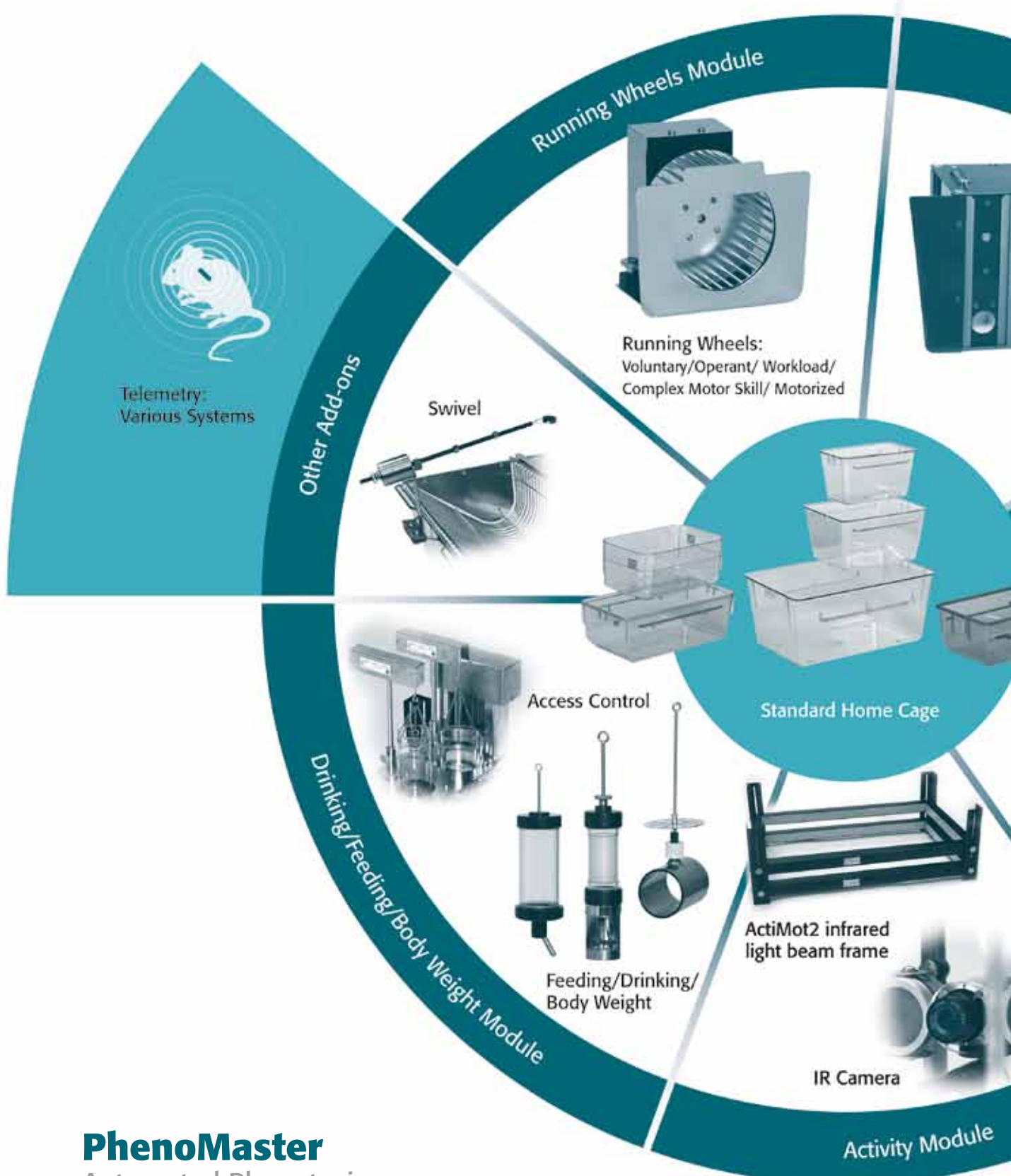
PhenoMaster

Integrated Behavior & Metabolism Monitoring



Automated Phenotyping: New Horizons

www.TSE-Systems.com



PhenoMaster

Automated Phenotyping



Operant Learning Module



Operant Wall



AnimalGate

For detailed information, please see separate brochure
www.PhenomWorld.com
PhenomWorld
Multi-Arena System

Calorimetry Module



CaloSys indirect calorimetry



Exercise CaloWheels



CaloTreadmill

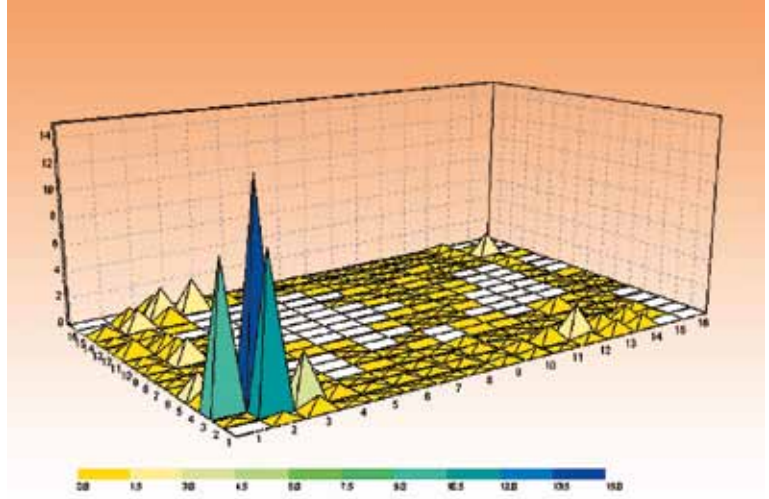
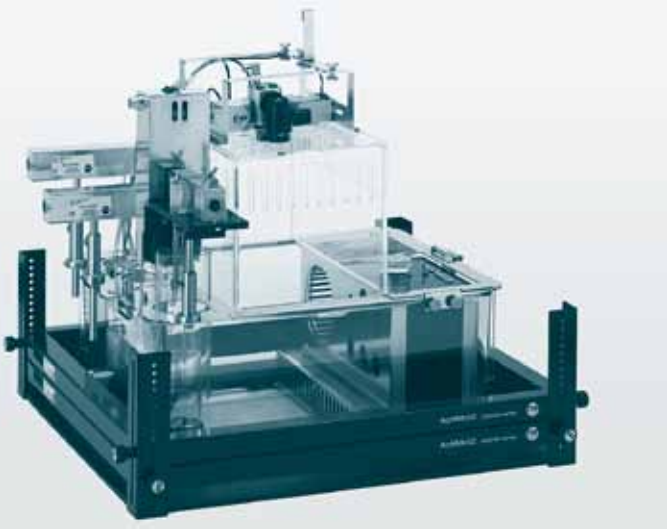


Metabolic PhenoCage



PhenoMaster
Automated Phenotyping





Hardware: Integrated Modules

The TSE Systems PhenoMaster is a comprehensive modular platform for automated behavioral and metabolic phenotyping of rodents

YOUR BENEFITS

- **High-throughput, long-term data: in-depth analysis**
- **Home cage measurement: enhanced animal welfare and natural behavior**
- **Expandable modular system: growing with your needs**
- **Minimum experimenter interference: unbiased data**
- **Enhanced data accuracy**
- **Numerous experimental set-ups possible: all-in-one system**
- **High-precision calorimetry**
- **2-year ALL-IN Warranty**
- **Expandable to multi-arena PhenoWorld**
- **Sturdy construction**

Home Cage Measurement

- Based on standard cage sizes
- Short animal habituation
- 24/7 monitoring: long-term measurement without experimenter interference. Continuous data acquisition
- Easy maintenance and cleaning
- Multiple analysis modules
- Stress-reduced, enriched environment
- Continuous data acquisition

Drinking/Feeding & Body Weight Monitoring

- High precision sensors in the cage lid
- Up to 6 sensors (depending on cage size) can be mounted: food choice/ diets & addiction experiments possible
- Access control module for deprivation or paired/yoked feeding experiments
- Efficient spillage protection

Activity Monitoring

- Multi-purpose three-dimensional activity measurement by infrared light-beam frame (ActiMot2) with high time and spatial resolution
- ActiMot2 also usable for temporary paradigms such as open field, light/dark, hole board experiments
- Running Wheel activity module: enables measurement of voluntary activity, rotational direction, time & distance control, complex motor skills, workload control experiments

Metabolic Analysis

- Push or pull respirometry
- Indirect calorimetry in the CaloSys module: energy expenditure using optional high-speed gas sensors
- Dedicated metabolic PhenoCages for urine and feces separation and quantification, combinable with drinking/feeding sensors and activity monitoring
- CaloWheel and CaloTreadmill allow exercise calorimetry studies

Operant Conditioning

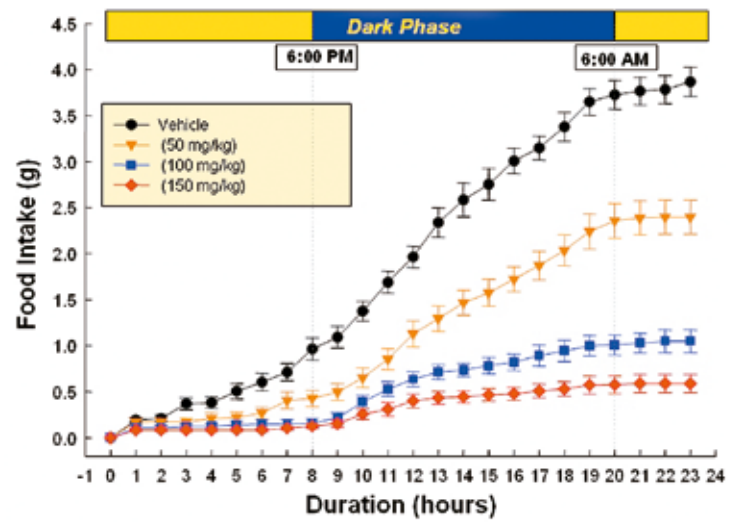
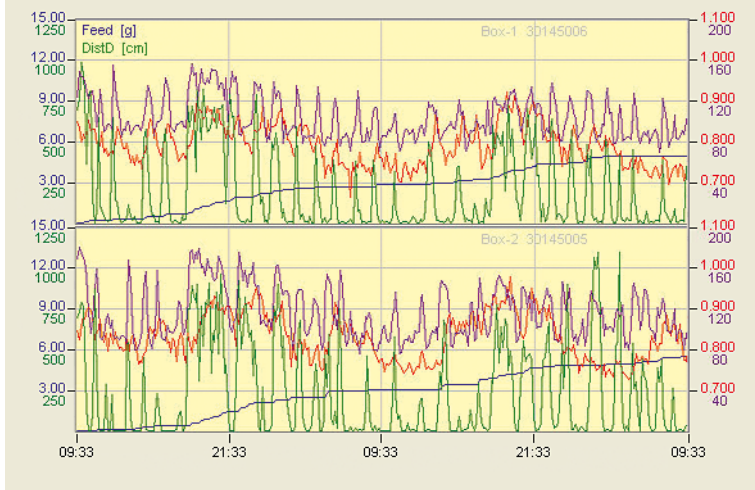
- Versatile operant learning module
- Modular wall design
- Interactive control of other home cage modules such as food access or running wheel as reward

LITERATURE EXAMPLE

Obesity Research

Fischer et al., Nature 2009

J. Fischer and colleagues identified the function of the human FTO gene in energy homeostasis by long-term measurement of indirect calorimetry and physical activity parameters of *Fto*-deficient mice in the CaloSys and ActiMot2 modules of the PhenoMaster.



Software: Design & Control at Your Fingertips

The TSE Systems PhenoMaster comes with a modular, flexible software platform

General Features

- Integrates and synchronizes information from all hardware modules
- Practically unlimited number of cages supported
- Raw data storage
- Open for customized modular extension, for example optogenetics
- Individual animal or user-specified group analysis possible
- Parameter-specific analyses and displays

Experimental Design

- Comprehensive set-up menu
- User-specified limits, for example refractory period for activity monitoring
- Programming of i.e. time- and/or consumption controlled food access
- Easy setup of long-term or repeat monitoring

In-Process Control

- Full experimental control
- Constant supervision of ongoing experiments
- In-process values and graphics available
- Immediate response and experimental alterations possible
- Event markers may be placed during a running experiment

Data Analysis & Export

- Filtering of experimental data
- Useful statistical tools implemented for immediate analysis
- Export formats supporting leading statistics programs

Module-specific Features

- Activity measurement differentiates ambulatory and fine movements
- Optional exclusion of repetitive movements such as tail flicks
- Activity frame: separate areas individually definable
- Parameters from different modules combinable in graphs
- Calorimetry module constantly monitored for air quality and flow uniformity
- Programmable remote alarm unit available for calorimetry module – direct message to phone when preselected limits are violated

YOUR BENEFITS

- Flexibility in experimental design, control and analysis
- All major statistics packages supported
- Individual and grouped analyses
- Data from all modules combinable
- Full design and in-process control
- Highly user-friendly system
- Minimum user service: remote maintenance option

LITERATURE EXAMPLE

Stress Research

Kuperman et al., PNAS 2009

The research group from the Weizman Institute analysed the neuroendocrine response to stress overexpressing the dox-inducible response mediator Urocortin in mice. Calorimetry, feeding/drinking and locomotor activity were studied with the PhenoMaster system.

International Projects

TSE Systems is proud to have been chosen as the SME partner in a number of internationally funded projects.



PhenoScale (2009-2012)

This project targets the high-throughput, standardized characterization of wild type, mutant and transgenic mouse strains, developing hardware and SOPs in the process.

www.phenoscale.com



RATstream™ (2007-2010)

During the duration of this project, the automated high-throughput phenotypical characterization of rat models for neurodegenerative and psychiatric diseases has been achieved.

www.ratstream.eu

Specifications subject to change without notice



TSE Systems 24h Service

TSE Systems offers an outstanding, global 24/7 premium customer service. Our experienced experts are dedicated to complete customer satisfaction and will solve your problem by e-mail, phone or an on-site visit.

www.TSE-Systems.com

Info@TSE-Systems.com

