i4S CAGE

Preclinical animal testing device and technology

www.i4scage.com

i4s CAGE for laboratory rats

The **i4s CAGE** is a new, AI-based, interactive preclinical animal testing tool and technology that, through its sensors - such as input fluids, nutrients, drug compounds, urine - enables more accurate examinations than ever before.

The unique features of i4s CAGE are:

- Interactive, controllable, programmable
- 24/7 monitoring without the presence of researchers
- Automated task execution
- Night vision camera, webcam
- Artificial intelligence
- Chat

Interactive

Teachable artificial intelligence enables remote control, feeding, watering, and medication dispensing, which replaces previously manually conducted research.

24/7 data collection

The observed animal's physiological signals are continuously interpreted and classified 24/7 without the presence of researchers.

Chat

As a unique solution, it communicates with researchers through chat, simplifying the extraction of current information.

Night vision camera

Built-in night vision camera allows for analysis of animal behavior at night.
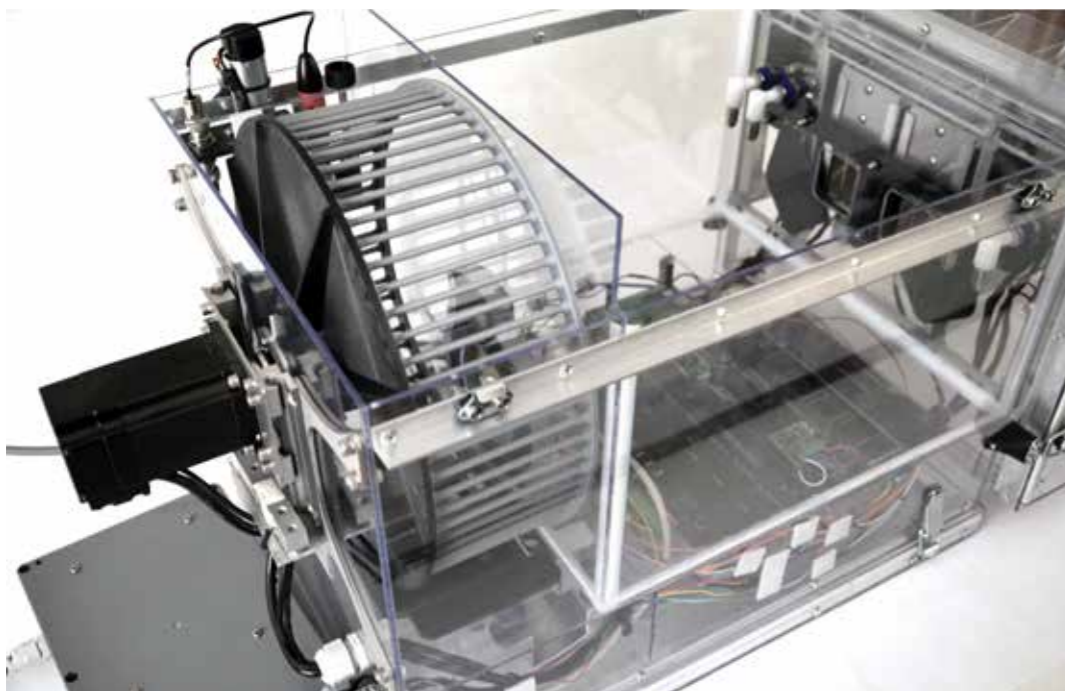
i4s CAGE provides innovative solutions in various areas of researchs:

Minimal human intervention, fully automated task performance

Combines the need for movement and resting position analysis of animals

Capable of remotely controlling the animal's free and forced movement

By applying and integrating multiple sensors, it can interpret parallel observed values compared to existing units on the market

Using its algorithm, it is capable of making recommendations for response actions (such as regulated changes in movement, nutrient, fluid, and active substance dosing)

The device operates in a constant 24/7 mode, controlled by artificial intelligence, allowing for the observation of different animal behaviors at different times of the day

A complex picture of the state of animals' circulatory system

Treadmill

Treadmills placed in cages provide an opportunity to observe both leisure and forced types of exercise. The forced exercise form occurs in electronically motorized treadmills that can be valve-like closed, and the intensity and duration of running can be controlled.

Switching between leisure and forced types of exercise promotes the analysis of sport physiological and cardiological parameters. The adaptation of the cardiovascular system shows differences in various forms of exercise. By choosing the type of exercise and using detectors that sense exhaled air, a complex image of the state of the circulatory system can be obtained. Using sensors that examine body weight, water and nutrient consumption, a linear correlation can be established in the daily fluctuation of metabolic values.

Markers

Our solution not only includes the collection of basic data such as nutrient and water consumption, temperature, oxygen, carbon dioxide, distance traveled, and speed, but also additional sensors such as urine markers and drug dosage measurement.

In addition to recording the distance and intensity of running, treadmills also record the daily distribution of time spent on exercise. A urine analyzer is attached to the platform under the treadmill, which can also be found in other areas of the cage.

The urine sensors in the area outside the treadmill can be analyzed for toxicology by recording the daily quantity and quality of urine, while changes in exercise and urine excretion can be correlated using sensors under the treadmill.

Temperature sensor

Detecting and monitoring the appropriate body temperature is critical during laboratory analyses, and is important for accurate readings of vital signs such as blood pressure and pulse rate. Built-in heat sensors allow for tracking the behavioral patterns of animals.

Sensors

Sensors for registering the behavior of test animals
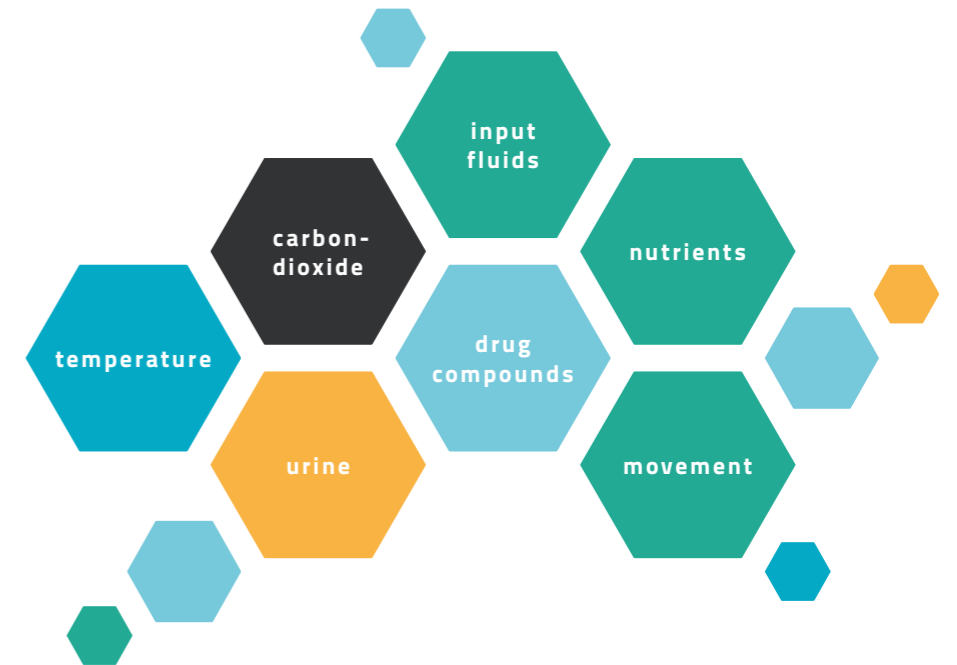
i4s CAGE software > i4s.tech

The **i4s CAGE** is powered by a unique and user-friendly software package. It's designer interface enables programming of unique experimental designs, where the entire testing process can be planned.

Dashboard

User settings options:
- add new users
- manage existing users
- assign user permissions
- manage existing permissions

By creating an IoT-ready sensor data collection platform, behavior analysis based on complex physiological measurements, trends, and patterns of physiological changes can be established. The recorded data can be easily extracted and exported, and customized data charts assist in more accurate measurements. The software can run on any laptop or computer, while the system's background services run on a server and are accessible via a web interface and mobile devices.

Analysis options are available through the tool menu

- **Units of measurement**: It is possible to set the type of unit of measurement for the test results.
- **Laboratory**: The location of the performed and currently running research programs.
- **Test subject type**: The type of animal being tested can be specified under the test subject type, which means that the resulting event log will contain all data in this direction.
- **Cage controller**: The mechanical control devices of the cage can be managed from here.
- **Cage data collector**: The unified platform for collecting data from sensors in the cage.
- **Test animal**: Provides the possibility of unique identification of individual animals.
- **Research status**: Here you can view the current status of the research process and the data related to the research.

- **Cage**: The cage menu is used to manage the basic data of the cage.
- **Cage type**: Provides categorization of cage types issued by the manufacturer.
- **Research operation**: In this menu, predefined elementary operations and their parameters can be set.
- **Documents**: The system provides the possibility of storing research documents.
- **Research doc group**: In this menu, it is possible to manage the materials used in the research.
- **Research doc type**: Provides the typization of individual materials.
- **Control types**: Control types ensure the typization of the control units of the cage.
- **Data collector types**: The use of data collector types ensures later typized data analysis.

Full support and low maintenance costs

We are committed to supporting research stability, which is why we provide customer service and full support for our product and chat service. We help optimize workflows and eliminate unnecessary work.

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