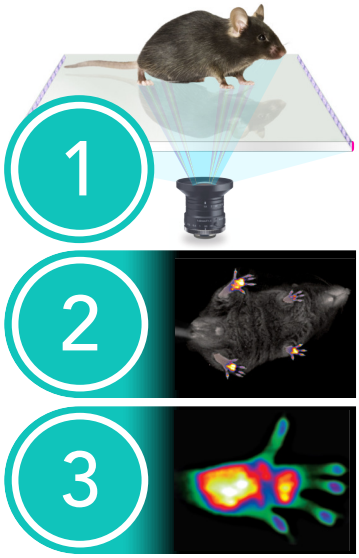
HARDWARE & DATA ACQUISITION CONCEPT

Nocturnal prey animals, such as mice and rats, innately hide signs of injury, impairment or disease from the viewpoint of predators (i.e., from above) and the behavioral repertoir of lab rodents is further constrained by the brightly lit environment of laboratories. But when recorded from below, in a dark and observer-free environment, a new world of behavioral features and nervous system readouts emerge.



HOW IT WORKS

❶ Rodents roam freely inside an opaque black chamber in apparent darkness, while recorded from below using a near-infrared (NIR) enhanced HD machine vision camera. ❷ The animal's body pose (shown at right in grayscale) is captured with a rapid pulse of NIR light, while the plantar contact areas and weight distribution of the paws are recorded seprately with our proprietary Optitouch™ sensor (colorized heatmap shown in ❸). These data streams are combined to generate a high-speed, high-resolution video ethogram of mice and rats, revealing novel behaviors that can be automatically scored and with high sensitivity to investigational interventions.



PRODUCT OVERVIEW

SOFTWARE

Our Palmreader software platform™ is a data management, analysis and visualization tool that provides access to cutting edge machine learning algorithms to automate measurement of rodent paw luminance ratios (representing relative weight borne on and within each paw), body pose estimation, supervised (human scored) and unsupervised (autonomously identified) behaviors. With our user-trainable scoring software feature, you can now automate analysis of essentially any human-observable behavior, providing consistency in scoring and saving countless hours previously spent manually counting and characterizing behavior. Moreover, our platform enables analysis of Blackbox data with virtually any open-source analytic approach designed for keypoint data, ensuring that you'll always have access to the latest published research methods.

Since 2022, over 100 of our systems have been deployed at academic institutions and pharmaceutical companies worldwide, building a global network of users eager to push the limits of what machine learning can do in preclinical neuroscience.

HARDWARE SPECIFICATIONS

Dimensions: 17.5" (443mm) W x 20.0" (510 mm) D x 36" (915 mm) H
Weight: 72lbs / 32.6 kg
Power Input: 100V - 240V AC, 50-60Hz, 1.6A-0.8A (single input)
Power Output: 15V DC, 4.8A (single output)
Compliance Certifications: RoHS, TUVRheinland, NRTL, VI, CЄ

ANALYTICS SUMMARY

4 Individual Analysis Modules

Posture Analysis
- Pose Estimation
- Body Part Distances
- Joint Angles
- Toe Spread

Gait Analysis
- Duty Factors
- Temporal Symmetry
- Limb Phase
- Stride Length
- Step Width
- Spatial Symmetry
- Velocity
- Dorsal Step Detection

Weight Bearing
- Left vs Right
- Forepaws vs Hindpaws
- Paw Area

Auto-Scored Behaviors
- Grooming
- Licking
- Scratching
- Locomotion (with turning)
- Rearing

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2026 PRODUCT LINE

BLACKBOX ONE

The Standard for In Vivo Behavior



The Blackbox One is our original rodent imaging instrument for high fidelity streamlined data acquisition. It can capture body video and paw print data for a single mouse or rat in a 30cm x 30cm open field. An optional 4-chamber setup for the Blackbox One captures both data streams in four mice simultaneously, allowing 4x throughput. Each system comes with a high performance workstation with over 30TB of local storage, and the Palmreader software suite. For high volume experimentation, up to 4 blackboxes can be used with one workstation.

BLACKBOX TWO

The Most Advanced In Vivo Platform Ever



New for 2026, the Blackbox Two has been totally redesigned to enable a range of new capabilities. In addition to all features of the Blackbox One, it features a 40x40cm recording area with improved sensitivity. Another new feature available is our 3D Module that uses 4 additional cameras to produce views from the bottom and all 4 lateral sides of the subject simultaneously. This enables automated evaluation of facial expressions, forelimb monitoring, and creation of 3 dimensional reconstruction of the kinematics of rodents within our Palmreader software suite.

Applications

Pain
- Inflammatory Pain
- Neuropathic Pain
- Visceral Pain
- Back Pain
- Facial Grimace (Q4 2026)

Orthopedics
- Limb Fracture Recovery
- Rotator Cuff Injury
- Arthritis

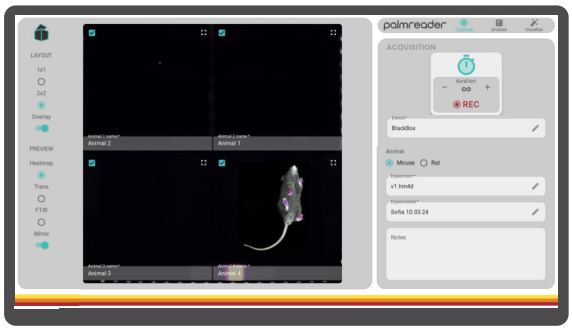
Neurodegenerative
- Parkinsons Disease
- ALS
- Memory/Cognition
- Huntington's Disease

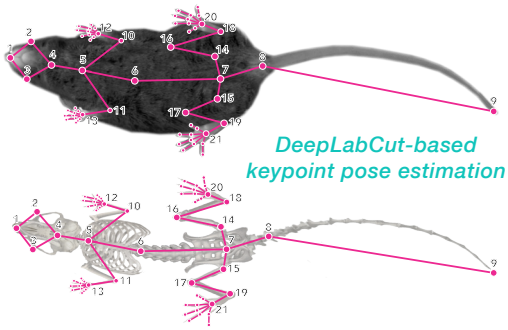
Muscle Disorders
- SMA
- Muscular Dystrophy

Social Interaction
- Autism
- Novel Object Recognition
- Depression

Spinal Cord Injury
- Basso Mouse Scale (BMS): 0-9

palmreader™ SOFTWARE PLATFORM





DeepLabCut-based keypoint pose estimation

Our Palmreader™ software is a user-friendly platform for instrument control and data acquisition, analysis and visualization. It provides easy access to your locally or cloud-stored data and enables combining of data from multiple experimental sessions, editing of analysis workflows and creation of data visualizations without programming skills.

Features include:
- Perform supervised and unsupervised ML analysis of your datasets with ease
- Annotate and organise datasets by project and user
- Analyze data with built-in suite of statistical tools
- Creation of video visualizations of your data
- Securely store and share your data
- Control experimental acquisition parameters with ease
- Training module permits users to define any behavior of interest, then automate its scoring

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