Fear Conditioning System
New Illuminator for Better Lighting and Ease of Use

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Enhance your behavioral studies with our innovative, all-in-one lighting solution. The new illuminator offers superior IR/visible lighting homogeneity and effortless cage auto-centering.

1. **Superior light homogeneity**, both IR and visible.

2. **Auto-centering made easy with Mouse XL and Rat Cage**: the new illuminator simplifies cage centering under the camera, speeding up experiment setup activities and video tracking software configuration, as well as repositioning after replacing the animal for a new experiment.

3. **No tools needed to adjust camera focus**: the lenses are held in place by a special technique that makes screwing a little harder, maintaining the focus position without the need to fix it. Lens changes are still possible.

4. **New guiding system for tethered animals**: the cable is now guided by a transparent tube, to simplify the cable insertion. A black cap is provided when the system is used to test non-tethered animals.

5. **Optional swivel holder available**: we customize the holder according to the design of your swivel.

6. **All-in-one assembly** for better service and easy replacement during maintenance activities.

Background

Freezing

- Fear conditioning is one of the most common methods to measure memory in rodents.

- It exploits the Pavlovian association between an unpleasant unconditioned stimulus (shock) to a conditioned neutral stimulus (sound cue or context).

- The reaction of rodents is to freeze when exposed to fearful situations, such as a shock.

- The ratio between the freezing with and without shock gives a measure of the memorization of the event and hence allows for a fast memory screening.

Typical device applications

Once the association has happened and the animal has memorized it, freezing will happen also when the sound is presented without shock or when the animal experiences the context where the shock was delivered.

This is the basic principle of Fear Conditioned, which is normally referred to as Cued and Contextual to describe change in the cage interior (context, or appearance).

This step of the experiment ensures that the detected freezing is actually the reaction to the sound and not to the memory of the environment.

In the same way, the memorization of the context as the unconditioned stimulus (with no sound used), can be measured by comparing the freezing with shock (training), or in the same context without shock.

Product Description

The Ugo Basile Fear Conditioning system is composed of an solation cubicle, including all electronics, fan, IR/VIS lights, camera (up to 16 cubicles can be connected to 1 PC) and seamless set-up with just 1 USB cable per cage connected to the PC. The system must be completed by choosing:

- Animal cage (one for each cubicle) available in different dimensions for rats and mice, plus the observational learning version to allow two animals to see each other (social fear conditioning). The standard cage has a circular opening, but also a vertical door is available.

- The XL cage is suggested for easier positioning in association with the new IR/VIS illumination system
- All cages are designed for cabled animals for optogenetics, electrophysiology, microphotometry, etc.
- Video-tracking system is required. Only 1 license, no matter how many cages you have.
- Optional Electric Shock Meter for Fear Conditioning system (essential instrument to measure current among cages).
- Optional UB Care 12 or UB Care 24 additional warranty extension.

Animal cages are available in different dimensions for rats and mice, plus the observational learning version to allow two animals to see each other. Each cage includes interchangeable contexts, easy to mount on the walls with different patterns, and floor.

Features	Benefits
NEW ILLUMINATOR	Improved light homogeneity, auto-centering, lens focus with no tool needed, easier pass-through for cabled animals, swivel holder (based on your specific swivel) and all in 1 assembly for easy replacement or service
One USB cable connection	Seamless installation and connection to PC
High throughput	Expandable from 1 to 16 units for high throughput
Miniaturized USB-IR camera with 2 lenses (normal and fish-eye)	Camera mounted on the ceiling and working in any light conditioning and with any cage dimension
Control via ANY-maze or any other software	Super easy to control and fully automated via to perform effortless experiments. Automated Freezing detection and controls for the most accurate results
Interchangeable contexts	Easy to mount on the walls with different patterns
IR and visible illumination	Experiments can be run in light or darkness, also as a tool to alter the context
Same software controls devices and analyses freezing	Fast learning curve in building protocols and automatic detection of freezing
Cages compatible with tethered animals	Ready for optogenetics, electrophysiology, microscopy
Multiple cage dimensions and types	Most suitable dimensions for rats or mice, observational cage for Social Fear Conditioning and Operant Fear Conditioning for conflict-based and operant tasks in Fear Conditioning.
All electronics in the cubicle	Simple and cheap upgrade to STARTLE /PPI

Main references

- Molla et al., 2024 Late-adolescent onset of prefrontal endocannabinoid control of hippocampal and amygdalar inputs and its impact on trace-fear conditioning behavior, *Neuropsychopharmacology*
- Speidell at al., 2024, Accelerated neurodegeneration of basal forebrain cholinergic neurons in HIV-1 gp120 transgenic mice: Critical role of the p75 neurotrophin receptor, *Brain, Behavior, and Immunity*
- Pietrzak et al., 2023, The Effect of Zonisamide and Ethanol on Various Types of Memory in Rats, *Int. J. Environ. Res. Public Health*
- Wang et al., 2022, Insular cortical circuits as an executive gateway to decipher threat or extinction memory via distinct subcortical pathways, *Nature Communications*
- Marszalek-Grabska et al., 2022, Unexpected content of kynurenine in mother's milk and infant formulas, *Scientific Reports*
- Jiang et al., 2020 Amyloid precursor protein intracellular domain-dependent regulation of FOXO3a inhibits adult hippocampal neurogenesis, *Neurobiology of Aging*
- Bender et al., 2018, Prior Stress Promotes The Generalization Of Contextual Fear Memories: Involvement Of The Gabaergic Signaling Within The Basolateral Amygdala Complex, *Progress in Neuro Psychopharmacolocy and Biological Psychiatry*
- Blume et al., 2017, Sex-And Estrus-Dependent Differences In Rat Basolateral Amygdala, *The Journal of Neuroscience*
- Verma et al., 2017, Strain Specific Effects of Low Level Lead Exposure on Associative Learning and Memory in Rats, *NeuroToxicology*

Specifications - Operation

Camera	IR sensitive (lens 2.1mm and 4mm), visible light filtered
Active Silent Ventilation	With double chamber
Read-Out	USB to PC through ANY-maze, TTL I/O

Specifications - General

Shock Intensity	From 0.1 to 3mA, in 0.1mA steps
Shock Duration	Duration: from 0.5 to 60 seconds
Illumination	Dimmable visible light and IR light at 850nm
Sound	500Hz-18KHz, adjustable volume, max 100dB ± 3dB
White Noise	Adjustable volume, max 77dB ± 3dB
Power	100-240 VAC, 50/60 Hz, 60W max
Operating Temperature	10°C to 40°C; 5% to 95% RH (non-condensing)

Physical

Cubicle dimensions	Outer dimension: 52(d)x62(w)x58(h)cm	Internal 39(d)x47(w)x49(h)cm

Ordering informations

46001	Fear Conditioning 1 animal system
46001-2	Fear Conditioning 2 animal system
46001-3	Fear Conditioning 3 animal system
46001-4	Fear Conditioning 4 animal system
46002-D03	Rat Cage for Fear Conditioning for tethered animal
46004-D03	Mouse Cage XL for Fear Conditioning, for tethered animal
46004-D01	Fear Conditioning Cage with frontal vertical door
46005	Fear Conditioning Cage for Observational Learning
49603	Operant Fear Conditioning Cage
60000-FC	ANY-maze software, FC-specific version
60000	ANY-maze software full license (TGR and all other ANY-maze test included in the full version)

Optional items

46000-101	Electric shock meter for Fear Conditioning system (essential instrument to measure current between cages)

Extra warranty (standard 12 months + 12 months with product registration) available

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more than 40,000 citations in the main bibliographic search engines.

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TÜV SÜD
ISO 9001

Partner area