

LAM10/16/25 Locomotor Activity Monitor

The LAM10/16/25 Locomotor Activity Monitor uses infrared beams to characterize the pattern of movement in each of 32 individual tubes or vials.

A planar array of 3 or 9 radial beams crosses each tube at its midpoint, and when animals in the tube move through the array, the beams are interrupted and then registered as counts. Over the course of an experiment, which may last for days or weeks, the counting circuits continuously monitor each tube for activity, and at periodic intervals upload their count totals to the host computer for storage and analysis. This daily record provides a good measure of both the intensity of locomotor activity and the relative periods of rest in each tube.

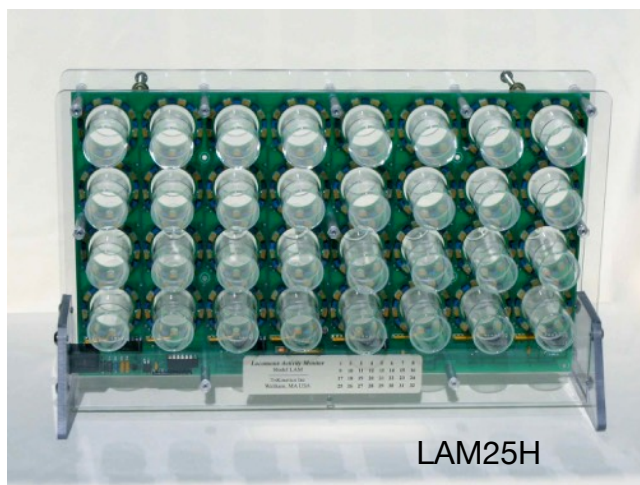
The unit is available in 3 tube sizes: 10, 16, and 25mm diameter, and either 3 or 9 beams. The 3-beam unit is appropriate for animal species with a standing height of at least 1/2 of the tube diameter. Otherwise the 9-beam high-resolution unit should be used to insure reliable detection.

Populations of *drosophila melanogaster* up to about 20 individuals may be accurately characterized by the LAM25H, which uses 25mm vials and 9 beams.

These units may be operated with horizontal tubes as shown, or rotated back 90 degrees to orient the vials vertically. An optional tube support plate mounts on the rear of the unit to register and support the tubes when vertical.

A 3-board version of each unit is available for additional measurement fidelity. These 3-board stacks, the LAM10H-3, LAM16H-3, and LAM25H-3, measure the activity in each tube with 3 independent beam arrays spaced at 10mm along the tube axis.

The unit is compatible with the PSIU9 hardware network and the DAMSystem3 data collection software application. Up to 120 monitors may be connected to a single system of this type.



Features

- 32 tubes of 10, 16, or 25 mm diameter
- 3 or 9 consolidated IR beams per tube
- Horizontal or vertical tube orientation
- Consistent operation in bright room light or darkness
- Ambient light sensor provides on/off record of entrainment cycles, stimulation pulses, and inadvertent light exposure.

Specifications

- Tube diameter: 10, 16, or 25mm
- Unit Dimensions: 13.0 x 4.7 x 7.8" (33 x 12 x 20 cm) LWH, without tubes
- Mass: 0.8 kg without tubes
- Ambient Light Sensor threshold: 10 lux nominal, photopic response curve
- Interconnect: 4 wire, 6 position, RJ-11 modular telephone line jack to PSIU9 DAMSystem network for 9V DC power input and data transmission
- Data collection software: DAMSystem3
- Operating environment: normal laboratory, non-condensing

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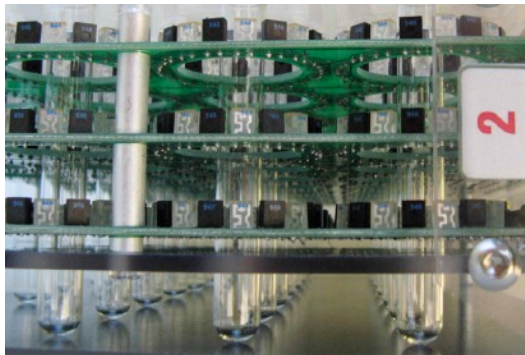
Available Models

3-beam: LAM10, LAM16, LAM25

9-beam: LAM10H, LAM16H, LAM25H

3-board: LAM10H-3, LAM16H-3, LAM25H-3

Vertical Tube Support plate: LAMVTS



LAM10H-3 in vertical orientation with vertical tube support

Tubes and Caps

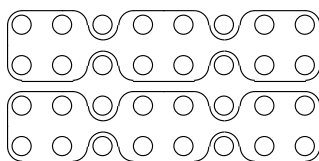
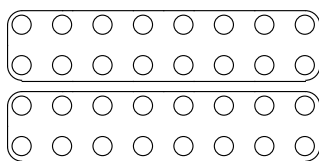
We can supply tubes in polished Corning glass of 10, 16, or 25mm diameter which are open on both ends. Standard scientific vials in 10, 16, or 25mm size may also be used, in either a plastic or glass material.

We can also supply vinyl tube caps in the 10, 16, and 25mm diameters.

Monitor Setup

Insert the tubes through the 32 holes in the monitor, and leave them centered so that the detection beam array will bisect the tube.

If captivation of the tubes is necessary to prevent sliding, use rubber bands, stretched first over the 4 corner tubes of 2 adjacent rows, and pressed up against the monitor surface. Then remove the tubes from columns 3 and 6, and reinsert them from above and below the bands as shown to place them into frictional contact.



Tube restraint

With the tubes installed, the monitor may be plugged into the DAMSystem network.

Units with the vial support plate may be operated in either a vertical or horizontal orientation. The plate's location or height may be adjusted by moving the nut pairs in parallel on each of the 4 screws. Tighten to snug by hand only.

Ambient Light Sensor

The ambient light sensor is set to discriminate light from dark at a nominal threshold of 10 lux, and will report its output with the count data at each collection bin. With Display Select set to Current Data (or Live) and #nnn, the sensor output will be displayed in real time, and may be used for diagnostic purposes. When File data is retrieved from the monitor at the end of each bin, the light sensor will report dark(0) only if dark for the entire preceding bin. If the sensor measures light above its threshold at any point during the bin, it will report light(1) for the bin, serving to detect door openings or other lights-on transients.

The sensor output (1 or 0) is reported in column 10 of the MonitorNNN file.

Data Collection

To verify that the monitor is operating properly, select Current Data (or Live) for the single monitor (#nnn) in question in the DAMSystem3 host application. The status box should be green (status 1), and the 32 channels of real-time count activity should be displayed. If a thin object such as a pencil point is moved through one of the tube cavities, the count total for that channel should increment.

The monitor will accumulate activity counts for as long as it has operating power, and will uplink its accumulated counts (and then reset to 0) whenever commanded to do so by the host computer. Counts will be accumulated in both total darkness and bright ambient light.

3-board units report data as 3 independent monitors, numbered consecutively from the bottom or rear board to the top or front board. The label shows the number for the middle board.

Precautions

Beware of operation in proximity to incandescent light, where stray infrared illumination can easily interfere with the exposed LAM detectors. Perform an empty-tube run to verify zero counts prior to operation with live specimens, and switch to LED lights if necessary.

Beware of liquid spills onto the green circuit board. Unplug the unit immediately if water or any liquid drips inside, and dry thoroughly in a warm (40C) oven prior to reuse.

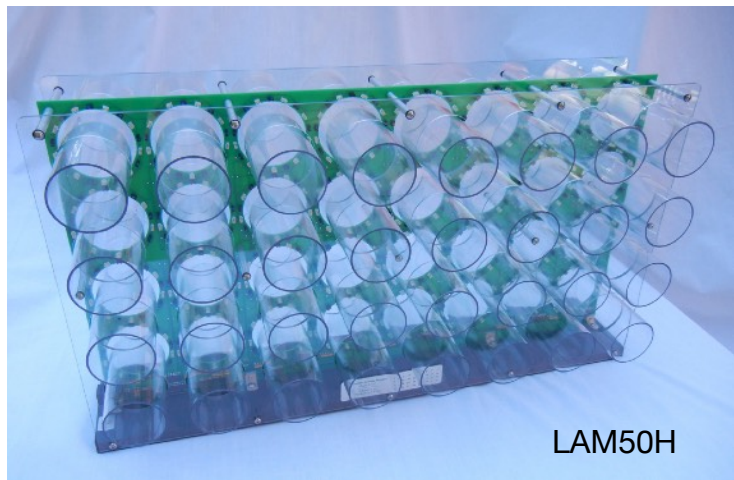
Additional information is available in the Help section of the DAMSystem3 data collection program.

LAM50 Locomotor Activity Monitor

The LAM50 Locomotor Activity Monitor is a scaled-up version of the LAM25, providing monitoring capability for larger animals which require 50mm diameter tubes.

It is available with 9-beams per tube, contains the ambient light sensor, and connects to the PSIU9/ DAMSystem3 data collection system.

Plastic tubes and caps are available.



Specifications

- 32 tubes, 50mm diameter
- 9 consolidated infrared beams per tube
- Dimensions: 23.0 x 5.0 x 13.0" (58 x 13 x 33 cm) LWH, without tubes
- Mass: 3.6 kg without tubes
- Ambient Light Sensor threshold: 10 lux nominal, photopic response curve
- Interconnect: 4 wire, 6 position, RJ-11 modular telephone line jack to PSIU9 DAMSystem3 network for 9V DC power input and data transmission