MOUSE◀E▶MOTION
UNIVERSAL MOBILE DATA LOGGER

Application Note 1

Motion Sensors
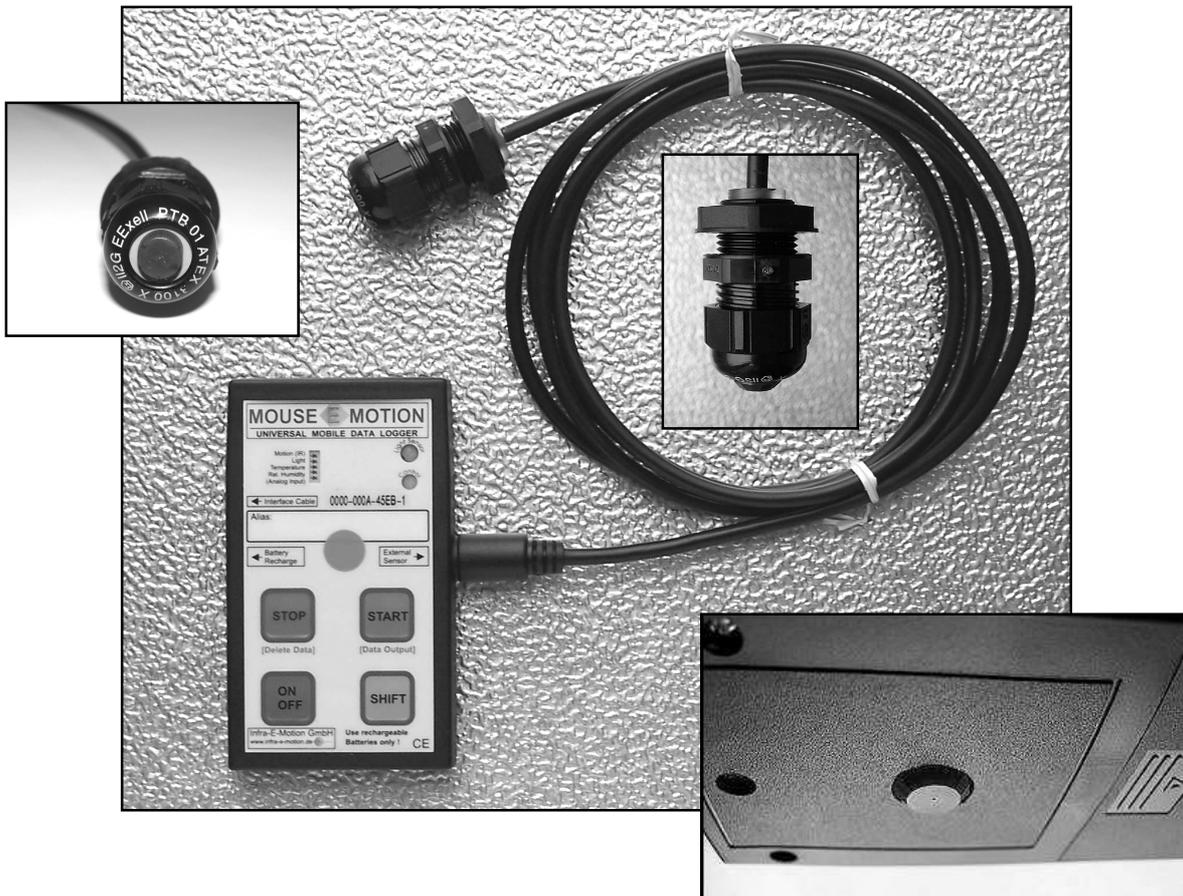
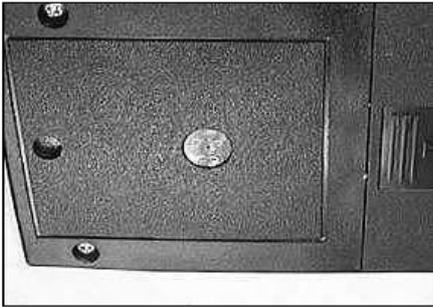# INFRA-E-MOTION
activity monitoring systems

Selecting the appropriate motion sensor

The motion sensors differ in their detection range and the geometry of the area they are covering:

The motion sensor of the *Spot* type has a rectangular detection base whereas the motion sensor of the *Slight Motion* type has a circular detection base and a wide-angle detection range, potentially covering a larger area (see figures below).
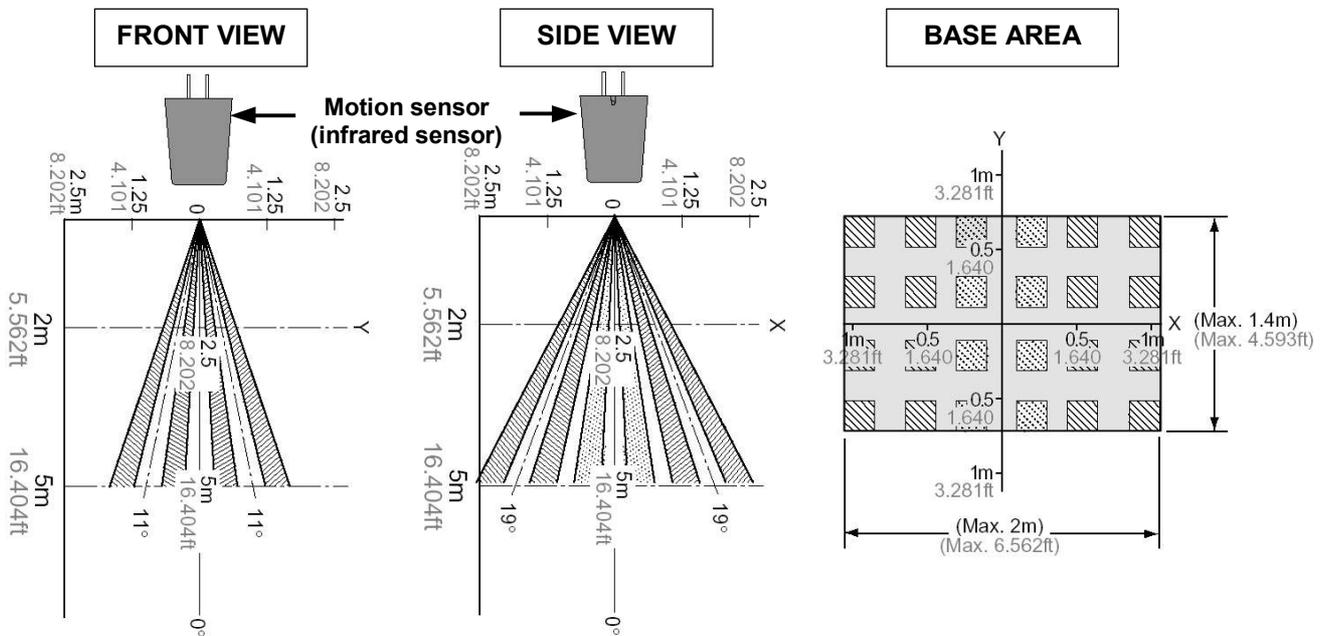
Spot type motion sensor (yellow mark):

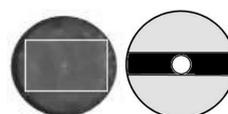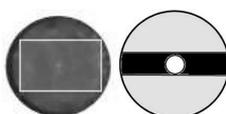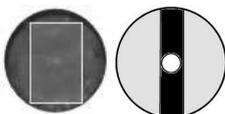Built-in: External:

Detection range:

FRONT VIEW	SIDE VIEW	BASE AREA

Motion sensor (infrared sensor)

Orientation of the sensor and the yellow colour mark on the back:

2

Slight Motion type motion sensor (green mark):

Built-in: External:

Detection range:

SIDE VIEW

Motion sensor
(infrared sensor)

BASE AREA
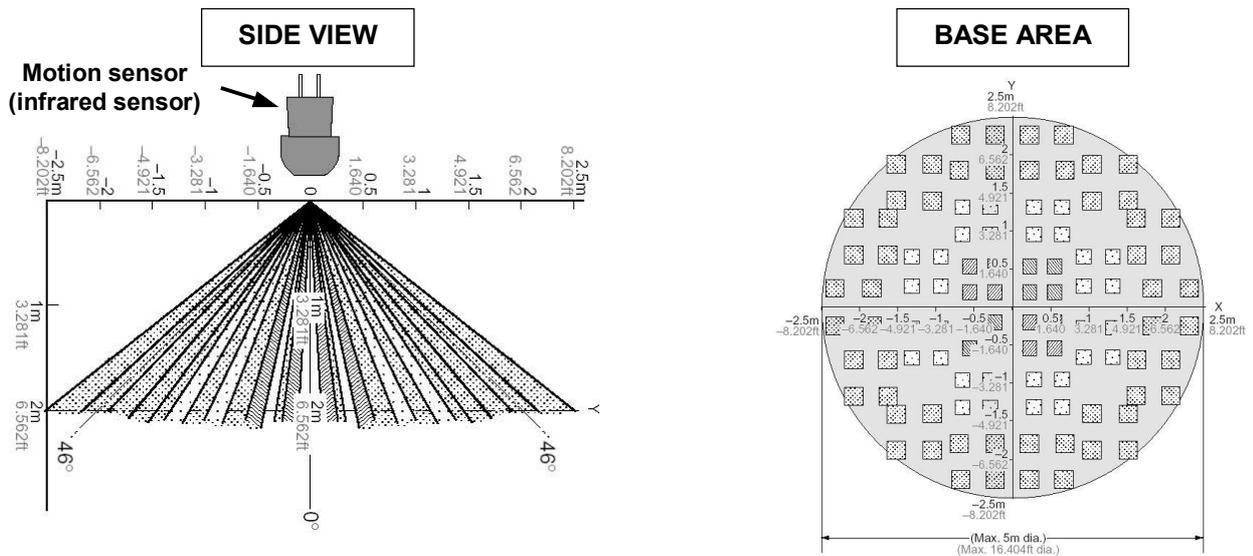
More information about the infrared-based motion sensors can be found on the website of the manufacturer NAiS:

*www.nais-e.com/bltn_reference/built/top.html?accept=yes*

Polycarbonate, acrylic or similar material usually is not permeable to infrared radiation. Thus, it is **not** possible to detect motion through walls of such material. The motion sensors should always have *direct* access to the object being monitored.

Connecting an external motion sensor to the data logger

An external motion sensor is connected to the 9-pin connector at the right side of the data logger:

To exclusively use an external motion sensor, the internal motion sensor has to be disabled. For this purpose, move the red switch (accessible after opening the battery compartment, see figure below) to the **OFF** position:
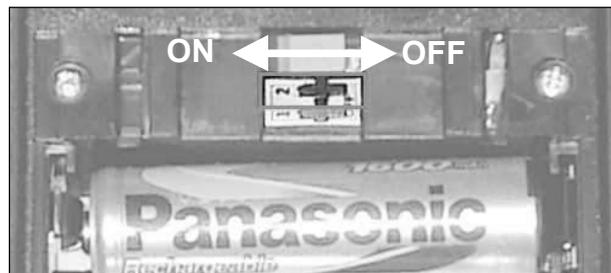
Keep in mind that it is necessary to move it back to the **ON** position and to disconnect the external motion sensor, if you want to exclusively use the internal motion sensor again! If an external motion sensor is connected and the internal motion sensor is not switched off, the signals of both sensors are mixed and it is not possible to differentiate which sensor contributed to what extent to the resulting value of a recording interval.

Ensuring consistent motion detection during activity monitoring

To ensure reliable detection of the entire motion within the experiment area, verify that motion is detected throughout the whole space of the experiment box and that motion of persons or other animals or objects outside of it is not detected.

When the *Slight Motion* type motion sensor is used, it is very unlikely that any region within the experiment area is uncovered, however, we suggest to test it despite of that. When the *Spot* type motion sensor is used, depending of its position above the ground of the chamber, it is possible that not the whole area might be covered.

A method to test the proper detection inside an experiment box might be the following:

Draw the shape of the bottom of the experiment box on paper. Fix the motion sensor/data logger exactly in that height and position above the paper that it would have if it were placed on the cover of the box. Now slowly move the tip of a finger pointing from the outside of the rectangle to its inside in a height of 2 to 3 cm above the line. On the front of the data logger, you should see a permanent flashing of the triangle-LED with the tip to the top. If no signal is visible, motion cannot be detected in the respective region the finger moves. Accordingly, the motion of an animal moving in that part of the experiment box would not be detected with certainty.

View from above:

Shape of experiment box

Tripod or similar to fix the data logger
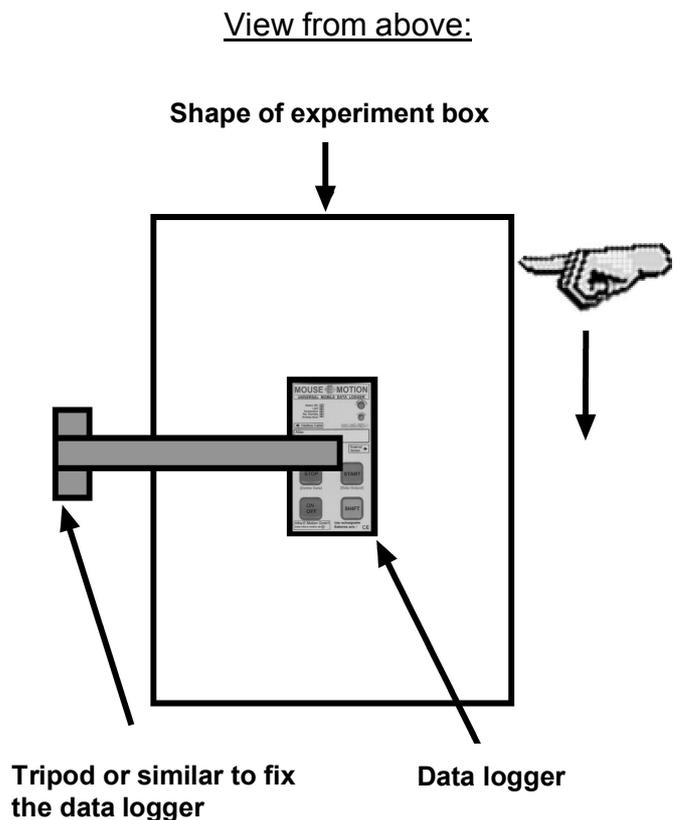
Data logger

To ensure that no motion outside an experiment box is detected, position the motion sensor/data logger over the empty box (no animal inside) as you would do it during the real experiment. Now, move your hand around the box and watch the LED-indication on the front of the data logger. No signal should occur. If the triangle-LED with the tip to the top flashes, additional shielding of the box is necessary to avoid false detections.