Home Cage Activity Monitoring

MLog

Europe:
BIOBSERVE GmbH
Koenigswinterer Str. 418
53227 Bonn
Tel.: +49 228 20 160 20
Fax: +49 228 20 160 29

North America:
BIOBSERVE
2125 Center Ave., Suite 500
Fort Lee, New Jersey 07024
Tel.: 201-302-6083
Fax: 201-302-6062

www.biobserve.com   info@biobserve.com

Features I

Measuring activity

The infrared sensors of the MLog system measure the activity of an animal by recording the body heat of that animal and its spatial movement. The activity is measured in all three dimensions in the range of the sensor. Since infrared radiation cannot pass through standard cage plastics, sensors in neighbouring cages do not interfere with each other. The system can be used with any cage size.

Ten times per second

Each sensor measures the activity of an animal ten times per second (10 Hz), independently of the total number of sensors in use. In competitive systems the data rate decreases with an increasing number of sensors. Although we work with a high data frequency, MLog can run over 24 hours a day 7 days a week and enables you to collect data for your research studies including for phenotyping or to simply monitor the health and welfare of your animals.

Individual and pooled data

You can divide the animals into groups (e.g. control and test doses) and the software calculates and presents the pooled data in real time. Thus you can compare the results of the different groups even while the experiment is ongoing.
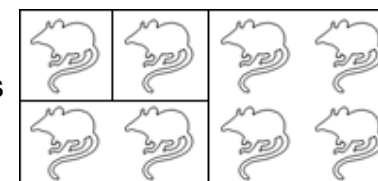
Real time data analysis and visualization

At the same time, during the experiment the data are also being analyzed and can be presented in user friendly graphs and diagrams. This feature enables you to evaluate the experiment even while it is running so you can decide if you want to continue or stop the experiment and refine the selected parameters.
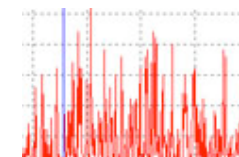
Features II

Further processing of data and graphics

The data, once collected, can be exported to other applications. Further individual data manipulations can then be conducted. All diagrams and graphics which have been generated during the experiment are saved in vector graphic format (wmf) thereby making them easy to integrate and work with in other programs.

Export filters for the data:
*.txt, *.doc, *.csv, *.xls, *.xml
Export filters for the graphs:
*.bmp, *.wmf, *.emf

State of the art network technology

The sensors communicate with the computer via the TCP/IP protocol, the standard data communication protocol. Thus the data flow is fast and reliable and you can connect several hundreds of sensors to one computer. The sensors are linked with stable standard (Ethernet CAT-5) network cables whereby the same cable transports power and data simultaneously. This makes for very easy wiring.

Remote control

The MLog system can be accessed via the Internet or the Intranet so making it possible to control an experiment or to analyze data from virtually anywhere in the world. Thus our scientist clients can be based in one location with their experiments being conducted in another, distant location. And teams of scientists in multiple locations can run shared experiments and all be able to access their data.

Phenotyping integrated in biocontainment systems

MLog can be integrated into biocontainment housing systems such as the BioZone IVC systems (http://www.biozoneglobal.com). The ability to remotely control the experiment is ideal since it reduces the necessaity to enter the animal area either to perform experiments or to analyse data.

System Components

The MLog system consists of different hardware components:

Activity Unit: contains the IR-sensor and is mounted on the cage
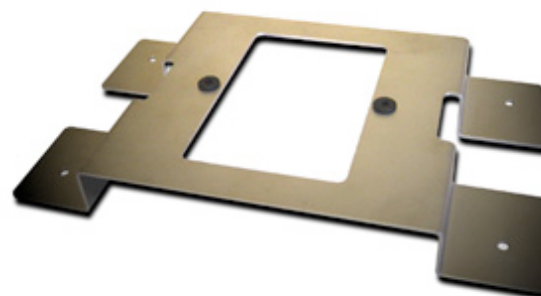**Central Unit:** manages the data transfer between several Activity Units and the computer
Cage Holder: used to mount the Activity Unit on the cage

Front of the Activity Unit

Each Activity unit gets a unique number, shown in the display at the front. Thus it is very easy to assign the acquired data to each cage.

Cage holder

The stable cage holder is fixed on the cage. The Activity Unit is plugged on the holder.

RJ45 port to wire the units with stable Cat.5 cables. Power and data go through the same cable, daisy chaining the units.

Seriel port to connect and control external hardware (e.g. food suplier)

Additional sensor input

Activity Unit

Network   Aux   Sensor

Copyright BIOBSERVE GmbH

On   Tx   Log   Link

1002 - 1233

IR-Sensor

System Architecture

There are several options for setting up the MLog system.

In the **standard installation**, the MLog hardware (Activity Units and Central Unit) is installed in the animal room and the MLog software is installed on one computer that is directly connected with the Central Unit. To control the experiment or analyze the data one has to be present in the lab.

In the **enhanced installation**, the MLog software is running on an Application server, allowing one to control and view the experiment from different computers at different locations with the MLog client software. With this solution, different experiments can be performed at the same time and different individuals can simultaneously use the system.

Standard Installation

All the MLog hardware is located in the animal room and the computer with the MLog software is connected directly to the Central Unit. One experiment can be perfomed at a time and only at this computer can the experiment be controlled and analyzed.
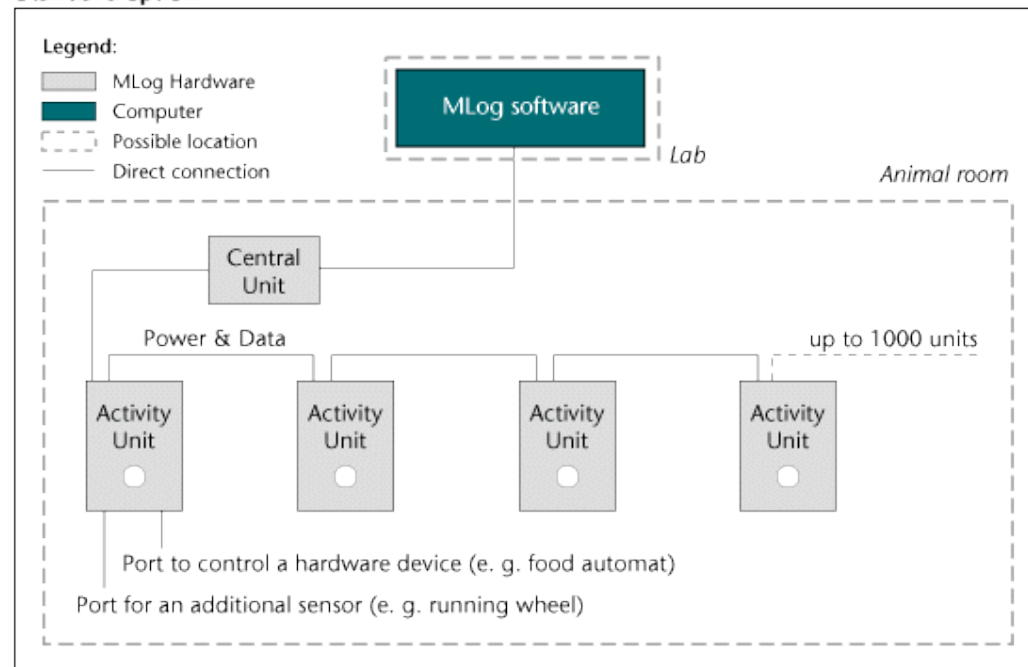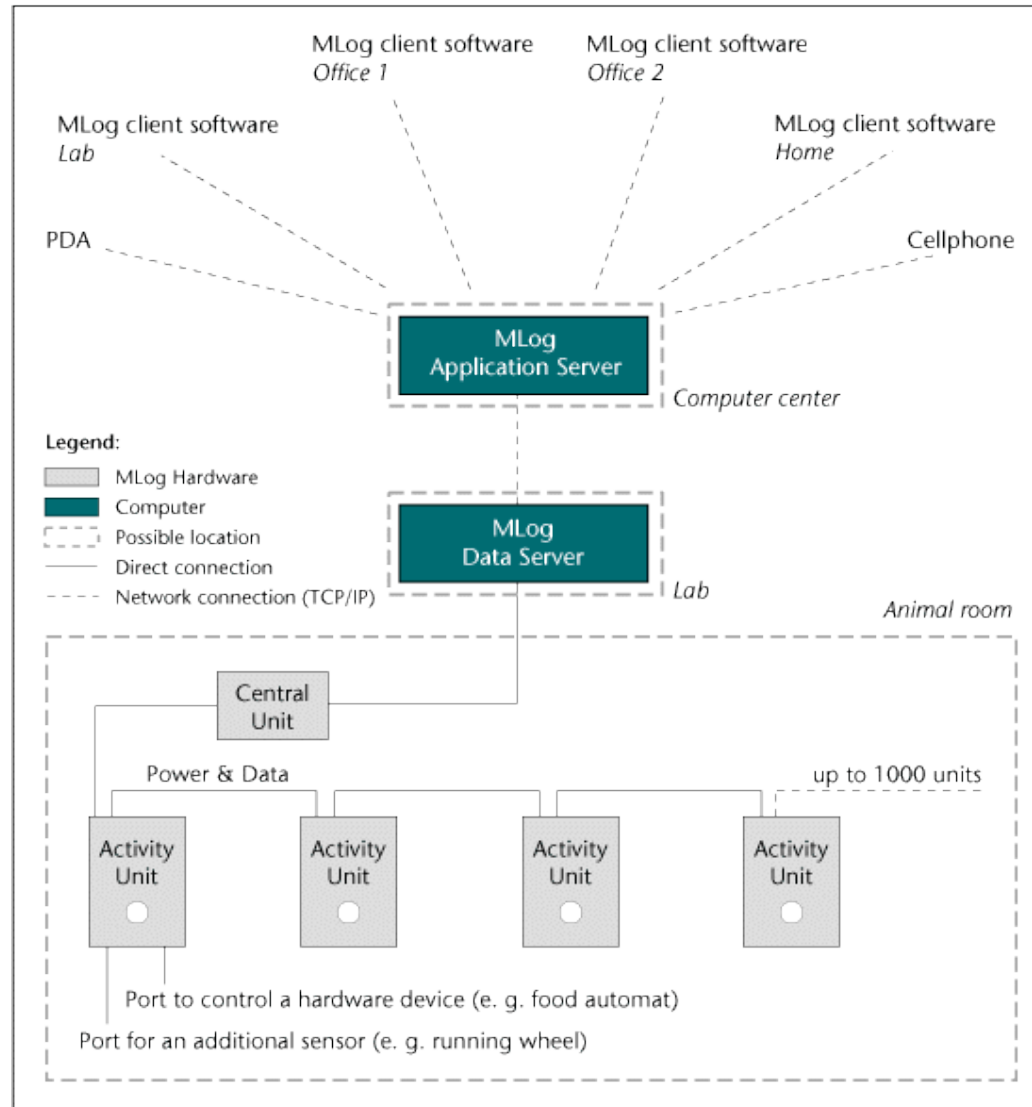
Enhanced Installation

Enhanced option

The MLog hardware is installed as described previously.

However the Central Unit is connected to the MLog Data Server, a computer, that is located near the animal room. This computer is connected via the Intra- or Internet with the MLog Application Server which manages all the configuration and data files. With the MLog client software, it is now possible to log onto the Application Server from any computer connected to the Intra- or Internet. You can control and analyze your experiments from multiple locations or you can, for example, observe an experiment live during a conference call. Even with a PDA or a cellphone you can control the data acquisition. It is also possible to perform multiple experiments at the same time with this set up.

Program Tour - Configuration/Activity Unit Management

Activity units

All activity units in use are shown.

Activity unit description

You can enter a description for each single activity unit (i.e. for each animal). This may be an animal number or test substance for example.

Groups

You can group the units and enter a description for each group. Even during the experiment, the group data will be calculated and presented in real time.

Application Server & Central units

Technical preferences for internal data communication.

Program Tour - Configuration/Experiment Description

Experiments

Number of experiments in the system.

Description

Description of the experiment.

Filename

Filename of the experiment.

Time and date

You can select whether real time or absolute time is used for the experiment and you can use the automatic start and stop option.

Program Tour - Configuration/Experiment Description

Activity classes

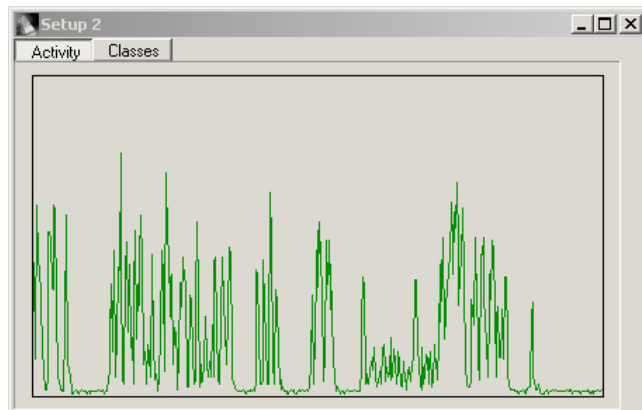Division of the ten activity classes.

Interval data

Time interval of the summary data.

Actogram

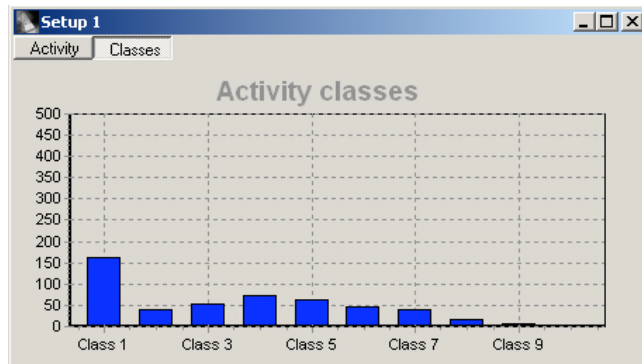Time interval and threshold of the actogram

(also can be changed later).

Program Tour - Data Acquisition

During the experiment, the data are calculated and presented in real time. Thus it is very easy to evaluate an experiment even while it is ongoing.

For each animal, the current activity level is presented.

**Also the activity classes are shown for each unit.**

Of course all data are also presented.

Program Tour - Data Analysis I

The integrated data analysis offers a wide range of options for analysis and visualisation of the data. You can, for example, group the data of different animals from several experiments and then perform intra- and inter-group calculations and comparisons.
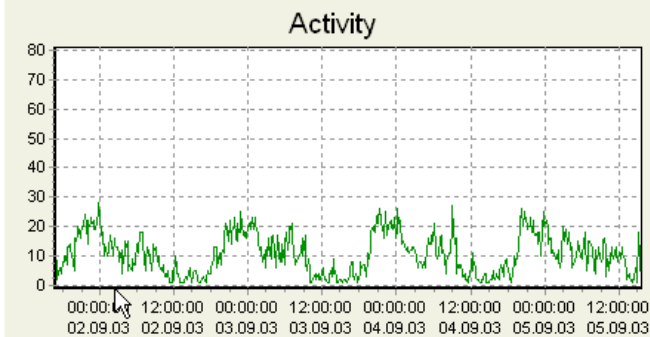
This figure shows the activity rhythm of a rat over four days. You can clearly see the circadian rhythm. MLog allows you to compare the activity data of animals or groups very simply. Just select the units you want to compare in the pop up window and the diagram is redrawn with the selected data. Thus it is very easy to compare different animals or groups. Of course the diagrams can also be printed and saved.

This figure is animated in the Power Point file.
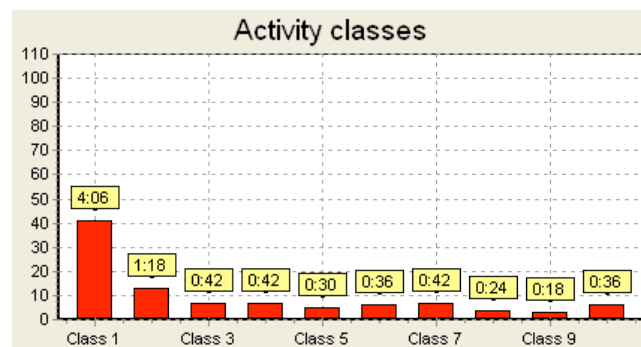
This bar chart shows the time the selected animal spends in each of the ten possible activity classes. The activity classes are a means to divide the activity values into ten groups to provide a more detailed view of the activity seen.
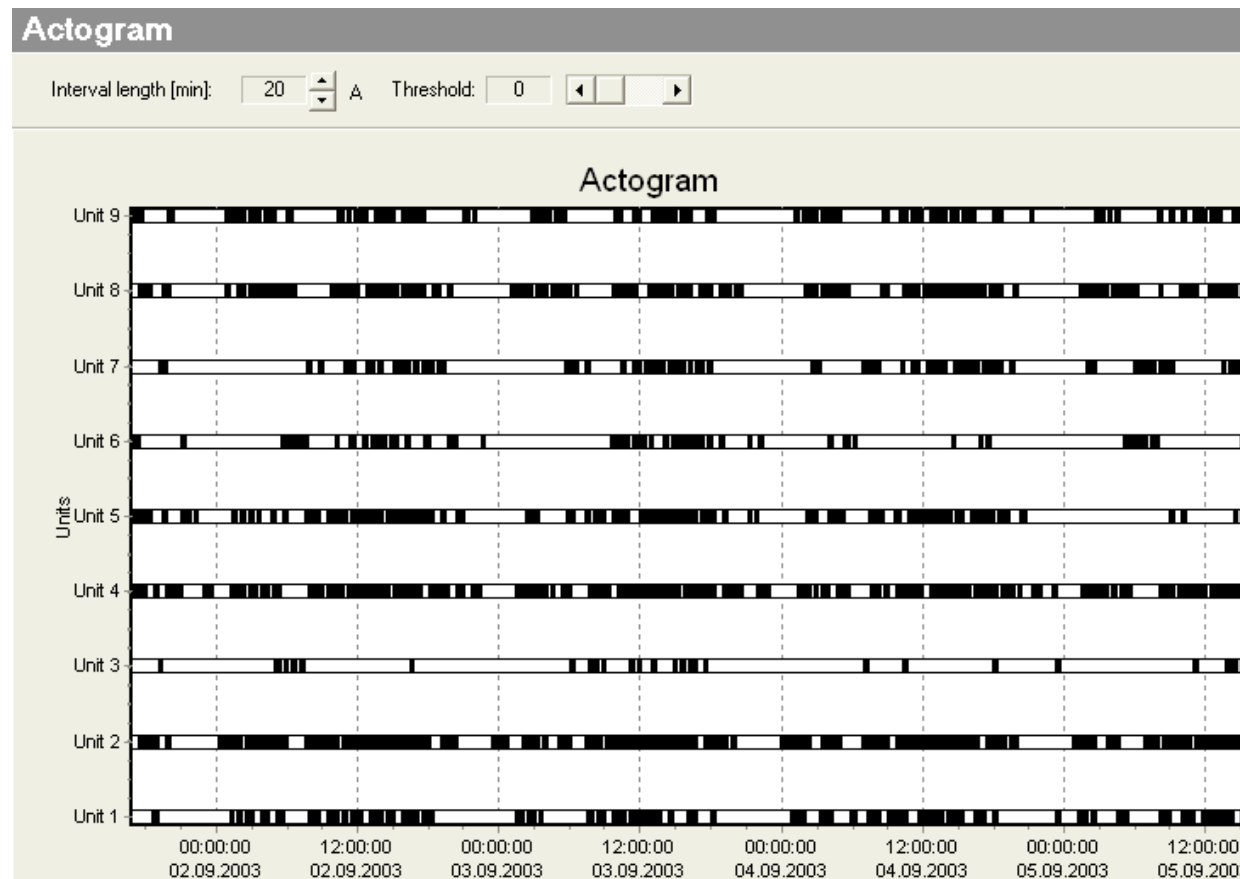
Program Tour - Data Analysis II

The actogram

An actogram shows the activity/inactivity of an animal based upon a definable threshold. White symbolizes activity, black inactivity

The actogram is calculated based on two parameters; the activity threshold and the time interval. Both parameters can be changed and the actogram is recalculated in real time. The diagram can be copied and saved in different file formats.

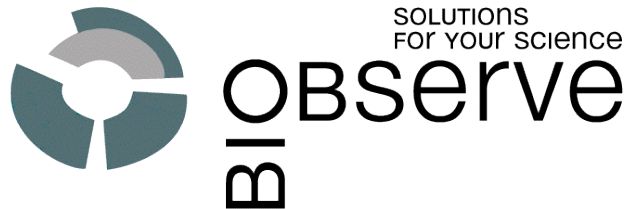This figure is animated in the Power Point file.

Thank you!

Thank you very much for your interest in our solution.

We hope we could provide you an useful overview over the features and capabilities of our Home Cage Activity Monitoring Solution „MLog".

If you have further questions, please do not hesitate to contact us.

SOLUTIONS
FOR YOUR SCIENCE
BIOBSERVE

Europe:
BIOBSERVE GmbH
Koenigswinterer Str. 418
53227 Bonn
Tel.: +49 228 20 160 20
Fax: +49 228 20 160 29

North America:
BIOBSERVE
2125 Center Ave., Suite 500
Fort Lee, New Jersey 07024
Tel.: 201-302-6083
Fax: 201-302-6062

www.biobserve.com   info@biobserve.com