



Animal Activity Monitor

March 2010

INSTRUCTION MANUAL

Activity Monitor for Return®

2701 Kent Avenue
West Lafayette
Indiana 47906

www.BASInc.com

BASi products are trademarks of Bioanalytical Systems, Inc.

MANUFACTURER'S NOTE

This instrument, either wholly or in part, is manufactured for research purposes only. This instrument should be operated only by trained laboratory personnel. Use for medical diagnosis is not intended, implied or recommended by the manufacturer. Use and maintenance of this instrument and accountability for the same rests entirely with the user.

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Safety Precautions

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific WARNINGS, CAUTIONS, or NOTES elsewhere in this manual may impair the protection provided by the equipment. Such noncompliance would also violate safety standards of design, manufacture, and intended use of the instrument.

Bioanalytical Systems, Inc. assumes no liability for the customer's failure to comply with these requirements.

- For indoor use only.
 - Ground the Instrument. To avoid electric shock, the instrument must be grounded with the supplied power cable's grounding prong.
 - DO NOT exceed the operating input power, voltage, current level and signal type appropriate for the instrument. Refer to the Installation Section for further information.
 - Electrostatic discharge (ESD) can damage the highly sensitive microcircuits in your instrument. ESD damage is most likely to occur as the I/O connectors are being connected or disconnected. Protect them from ESD damage by wearing a grounding strap that provides a high resistance path to ground. Alternatively, ground yourself to discharge any static charge built-up by touching the outer shell of any grounded instrument chassis before the I/O connectors are connected or disconnected.
 - DO NOT place the instrument in fluid or expose the internal elements and/or back panel to fluid.
 - DO NOT Operate in an Explosive Atmosphere. Do not operate the instrument in the presence of inflammable gasses or fumes. Operation of any electrical instrument in such an environment clearly constitutes a safety hazard.
 - Keep Away from Live Circuits. Operators must not remove instrument covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components with the power cable connected. Under certain conditions, dangerous voltage levels may exist even with the power cable removed. To avoid injuries, always disconnect the power and discharge circuits before touching them.
 - DO NOT Service or Adjust Alone. Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.
 - DO NOT Substitute Parts or Modify the Instrument. To avoid the danger of introducing additional hazards, do not install substitute parts or perform unauthorized modifications to the instrument. Return the instrument to the Bioanalytical Systems, Inc. Service Department for service and repair to ensure that safety features are maintained in operational condition.
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If you notice any unusual conditions as listed below, immediately terminate operation and disconnect the power cable. Contact the Bioanalytical Systems, Inc. Service Department for repair of the instrument. If you continue to operate without repairing the instrument, there is a potential for hazard or damage to both the equipment and the operator.

- Instrument operates abnormally
- Instrument emits abnormal noise, smell, smoke or a spark-like light during operation
- Instrument generates high temperature or electrical shock during operation
- Power cable, plug or receptacle on instrument is damaged
- Foreign substance or liquid has penetrated the outer cover of the instrument.
- LCD displays an ERROR message

Throughout the course of this manual, the following will be used to designate important information:

WARNING - This signifies an extreme hazard. Not following the instructions may result in serious injury or death.

CAUTION - Following information relates to a hazard. If instructions are not followed properly, it can result in irrevocable damage to the instrument.

NOTE - This implies that the following instructions are essential for the user to understand in order to operate the equipment effectively.

Symbols:



Caution: Risk of Danger. User's Manual must be consulted in all cases where this symbol is marked.



Alternating current.



Fuse.



On (Supply).



Off (Supply).



Complies with European Union Directives



The European Waste Electrical and Electronic Equipment (WEEE) Directive

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Section 1. Introduction

This Manual

This manual covers the installation and operation of the Animal Activity Monitor for the Ratern System. Updates for the manual will be available to users on the Culex Users Forum at the following URL: : <http://www.basinc.com/nsrch/phpBB3/>

Product description

The Animal Activity Monitor collects information on animal movement when an animal is tethered in a Ratern Animal Containment System. The monitor records clockwise, counterclockwise, and rearing activity.

- Collect data in a low stress manner
- Maintain the animal's health and comfort throughout the study
- Maximize technician efficiency
- Work within animal care and use regulations

Features

- One system collects data from multiple Raterns
- Easy to use software with automatically generated electronic report
- Analysis software allows user defined data sorting.

Applications

- Pharmacodynamics
- Safety Pharmacology
- Behavioral Pharmacology
- Neuroscience

Section 2. Installation

Environment

- For indoor use only
- Place on a stable, level surface
- Do not place instruments in direct sunlight

The Animal Activity Monitor is designed to operate under the following environmental conditions:

- Temperature: 10° C to 35° C
- Humidity: 15% to 50% (relative humidity)
- Pressure: 75KPA – 106 KPA
- Altitude: < 2,000 meters
- Pollution Degree 2

CAUTION: The Animal Activity Monitor must be protected from temperature extremes that could cause condensation within the instrument.

Power Source Requirements

The Animal Activity Monitor requires a power source that meets the following specifications:

- Voltage: 100-240 Volts VAC (auto select)
- Frequency: 50-60 Hz
- Power Consumption: 40 VA (max)
- Connections: The power cable uses a three-wire system in accordance with international safety standards. When connected to an appropriate ac power outlet, this cable grounds the instrument frame.

WARNING: To protect against electrical shock, the power cable grounding prong **MUST** NOT be removed.

WARNING: Failure to comply with these requirements may result in injury to both the user and the equipment.

Identification of Parts



Activity Monitor

- Activity Monitor Controller
- 4 tan monitor cables
- 1 power cable
- 1 USB cable



Front Panel

- A. USB port
- B. Indicator Lights



Back Panel

- A. Monitor ports
- B. Socket for power cable
- C. Power switch

Installation Procedures

1. Place the Activity Monitor controller on a stable, level surface.



2. Connect a tan Return monitor cable from the monitor port on the back of each Return controller (**A**) to one of the monitor ports on the back of the Activity Monitor controller. **NOTE:** If you have an older Return with three or four colored ports, you will need to exchange the tan monitor cables for a cable with banana jacks (EW-7508 – three port; EW-7514- four port). Please contact BASi to make the exchange.
3. Make sure that the power switch is in the OFF position. Plug one end of the power cable into the back of the Activity Monitor controller, and the other end into a grounded outlet.
4. Connect the USB cable from the front of the Activity Monitor controller to a computer.
5. Turn on the Activity Monitor controller. The LED indicator lights on the front of the Activity Monitor controller will briefly flash to indicate that the power is ON.

Section 3. Software (Version 1.0)

Purpose

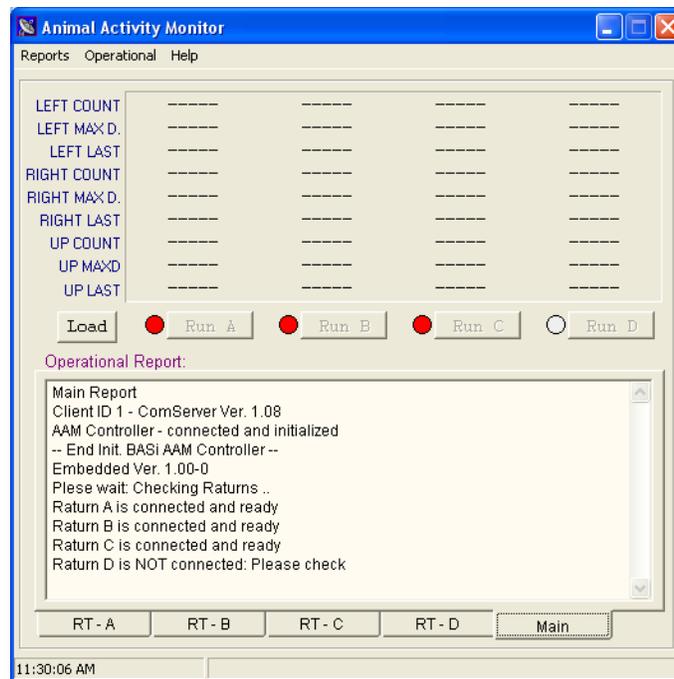
The laptop computer functions as an archive for data gathered by the Returns and as a user interface. It allows the user to upload experimental methods to the Animal Activity Monitor.

Operating System

The User Interface Software operates under the Windows operating system. Win XP is the standard, and the software will also run on Windows 2000 operating systems.

Initializing the Components

The Returns are registered and logged in by their station identity (A, B, C, or D). If all the Return controllers are correctly connected and powered, the initialization process should be completed in less than a minute, and the "Status" screen will be loaded. If anything is wrong, the initialization process will stop and indicate the source of the problem. To determine the source of the problem, consult the Initialization Checklist below. After fixing the problem, click the Retry button and wait until the initialization process is complete.



Initialization Checklist

1. Does the Activity Monitor Controller have power?
2. Is the USB cable properly connected from the Activity Monitor controller to the computer?
3. Is the USB cables intact and undamaged throughout its length?
4. Do the Return controllers have power?
5. Are the Return controllers properly connected to the Activity Monitor controller?

Status Screen

Once initialization is complete, the Status screen will appear. A red light appears next to each station that is available for programming. If a station is incomplete or disconnected, no light will appear, and no method can be loaded to that station.

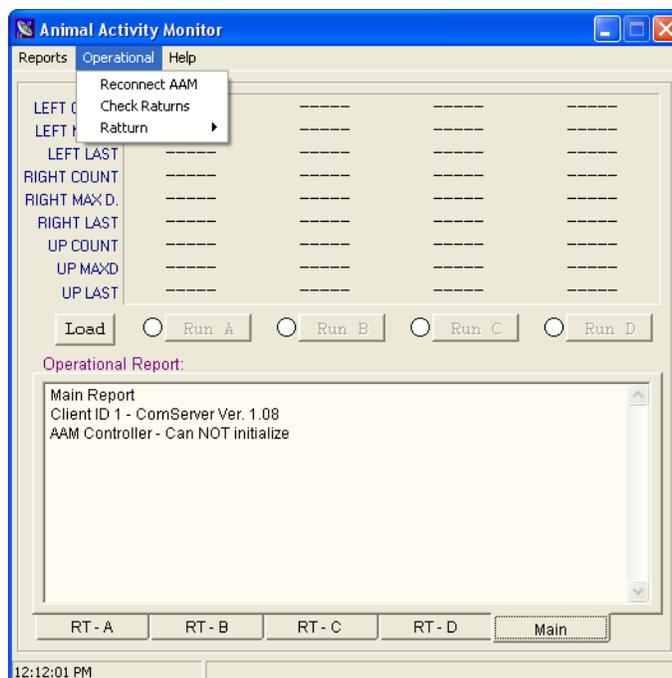
The top box of the Status screen displays animal activity summary information. This area keeps count of how many times the animal has moved in a given direction, as well as the maximum duration of movement in that direction, and the most recent movement. For the purposes of animal activity, right refers to clockwise movement, and left refers to counterclockwise movement.

The lower box of the Status Screen displays the data currently being collected from each Return. To display data from individual Returns, click on the appropriate button at the bottom of the screen (Rt A, Rt, B, etc).

Reconnecting Returns

To reconnect the software to the Animal Activity Monitor, or to reconnect to a Return controller, click the Operational pulldown menu at the top of the status screen. To reconnect the software to the Animal Activity Monitor, click "Reconnect AAM". The Animal Activity Monitor must be connected to the software in order to collect data from any Returns.

CAUTION: Clicking "Reconnect AAM while the Animal Activity Monitor is still collecting data will cause data to be lost from all Return stations.



To reconnect an individual Return, click "Check Returns". Use this option if a Return did not initialize during startup, and you want to re-initialize that component, or if you are adding a Return while collecting data from other Returns. A Return must be connected to

the software in order to collect data from it. **NOTE:** Clicking “Check Return” will not affect data collection in currently operating Returns.

Defining Returns

The Animal Activity Monitor can be used with older Return controllers, with the speed adjust dial, or with newer Return controllers without the dial. To define which Return type you have, go to the Operational pulldown menu and click on “Return”. Select Old or New Return.

Load a Method

To specify the animal activity collection time and to assign a filename in which the data will be saved, a method must be loaded for each Return station. To load a method for activity, click on the Load button at the left of the Status screen. This will bring up the Load screen. On the Load screen, input the length of the collection period. When inputting the hours and seconds parameters, there must be two digits typed in each box. For example, for a run of two hours and 5 minutes, type “02” and “05” in the boxes. **NOTE:** The maximum collection period is 7 days, 12 hours, 33 minutes.

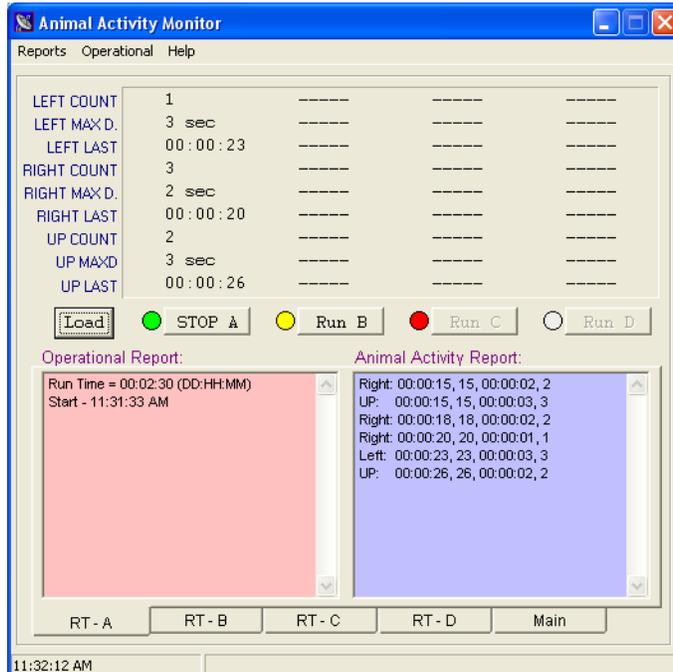
RT	Time (DD:HH:MM)	File Name
A	00:02:30	Test_A.aam
B	00:00:00	Test_B.aam
C	00:00:00	Test_C.aam
D	00:00:00	Test_D.aam

Select a report name for the file, and click on the appropriate Return (station ID A,B,C, or D) to load the method. Each animal will have its own unique report file. Once the method is loaded, the collection time will appear in the left-hand column, and the selected report file name will appear in the right-hand column. Click Exit to return to the Status screen. **NOTE:** the default directory for saving reports is the Reports subfolder in the AAM folder. To save a report file in another directory, click “Select Report File”, choose the directory, and then type the name of the file in which you wish to save your data.

Run a Method

Once a method has been loaded, the indicator light next to the station becomes yellow. To run a method, click on the Run button for each station. The light now becomes green, and the program is collecting data. The LED's on the Activity Monitor controller associated with each active station will be lit during the duration of the programmed collection period. For each station, you can view the operational report and the animal activity report. The operational report indicates the run time that has been programmed, the start time, and the

stop time. If the method is stopped by the user before the run has ended, a note will appear in the operational report.



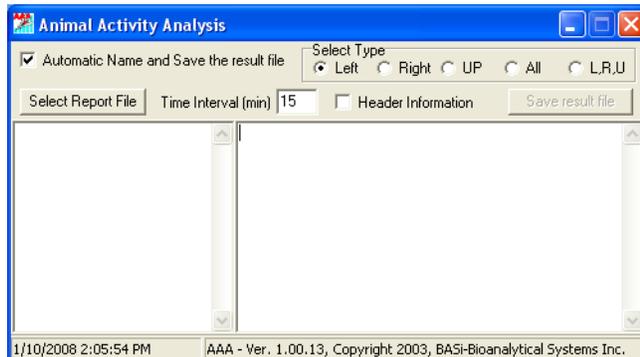
The animal activity report shows each sensor activation for the station. It indicates the direction of activation, the relative time of activation (relative to start) in HH:MM:SS format and in seconds, and the duration of activation (in HH:MM:SS format and in seconds).

Finding Reports

After a method has finished, the report files can be found in the directory in which they were saved. Report files are saved as .txt files, and can be imported to Excel. To access report files directly from the Activity Monitor, click on the Reports pulldown menus, and select "Show/Print". This will allow you to access any report file.

AAA software

The AAA software program allows the user to sum activity into "bins", or time intervals. Since many activity events are measured in seconds, binning data is a convenient way to look for activity trends. To bin data, open the AAA program by clicking on the icon.



Before choosing a report file, select the bin parameters:

1. **Select Type** - Choose the type of data to analyze. Choosing L (left), R (right), or U (up) will create a file with only that type of data. Choosing All will cause all movement data to be binned with no differentiation between the type and direction of movement. L,R,U creates a file with each type of data binned separately.
2. **Time Interval** - Enter the size of the bin. This must be a whole number, and is specified in minutes.
3. **Header Information** - Clicking this box will include the first part of the Culex report file in the binned activity file, including the species, catheter type, author and notes, and the Method File section of the report.
4. **Automatic Name and Save** - Checking this box will create a separate file with a filename describing how the data was binned. The filename will include the name of the original report file, the bin interval, and the type of data, and will be saved as a text file. For example, a report file entitled RatA, binned into 30 minute segments, of type L,R,U will have a filename of RatA_30min_LRU.txt. If you choose to name your own file, do not check this box. You will be able to save the result file later. The default location for the file will be the same location as the original report file.

Convert Column
B to a whole
number
(sec)

Which
Sensor?

Bin
(**Time**
Interval)

Sensor
Duration
(in Seconds)

Sensor
Counts

	A	B	C	D	E	F
1	Left	0:30:00	1800	91	29	
2	Right	0:30:00	1800	205	33	
3	UP	0:30:00	1800	1660	34	
4	Left	1:00:00	3600	92	28	
5	Right	1:00:00	3600	273	38	

The binned activity file will be a text file (*.txt) which can be imported into Excel as a comma delimited file. The table will contain the following data:

1. Which sensor was activated (left, right, or up), if it has been separated by direction
2. The time interval for the bin in minutes
3. The time interval for the bin in seconds
4. Total duration of all sensor activations for that bin (in seconds)
5. Total number of activations of that sensor for that bin (counts)

NOTE: It is possible to have a sensor activation with a duration of 0 seconds. The software rounds to the nearest whole number. Any short activation (less than 0.5 seconds) will be recorded as 0. However, the activation itself will still be recorded. A series of short sensor activations can result in multiple counts in the "counts" column, with a total duration of 0 seconds in the "duration" column.

Section 4. Contact BASi

Contact Information

For questions about basic operations of this instrument, or in case of equipment failure, please contact BASi and ask for Culex product support. For instruments that are out of warranty and not covered under a service plan, a cost estimate for repair will be provided.

Bioanalytical Systems, Inc. (BASi)
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FAX: (765) 497-1102
EMAIL: invivo@BASinc.com

Shipping Damage

Orders are normally shipped prepaid via a ground service and charges include an insurance fee to cover loss or damage in transit. If you do not wish to pay for shipping insurance, your order must also include a waiver saying that you take full responsibility for any damage or loss incurred on the item once it leaves our dock. Claims on insured items must be made within 30 days of the ship date.

1. For items shipped with insurance, please contact BASi order entry (800-845-4246 or 765-463-4527) for assistance.
2. Have the model and serial number of the damaged instrument available
3. Save the box and all packaging materials that accompanied the item for return shipment to BASi
4. You will be given a Return Authorization Number (RA#). This number must be placed on all labels and documents accompanying the returned product.

Limited Warranty

BASi warrants equipment manufactured by the company to be free of defects in material and workmanship for a period of one year from the date of shipment, except as provided hereinafter. This assumes normal usage under commonly accepted operating parameters and excludes consumable products.

BASi agrees either to repair or replace, at its sole option and free of part charges to the buyer, any parts of such instrumentation which, under proper and normal conditions of use, prove to be defective within 90 days from the date of shipment. This warranty and remedy are given expressly and in lieu of all other warranties, expressed or implied, of merchantability or fitness for a particular purpose and constitutes the only warranty made by BASi.

BASi neither assumes nor authorizes any person to assume for it any other liability in connection with the sale, installation, service or use of its instrumentation. BASi shall have

no liability whatsoever for special, consequential, or punitive damages of any kind from any cause arising out of the sale, installation, service or use of its instrumentation.

All products manufactured by BASi are tested and inspected prior to shipment. Upon prompt notification by the Buyer, BASi will correct any defect in warranted equipment of its manufacture either, at its option, by return of the item to the factory, or shipment of a repaired or replacement part. BASi will not be obliged, however, to replace or repair any piece of equipment which has been abused, improperly installed, altered, damaged, or repaired by others. Defects in equipment do not include decomposition, wear, or damage by chemical action or corrosion, or damage incurred during shipment.

Limited Obligations Covered by this Warranty

1. In the case of instruments not of BASi manufacture, the original manufacturer's warranty applies.
2. Shipping charges under warranty are covered only in one direction. The buyer is responsible for shipping charges to the factory if return of the part is required.
3. This warranty does not cover damage to valves, lamps, seals, or columns due to improper installation by the buyer.
4. Thin-layer amperometric cells and working electrodes are limited to 60 days.
5. Warranty for valves is limited to 30 days.
6. Expendable items, including but not limited to microdialysis probes, reference electrodes, chemical standards, prepared solutions, lights, fuses, O-rings, gaskets, glass items, membranes and filters, are excluded from warranty.
7. Failure by the customer to perform normal and reasonable maintenance on instruments will void warranty claims.
8. If the original invoice for the instrument is issued to a company which is not the company of the end user, and not an authorized BASi distributor, then all requests for warranty must be processed through the company which sold the product to the end user, and not through BASi or its distributors.