

Tail Suspension Monitor

Monitoring the effects of antidepressants in small laboratory animals

– Specifications subject to change without notice –

TSE Tail Suspension Monitor



General information

The **TSE Tail Suspension Monitor** is a device for screening antidepressants in mice, rats or other small laboratory animals that are submitted to an aversive situation.

The aversive situation is induced by suspending the animal by the tail for a short period of time. An animal in that situation alternates between two kinds of behavior: agitation (mobility) and immobility. The cumulative immobility time is a measure of the animal's degree of helplessness ("depression"). Treatment with antidepressant drugs reduces immobility time.

Stand-alone configuration

In the single-channel basic configuration a measuring station consists of:



Sensor mounted to housing

- The ultra-sensitive **Tail Test force sensor** that picks up the animal's movements - complete with mounting hook, tail hanger and connecting cable.
- a special **housing** that isolates the animal from the laboratory routine. The sensor is fixed to the housing roof with two screws, so that the mounting hook is pointing to the floor.
- an **amplifier & filtering unit** with chart recorder output connector for analog output of the movement waveform and digital display of immobility time.

PC-based configuration

For maximum convenience the setup can be connected to a personal computer. The **TSE Tail Suspension software** for Windows allows easy data acquisition then.

The movement waveforms of **up to 16 channels** are displayed in real-time. Time of activity, immobility, and the amplitude in percent of total measuring range are calculated. The calculated parameters are **simultaneously** stored as a CSV file in user-defined intervals for further statistical calculations.

The setup comprises the following components:

- Up to 16 **housings**
- Up to 16 **Tail Test force sensors** complete with mounting hook, tail hanger and connecting cable



- a **control unit** (4, 8 or 16 channels), provided complete with output connector to PC and cable set,



Control unit – 8-channels

- a special control **interface** (PCI slot) and
- the TSE Tail Suspension software package.

The system runs on a Pentium computer with the Windows operating system. The control interface requires one free PCI slot.

Technical data “Mouse system”

Housing	
Dimensions	300 x 400 x 400mm DxWxH
Force Sensor	
Dimensions	19 x 3 x 3 mm (stainless steel)
Rated capacity	600 g (Pond)
Safe overload	300%
Non-linearity	0.02%
Repeatability	0.02%
Hysteresis	0.02%

Preparing the system for an experiment

When the program has been started the following buttons are available on the main screen:



Setup	Opens the Setup window for entering control parameters
File	Opens the File Save dialog window
Start	Starts data acquisition mode
Stop	Stops data acquisition mode
End	Exits the program

Now the user has to check and – if necessary – adjust the **Setup** parameters.

Setup

Display Interval (sec)

Measure Interval (sec)

Output Interval (sec)

Runtime (sec)

Threshold (%)

Enable Boxes

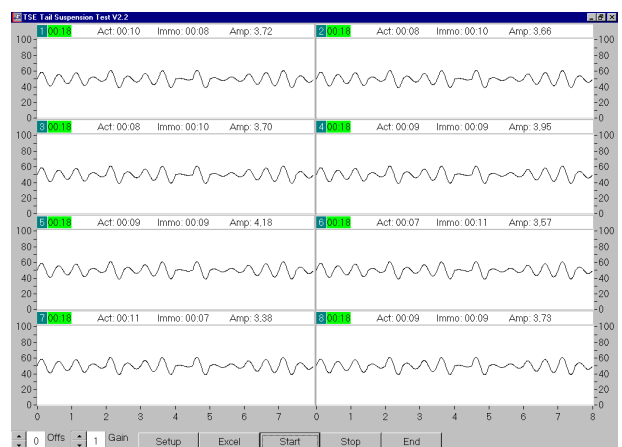
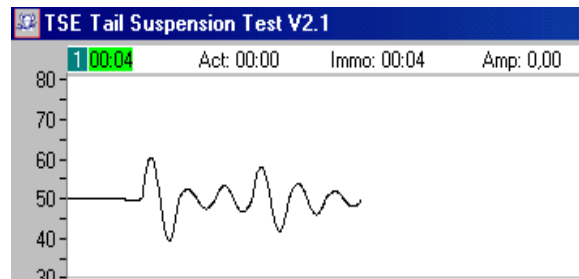
1 2 3 4 5 6 7 8

The following input fields are available for controlling the trial:

- Display Interval** (4...16 sec): X-scale for displaying the curves.
- Measure Interval** (1...8 sec): Time for determining activity or immobility. If the threshold is not exceeded during the measuring interval then this time will be counted as „immobile“. If the level is exceeded then the time is counted as „active“. The next measuring interval then starts.
- Output interval** (sec): Defines how often data are to be transferred.
- Runtime** (10...600 sec): Total running time of a measurement. The measurement begins when the animal is suspended. When the measurement has been concluded the box is stopped.
- Threshold** (0.1...20%): Input for determining activity and immobility. The optimal setting must be determined in preliminary tests.
- Enable boxes:** Unmarked boxes are disabled for the experiment.

Measurement

During a measurement the movement waveform is output. Activity, immobility and amplitude are continuously updated.



A10																			
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
1	24.10.02	14:46:36	sec	1/Act	1/Immo	1/Amp	2/Act	2/Immo	2/Amp	3/Act	3/Immo	3/Amp	4/Act	4/Immo	4/Amp	5/Act	5/Immo	5/Amp	
2			10	6	4	3,67	5	5	3,69	5	5	3,41	5	5	3,74	5	5	4,51	
3			20	4	6	3,78	3	7	3,62	4	6	4,15	6	4	4	5	5	3,71	
4			30	3	7	3,62	5	5	3,71	5	5	3,95	4	6	3,88	6	4	3,61	
5			40	6	4	3,34	3	7	4,8	6	4	3,69	4	6	4,29	6	4	4,01	
6			50	5	5	3,73	4	6	3,59	4	6	4,35	4	6	3,8	5	5	3,81	
7			60	5	5	4,35	6	4	3,8	4	6	3,52	7	3	4,06	6	4	3,81	
8																			

Measuring data – the measuring interval is set to 10 seconds

Partial List of Users

- **Azevan Pharmaceuticals Inc.**
Bethlehem, PA, USA
- **EGIS Pharmaceuticals Ltd.**
Budapest, Hungary
- **Merck Research Laboratory**
Rahway, NJ , USA
- **Neurocrine Biosciences Inc.**
San Diego, CA, USA
- **Shaanxi Normal University**
Xi'an, China
- **Universitätsklinik Hamburg-Eppendorf - UKE**
Hamburg, Germany
- **University of Hawaii**
Honolulu, HI, USA
- **University of Karachi**
Karachi, Pakistan
- **Wadsworth Center**
Troy, NY, USA
- **Weizmann Institute of Science**
Rehovot, Israel

References

Shearman LP, Rosko KM, Fleischer R, Wang J, Xu S, Tong XS, Rocha BA. *Antidepressant-like and anorectic effects of the cannabinoid CB1 receptor inverse agonist AM251 in mice.* Behavioural Pharmacology **2003**; 14(8): 573-582.

Ordering Information

Cat.No.	Description
303590	Tail Suspension System
1. Boxes	
303590-MAU	Tail Suspension Box for Mouse , complete with housing, tail hanger and precise load cell For connecting to amplifier (stand-alone system) or control unit (PC-based system).
303590-RAT	Tail Suspension Box for Rat , complete with housing, tail hanger and precise load cell For connecting to amplifier (stand-alone system) or control unit (PC system).
2. Stand-alone system	
303590-C-A	Tail Suspension Box Amplifier & Monitoring Unit* for 1 Tail Suspension Box (stand-alone system), complete with analog output (for recorder, etc.) and digital display.
3. PC-based system	
a. Control Unit	
303590-C-04	Tail Suspension Control Unit* for connecting up to 4 Tail Suspension Boxes, including PC interface board (PCI slot)
303590-C-08	Tail Suspension Control Unit* for connecting up to 8 Tail Suspension Boxes, including PC interface board (PCI slot)
303590-C-16	Tail Suspension Control Unit* for connecting up to 16 Tail Suspension Boxes, including PC interface board (PCI slot)
b. Software	
303590-S-04	Tail Suspension Software Package for WINDOWS for up to 4 Tail Suspension Boxes
303590-S-08	Tail Suspension Software Package for WINDOWS for up to 8 Tail Suspension Boxes
303590-S-16	Tail Suspension Software Package for WINDOWS for up to 16 Tail Suspension Boxes

* Voltage: 115 or 230 VDC - Please specify with your order.

TSE Systems is a leading supplier of sophisticated research instrumentation in the global life science market. Our focus is on providing the total customer solution, with modular designs of integrated hardware and software platforms for neuroscience, metabolic and behavioral phenotyping, drug screening and toxicology.

For further information please contact us.

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