Startle Response & PPI System

For Small Laboratory Animals

Mouse restrainer on sensor platform

Fully equipped stimulus base unit

Restrainer, sensor platform & stimulus base unit in sound-attenuating housing
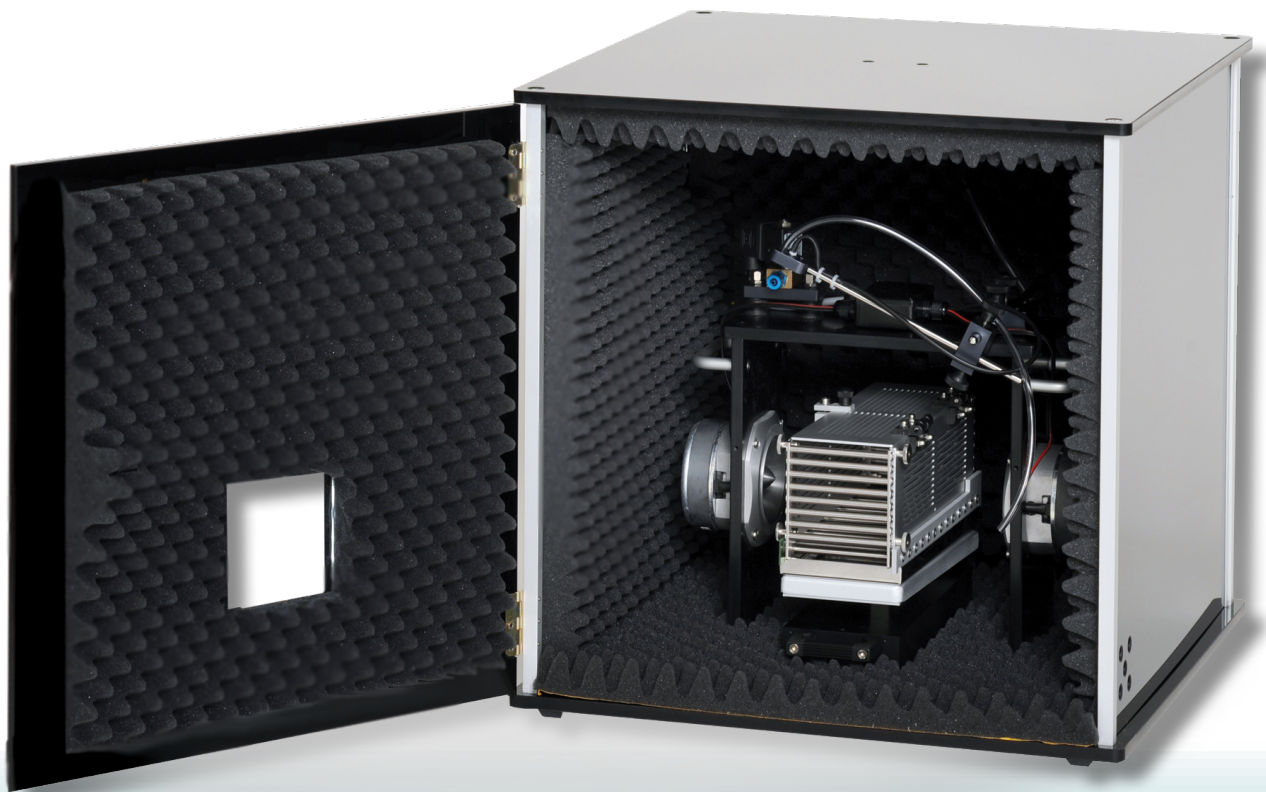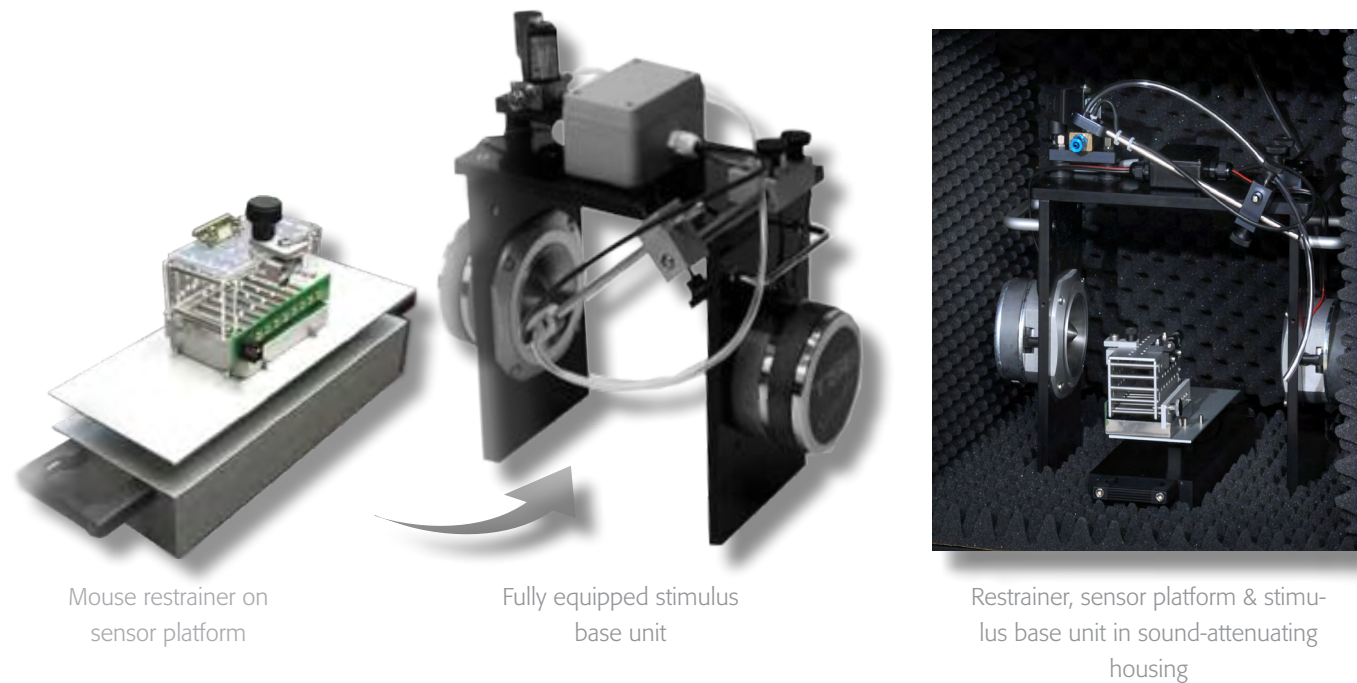
Startle Response & PPI System: Hardware

The fully computerized TSE Startle Response & PPI (pre-pulse inhibition) test system is designed for accurate and reliable determination of the startle reflex and investigation of sensorimotor gating in rodents, for example in schizophrenia models. In PPI experiments a weak pre-pulse is followed by the startle stimulus leading to a reduced startle response.

System Components
- Animal restrainer with shockable floor
- Sensor platform
- Stimulus base unit
- Sound-attenuating housing
- Control unit
- TSE Startle Response & PPI software package
- **Note:** Several Startle boxes can be operated simultaneously to allow high-throughput experimentation

Animal Restrainers
- Species-specific for rats & mice
- Made of aluminum & transparent plastic
- Opens comfortably towards top
- With shockable stainless steel floor grid
- **Shock Module**: an electric current can be applied through the floor grid to evaluate fear-potentiated startle, usually the shock is paired with a light stimulus; constant or pulsating currents possible (0.1...3.1mA)
- With excrement tray below floor grid, easily removable for cleaning

Sensor Platform
- Species-specific for rats & mice
- Highly sensitive calibrated force sensor plate
- Mounted on an ultra stable base construction
- Registers dynamic changes irrespective of animal weight

Stimulus Base Unit
- Equipped with loudspeakers, air puff unit & stimulus LED light
- **High-linearity speakers** produce both sine sound (4 - 20 kHz) & white noise with user-defined intensity (up to 130 dB) with rapid rise times & stable amplitude
- **Air puff** valve on a flexible arm can be brought to any position
- **LED** light on the flexible arm delivers visual stimuli

Sound Attenuating Housing
- Highest standardization of experimental conditions
- Fan provides fresh air
- House light with manual on / off switch
- Front door with inspection window

Startle Response & PPI System: Software

The flexible software package allows the creation of user-defined test protocols. Reaction time, i.e. response latency, and startle amplitude for each trial are presented in results tables. Graphs allow the performance of several animals to be compared.

Experimental Settings

TRIAL DEFINITION OPTIONS	
EVENT	**SETTINGS**
Sine Sound	Start, Duration, Intensity (dB), Frequency (Hz)
Noise	Start, Duration (ms), Intensity (dB)
Light	Start, Duration (ms)
E-Shock	Start, Duration (ms), Intensity (mA), Pulsed or Constant
Air Puff	Start, Duration (ms)
TTL Signal	Start, Duration (ms) of external devices, e.g. a camera
Acquisition	Duration of Acquisiton Time (ms)
Intertrial	Duration of Intertrial Interval (ms)

- Single trials are defined as a combination of event settings (e.g., the Pulse only, Prepulse only, Pulse & Prepulse, etc. trials are defined in terms of their duration and intensity)
- Animal information (e.g. ID, gender, group) can be entered
- A series of trials in fixed or randomized order can be combined and animals be assigned to experiments
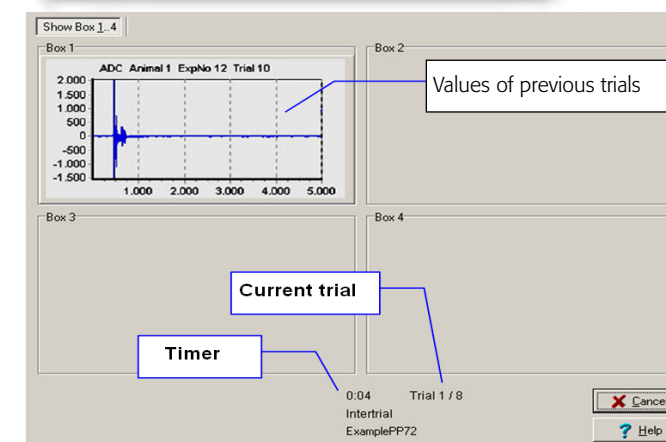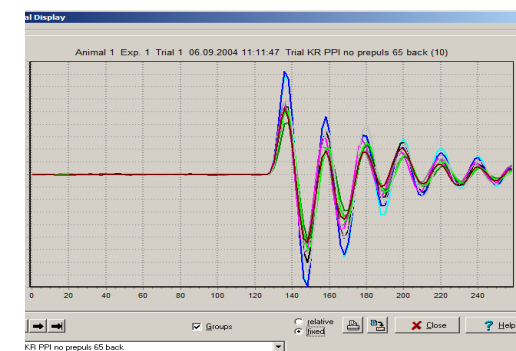
Trial Monitor
- Live view of trial status and active stimuli in all activated boxes
- Immediate display of startle response waveforms

Graphical Displays
- A data selection screen shows the trials of all animals; the user chooses the data records of interest
- Single or multiple (overlayed) trials can be represented per graph showing the change in force over time
- Graphs can be saved as picture .bmp file or ASCII file or can be printed

Result Tables
- Tables show single trial values, as well as mean or median values for groups of identical trials (startle latency, startle duration, max. startle amplitude, latency to max. startle amplitude)
- Calculation of startle response values is influenced by trigger thresholds, which are automatically calculated by the system during the calibration phase or are user-defined
- Data can be exported for further statistical analyses in form of .csv files

Animal No.	4
Group	black
Strain	ORR
Age	160
Weight	
Trial No.	1
Exp. No.	1
Code	
Operator	
Comment	
Substance	
Dose	
Baseline	Recorded
Date	06.09.2004
Start Time	11:32:00
ADC-Interval	2 ms
Trigger	1,0 g (Trigger from Baseline Phase * 2,0/ min. 1,0 g)
max. Delay	20 ms
Maximum within Storage Window	

Trial	Reaction ms	Duration ms	Maximum g	Maximum ms
KR PPI 75 dB constant 65 back				
1	130	100	6,4	146
3	132	68	4,1	148
5	130	126	8,2	136
8	132	70	5,2	146
12	136	18	1,7	148
29	134	20	2,5	146
31	144	96	2,5	168
35	134	84	2,6	138
36	154	2	1,1	154
40	158	12	1,4	166
Mean	138,4	59,6	3,6	149,6
KR PPI no prepuls 65 back				
2	130	116	12,7	136
7	130	120	9,3	136
15	144	72	3,7	148
16	132	108	6,6	138
17	164	2	1,0	164
18	132	86	3,9	146

Values of previous trials

Current trial

Timer

Recent Publications

2017

- **Amato D, Canneva F, Nguyen HP, Bauer P, Riess O, von Hörsten S, Müller CP.**
  Capturing schizophrenia-like prodromal symptoms in a spinocerebellar ataxia-17 trans genic rat. Journal of Psychopharmacology 2017; 31(4): 461-73

-

Service & Warranty

TSE Systems offers a Two (2) Years ALL-IN Premium Warranty with all new products, including:

- 24/7 technical hotline
- Remote maintenance and update function
- On-site visits upon necessity
- Free replacement parts during warranty

After the expiry of the warranty period, TSE Systems offers comprehensive extensions of the warranty or economical maintenance and repair contracts to ensure the continued smooth running of your instruments. Please contact us for further details.

www.TSE-Systems.com   Info@TSE-Systems.com