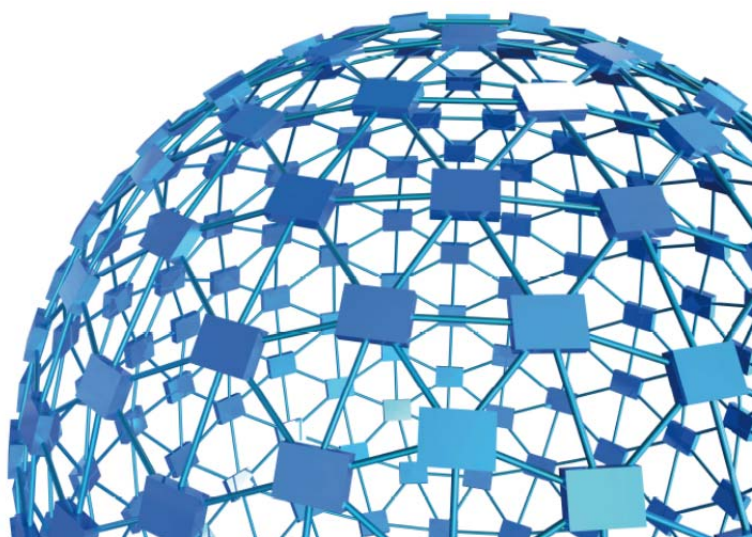




**ugo basile<sup>®</sup>**

# instruction manual

**Passive Avoidance Set-Up  
Cat. No. 40550**



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**instruction manual**

**Passive Avoidance Set-Up  
Cat. No. 40550**

**Serial No.**

## SAFETY CONSIDERATIONS

ALTHOUGH THIS INSTRUMENT HAS BEEN DESIGNED WITH INTERNATIONAL SAFETY STANDARD, THIS MANUAL CONTAINS INFORMATION, CAUTIONS AND WARNINGS WHICH MUST BE FOLLOWED TO ENSURE SAFE OPERATION AND TO RETAIN THE INSTRUMENT IN SAFE CONDITIONS.

SERVICE AND ADJUSTMENTS SHOULD BE CARRIED OUT BY QUALIFIED PERSONNEL, AUTHORIZED BY UGO BASILE ORGANIZATION.

ANY ADJUSTMENT, MAINTENANCE AND REPAIR OF THE OPENED INSTRUMENT UNDER VOLTAGE SHOULD BE AVOIDED AS MUCH AS POSSIBLE AND, WHEN INEVITABLE, SHOULD BE CARRIED OUT BY A SKILLED PERSON WHO IS AWARE OF THE HAZARD INVOLVED.

CAPACITORS INSIDE THE INSTRUMENT MAY STILL BE CHARGED EVEN IF THE INSTRUMENT HAS BEEN DISCONNECTED FROM ITS SOURCE OF SUPPLY.

## Passive Avoidance Step-Through *New Model*

Cat. No. 40552 Rats

Cat. No. 40553 Mice

### General

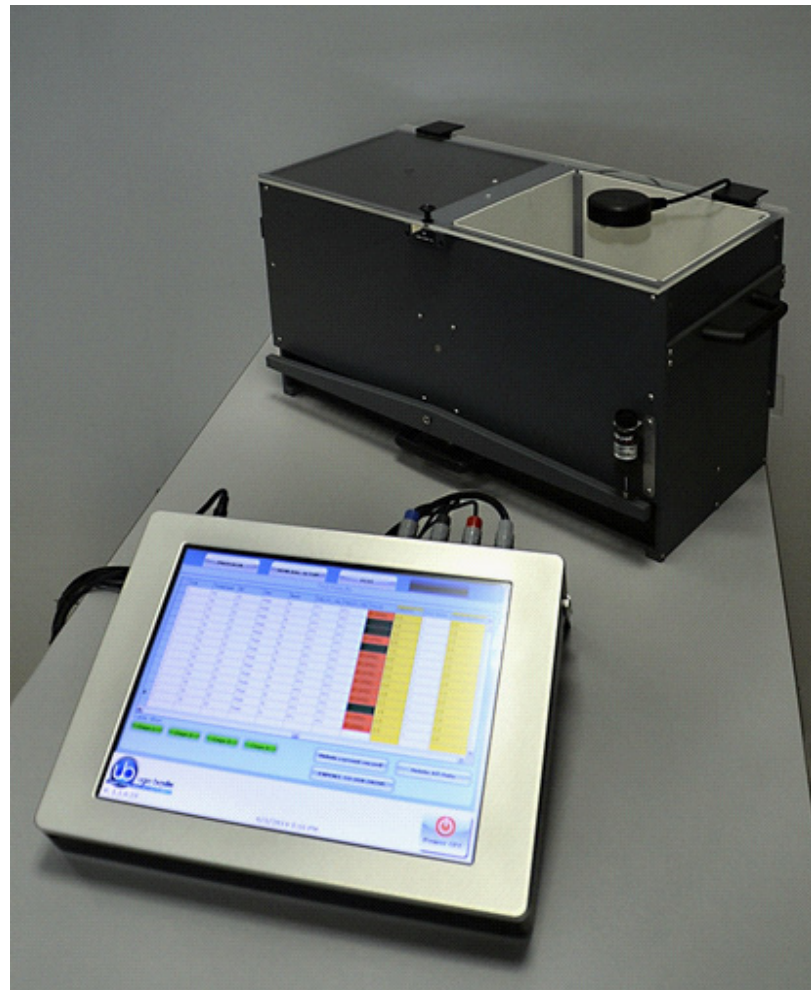
**Passive Avoidance Test** is used to assess memory function based on the association formed between a specific environmental context, which the animal learns to avoid, and an aversive stimulus, represented by a mild foot shock.

The tests are conducted in a two-compartment apparatus, where one is dimly lit and preferable to a rodent, and the other is brightly lit.

After the training period, during the test proper, the animal that learned the task will avoid the location previously paired with the aversive stimulus, and show greater latency to enter it.

Ugo Basile Passive Avoidance set-up instrument basically consists of a Controller, and a Cage divided into two compartments by a partition which embodies a sliding door.

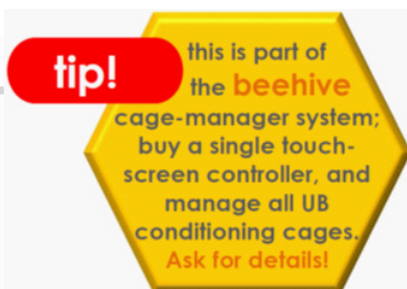
The tilting floor ensures a simple and reliable detection mechanism to score the animal's movement across the two compartments.



Step-Through Cage

Multiple-Cage Set-up

EFFICIENT, RELIABLE  
INSTRUMENT FOR  
THE CLASSIC PASSIVE  
AVOIDANCE TEST



### Main Features

- The electronic unit encompasses all controls for **up to 4 animal cages!**
- **Silent and automated sliding door** to divide the two compartments (no stepping motor!)
- **Reliable tilting-floor detection mechanism**

### NEW on the 2014 version!

- The new "launcher" application, makes it possible to manage other UB behavioral cages with the same **Touch-Screen Controller 40500-001**; just purchase the hardware and the application software for the additional test!
- **Remote Control feature** will make remote service and software upgrades extremely simple!



ugo basile®

# CHECK-LIST

## Cat. No. 40550 Passive Avoidance Set-Up

CLIENTE / CUSTOMER \_\_\_\_\_

Ordine No. / Order No. \_\_\_\_\_ Data / Date \_\_\_\_/\_\_\_\_/\_\_\_\_

UB code	CAT.No.	✓	Q.ty	DESCRIPTION	DESCRIZIONE		
	40500-001		1	CONTROLLER & SHOCKER	UNITÀ CONTROLLO CON SHOCKER		
	40550-010	✓		SOFTWARE ACTIVATION	SOFTWARE E ATTIVAZIONE		
<b>↳ IMPORTANT: SOFTWARE IS PRE-INSTALLED ON 40500-001</b>							
	40552		1	P.A. RAT CAGE	GABBIA P.A. RATTO		
	40553		1	P.A. MOUSE CAGE	GABBIA P.A. TOPO		
E-AU 041 USB pen-drive	40550-302		1	INSTRUCTION MANUAL	MANUALE DI ISTRUZIONE		
	52010-323		1	USB CABLE	CAVO USB		
E-AU 074			1	POWER SUPPLY	ALIMENTATORE		
E-WP 008				MAINS CABLE	EUROPE	CAVO RETE	EUROPA
E-WP 008-1					U.S.A.		U.S.A.
<b>OPTIONAL (MULTIPLE CAGES)</b>							
	40500-005		1	EXPANSION BOX	BOX ESPANSIONE		
	40552			ADDITIONAL P.A. RAT CAGE/S	GABBIA P.A. RATTO AGGIUNTIVA		
	40553			ADDITIONAL P.A. MOUSE CAGE/S	GABBIA P.A. TOPO AGGIUNTIVA		

DATE / /	Serial No.	IMBALLATO DA / PACKED BY
Universal Input 85-264 VAC, 50-60Hz		

### IMPORTANT/IMPORTANTE:

Check the shipment for completeness immediately after receipt: should you find any discrepancy, please fill in the following part and transmit it to our fax no. +39 0332 745488

Al ricevimento della merce controllate che la spedizione sia completa: in caso di discrepanza, completate il formulario di seguito riportato ed inviatelo al nostro fax no. 0332 745488

FROM: Name	Company/Institution
DATE	REF.

NOTE

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# Passive Avoidance Set-Up (Step-through)

Cat. 4 0 5 5 0

## 1 GENERAL

Behavioral scientists are well acquainted with passive avoidance methods that have been used for several decades, originally by psychologists, who were interested in animal behavior.

These procedures were later exploited by neuroscientists, who specifically perform systematic studies of the behavioral changes mainly produced by brain lesions, to define the functions of different C.N.S. sections.

The Passive Avoidance was soon extended to several other areas of research such as behavior genetics, psychopharmacology and behavioral toxicology. More recently, such use has become routine in animal model studies of aging and of Alzheimer-type dementia, including the search for new drugs of potential therapeutic value, consisting of attenuation of behavioral deficits.

The **Passive Avoidance** task is a **one trial fear-motivated avoidance task**, classically used to assess short-term or long-term memory on small laboratory animals (rodents).

### 1.1 Principle of Operation

P.A. tests are conducted in a two-chamber cage, where one is dark, and preferable to a rodent, and the other is brightly illuminated; the two compartments are separated by an automatic sliding door. The cage incorporates an electrified grid floor.

After an initial habituation, in which the animal is left to explore the cage, during the training phase the rodent learns to refrain from stepping through a door to the apparently safer dark compartment, due to the association of the dark compartment with an aversive stimulus, represented by a mild foot shock.

Basically, passive avoidance working protocols involve timing of transitions, i.e. time that the animal takes to move from the white compartment to the black one after a conditioning session, in which the entry into the black compartment is punished with a mild inescapable electrical shock is carried out.

See the following flow-chart, describing the P.A. test.

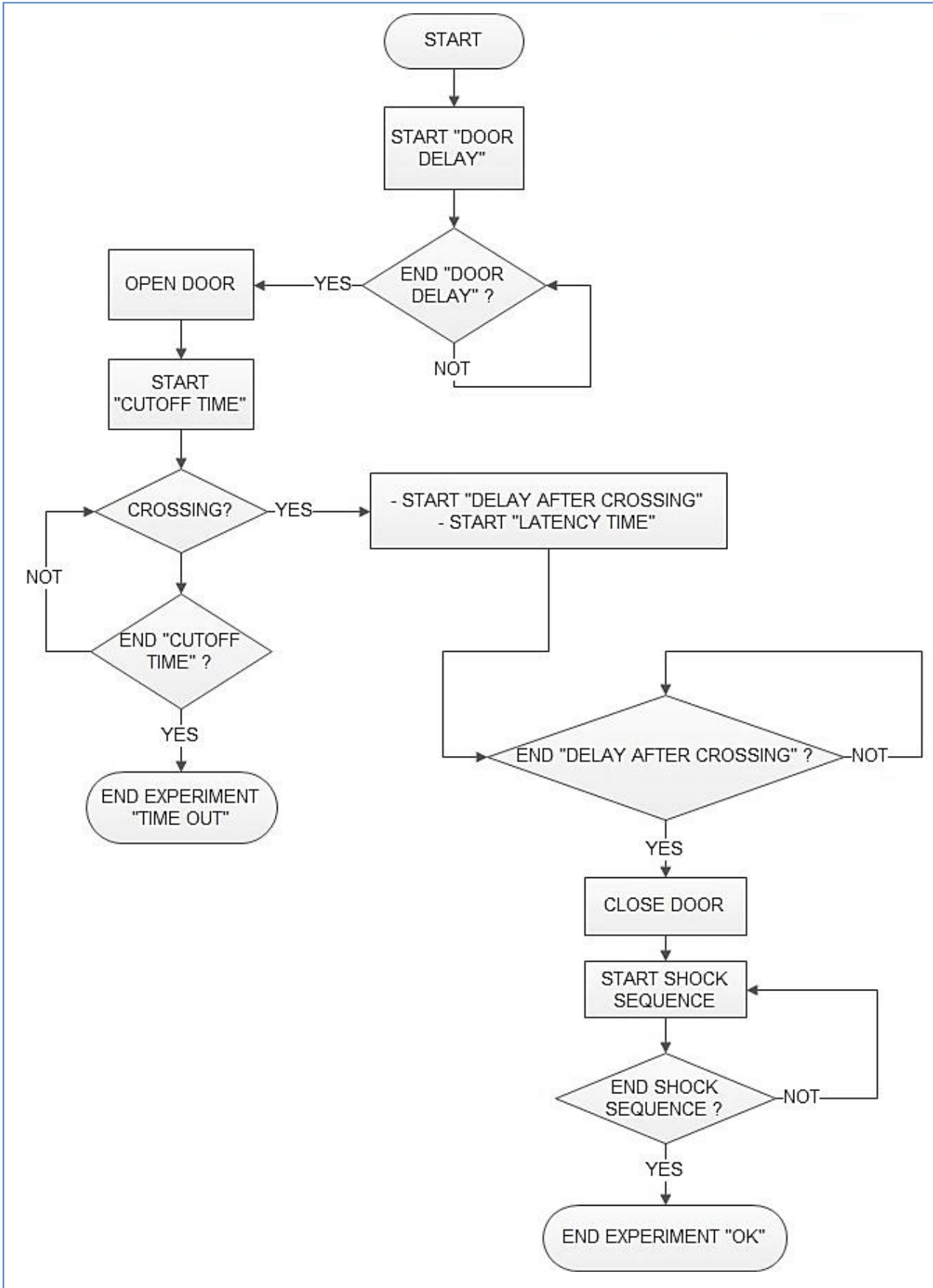


Figure 1 "P.A. Flow-Chart"



## 2 INSTRUMENT DESCRIPTION

The Passive Avoidance Set-Up (step-trough method) by Ugo Basile is an efficient and reliable instrument for the classic Passive Avoidance Test, designed so as to maximize versatility, besides ensuring reliability of functions and therefore reproducibility of the results.

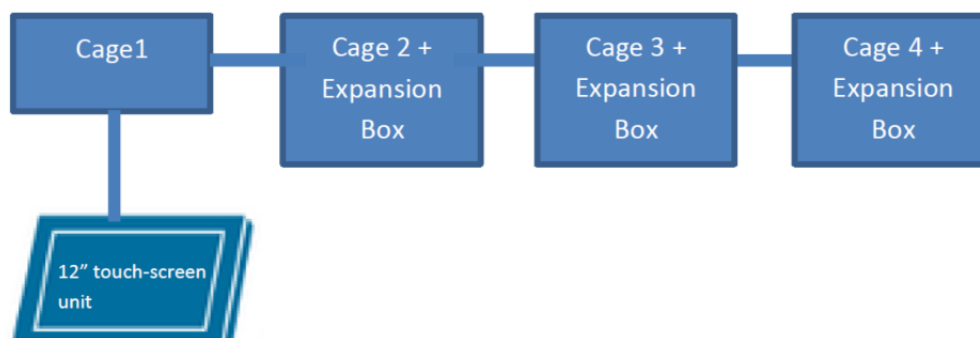
The experimenter can easily vary critical parameters according to her/his needs, at the same time, being confident that possible confounding variables, such as the noise produced by moving parts of the apparatus, have been made absolutely negligible.

### The instrument basically consists of:

- **40500-001** 12" Touch-Screen Controller, encompassing a precision 8-pole shocker
- **40550-010** P.A. Software (installed on the Controller)
- **40552** Rat Cage  
or
- **40553** Mouse Cage

Multiple configurations (up to 4 cages) can be controlled by the new electronic unit via the:

- **40500-005** Expansion Box, according to the following configuration:



### 2.1 P.A. Controller

The **Programming/Recording Unit**, consolidates all controls and incorporates a constant-current high precision 8-pole shocker, in a single, compact electronic unit, of attractive design.

The **40500-001 Touch-Screen Controller** is a powerful and versatile tool, which will function as main unit in a number of tests:

- a. Fear Conditioning - available (see 46000-100)
- b. Passive Avoidance - available
- c. Passive Step Down - available

- d. Active Avoidance - available
- e. Learned Helplessness - available
- f. Startle/Response - available soon

For each test, a specific application software is available for installation. Each software is sold separately, so it is easy to customize each controller according to the experimental needs.

The application “**Launcher UB**” is installed on the 12” touch-screen (TS12).

When starting the system, the following screen will appear:

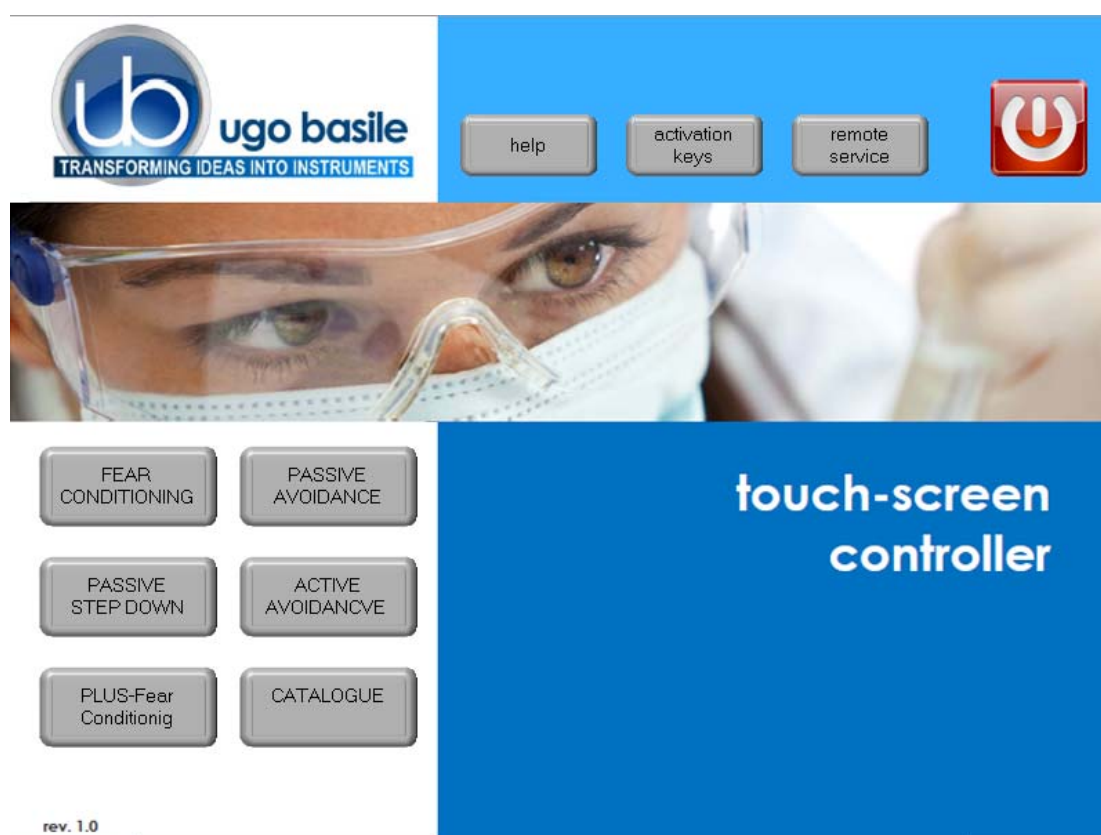


Figure 2 “Launcher”

The bottom left section of the screen shows the available applications, which appear as buttons, labelled with the name of the related test.

The color of the button indicates the application status, according to the following scheme:



Light grey: software installed, but not enabled, it is necessary to enter the activation key



Dark Grey: software installed and active: press the button to run the application software.

The 12" touch-screen unit manages the Passive Avoidance Test via the **40550-010 Software** (which comes pre-installed on the controller, when the touch-screen and the cage are purchased together).

In case an application software is not active it is necessary to enter the activation key.



**Also refer to the help section on the launcher menu on the Controller Unit.**



Having run the P.A. application software, the 40500-001 becomes the main Controller Unit to perform Passive Avoidance Tests for Rats and Mice, with single or multiple cage setting.

Up to 4 cages can be connected to the same Controller; if more than one cage is connected, an expansion box 40500-005 is required for each additional cage.

The P.A. Controller also manages data acquisition: data are stored inside the unit and can be downloaded via the USB key provided as standard, for further processing via Excel, Access, etc.

The test parameters can be set easily, with a quick touch of the screen: parameters can be adjusted with an easy and intuitive approach.

Protocols can be loaded, saved, imported or exported and deleted with just one touch.



Figure 3 "Controller"

The timeline of the experiment can be also displayed, as well as the test results and input data.

The example shows the timeline while the test is in progress.

Each event can be easily monitored during the entire course of each test.

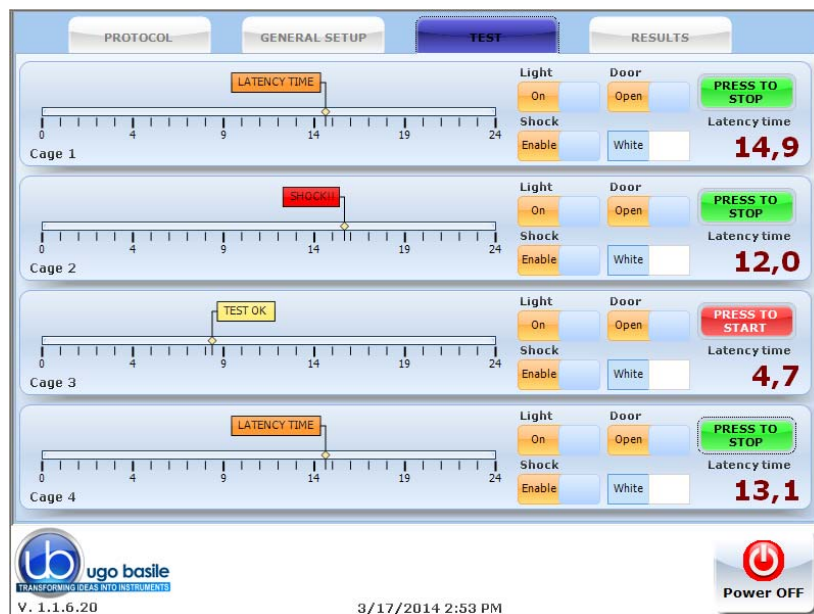


Figure 4 "Timeline"

## 2.2 Passive-Avoidance Cage (step-through)

Two types of cages, of new design, are available:

- **40552** designed for Rats dimensioned 57x27x30(h)cm, I.D. 48x20x22(h)cm
- **40553** designed for Mice dimensioned 47x18x25(h)cm, I.D. 38x9x17(h)cm

The cage is divided into two sections, the START and ESCAPE compartments. The start compartment is white and illuminated by a light fixture (white-light LED based repositionable light source); the escape compartment is dark and its grid floor is connected to the shocker.

The tilting floor ensures a simple and reliable detection mechanism to score the animal movement across the two compartments; a new adjustable cushion system ensures a smoother tilting control.

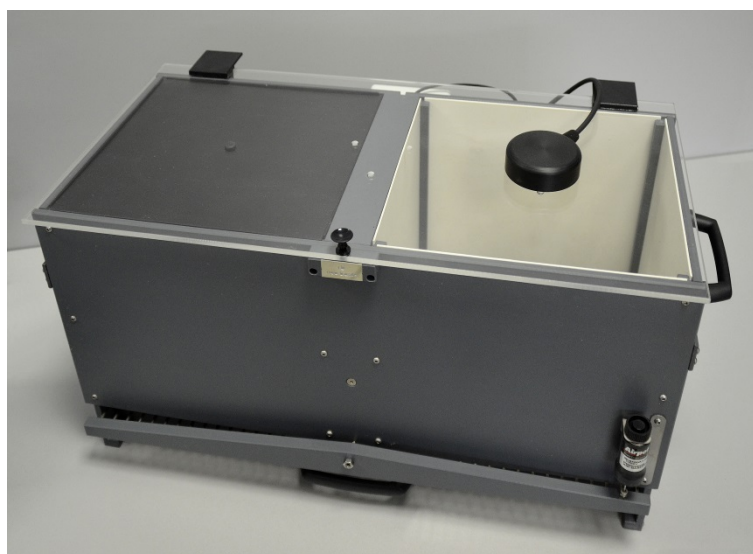


Figure 5 "Rat Cage 40552"

The two compartments are divided by a partition which embodies a silent, automated sliding-door at floor level. The door delay and the shock parameters can be preset on the



touch-screen of the controller, according to experience or data suggested by the literature.

With the rodent in the START compartment, the START button activates the timer, providing the **opening of the door** after the preset delay.

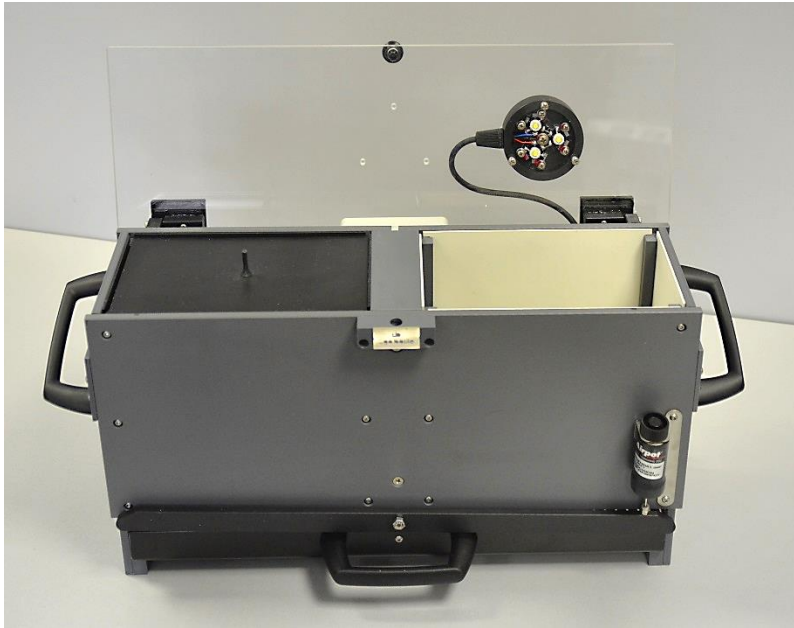


Figure 6 "Mouse Cage 40553"

The opening of the door enables the **latency timer**, which stops at the animal crossing; latency time is displayed in 0.1s steps. The door shuts one second after the crossing, to prevent the animal being upset or hurt by a too close door operation.

An adjustable **pneumatic damper** is provided to prevent rattling of the tilting floor, caused by any rough movement of the rodent.

The Cage is provided with a **catch pan** of Nylon coated aluminum which slides in, on two side rails, below the floor grid.

### 2.2.1 Sliding Door

This is a two-wing sliding door, elevator type, made of low density cellular PVC, actuated by a moving coil arrangement of original design.

The doors are extremely silent in operation; the combination of low mass, damping support blocks, absence of backlash, no stepping motor, ensures a practically noiseless operation.

## 3 INSTALLATION

### 3.1 Unpacking & Preliminary Check

Check the contents of the shipment for completeness, packing list to hand, and visually inspect the instrument as soon you take it out of the packaging. Use the supplied **Check List**.

If the instrument is damaged, inform the carrier immediately, notifying our company. If after having tested it, the P.A. set-up fails to meet rated performances, please contact our after sales service, see paragraph 5.6-Customer Support.



### ***Protect the environment!***

Dispose of packaging properly, according to existing and applicable waste management rules and regulations.

## **3.2 Notes on the Instruction Manual**

The 40550 Instruction Manual included in package (on the USB pen-drive) is necessary for the correct installation and operation of the instrument.

We recommend reading the manual with attention, as it is essential for the correct installation and operation of the instrument.

Please save the manual, ready to be consulted by the qualified personnel who use the instrument. Print it, only if necessary.

Our Instruction Manuals are available as free download on our website.

For any additional information and/or assistance, you are welcome to contact our Service Department (see paragraph 5.6-Customer Support), specifying the serial number of the instrument.

## **3.3 Assembling the Instrument**

Assemble the Passive Avoidance Set-Up on a stable bench or table surface. Once the P.A. set-up is assembled, do not attempt to lift or move the combined unit; remove the connections first.

The Cage should be placed on a stable horizontal board. If the Cage structure is twisted, this can cause the floor to seize and result in incorrect operation. Ensure that the Cage floor tilts freely, after having removed all packing material. Remove the sponge-rubber block to free the sliding door.

## **3.4 Recommended Operating Condition**

Place the P. A. Apparatus in a room which is acoustically isolated or at least remote from sudden or intense noises.

The room should not be illuminated too brightly. In particular, avoid direct light on the Cage, e.g., from a table lamp.

Temperature is an important factor since below 18-20°C the rodents sometimes react less promptly to stimuli. Optimum temperature is 22-25°C.

## **3.5 Setting-Up a Basic System**

Setting-up a Standard System consists in the installation of:



- Animal Cage 40552 or 40553
- Touch-Screen Controller 40500-001 (with preinstalled software 40550-010)

### 3.5.1 Connections

Observe the back panel of the Touch-Screen Controller:



Figure 7 "Controller, Back Panel"

And the same back panel, with all connections:

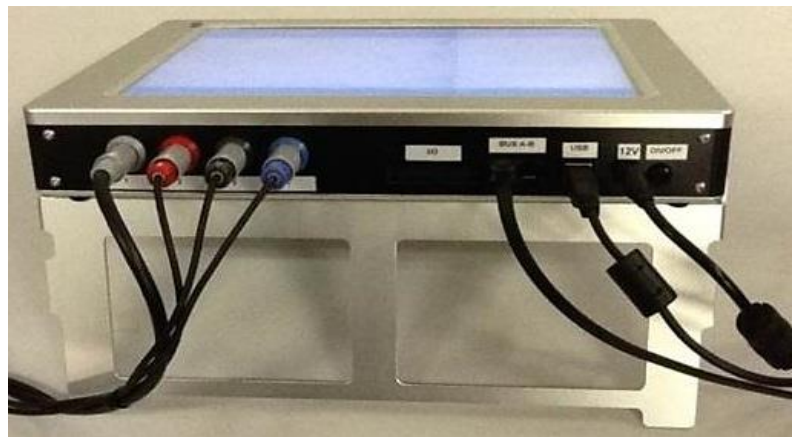


Figure 8 "Controller, Connections"

- **Connectors 1 to 4** go to cage 1 via the connectors provided on the junction box of cage 1. Possible mismatching is prevented by color coding:
  - **Connector 1** (grey color): shock
  - **Connector 2** (red color): light
  - **Connector 3** (black color): sound
  - **Connector 4** (blue color): door-switch & floor tilt status
- **BUS A-B** is the communication cable, which goes to the second cage (first expansion-box), and from there to third and fourth cage in a daisy-chain.
- **12V** for the power supply

### 3.5.2 Connection of Main Unit and Expansion Box/es

Connections are arranged as follows on the back panel of the CAGE 1:



Figure 9 "Expansion Box Connections"

On the back panel of the  cage 2  (expansion 1) and  cage 3  (expansion 2), connections are arranged as follows, from left to right:

- Power supply
- Communication cable coming from the previous cage
- Communication cable going to the following cage

4 connectors to cage, with same color code as described in paragraph 3.5.1.

### 3.5.3 P.A. Software

The P.A. software is preinstalled on the controller, when the cage and the main unit are purchased together; the software version appears on the bottom left corner of the screen, below the Ugo Basile Logo (see paragraph 4.1).

If the software is not active, enter the activation key, following the instructions on the HELP section of the launcher application, see also paragraph 2.1)

When a new PA software version is available, it may be uploaded via the "**Update Application**" button (see paragraph 4.3.1.1).

## 3.6 Intended Use

The P.A. Set-Up is intended for investigation use on laboratory animals only.


## 3.7 General Safety Instructions

The following guidelines must be followed to ensure safe operation.

- ! **DO NOT** attempt to open or perform any service work
- ! **DO NOT** connect up human subjects



### 3.8 Additional Safety Consideration

- a. The cage floor is electrified; use maximum care and always use rubber gloves when handling the cage, to position/remove the animal, or the catch pan. 
- b. Use original accessories and spare parts only, see also paragraph 6-ORDERING INFORMATION
- c. Do not operate the instrument in hazardous environments or outside prescribed environmental limitations (i.e. +18C°/+24C°, 60% relative humidity, non-condensing);
- d. Do not spray any liquid on the connectors;
- e. Keep inflammables far from the instruments.

**UGO BASILE DOES NOT ACCEPT ANY RESPONSIBILITY FOR PROBLEMS OR HARM CAUSED TO THINGS OR PERSONS, ARISING FROM:**

- incorrect electrical supply;
- incorrect installation procedure;
- incorrect or improper use or, in any case, not in accordance with the purpose for which the instrument has been designed and the warnings stated in the instruction manual supplied with the instrument;
- replacement of original components, accessories or parts with others not approved by the manufacturer;
- servicing carried out by unauthorized personnel

see also paragraph 5-MAINTENANCE.

## 4 OPERATION

### 4.1 Switching-On

The touch-screen controller is switched ON by pressing the ON/OFF' button located on the back panel, see Figure 6 "Controller, Back Panel".



Start the P.A. application software by the related button on the launcher menu.



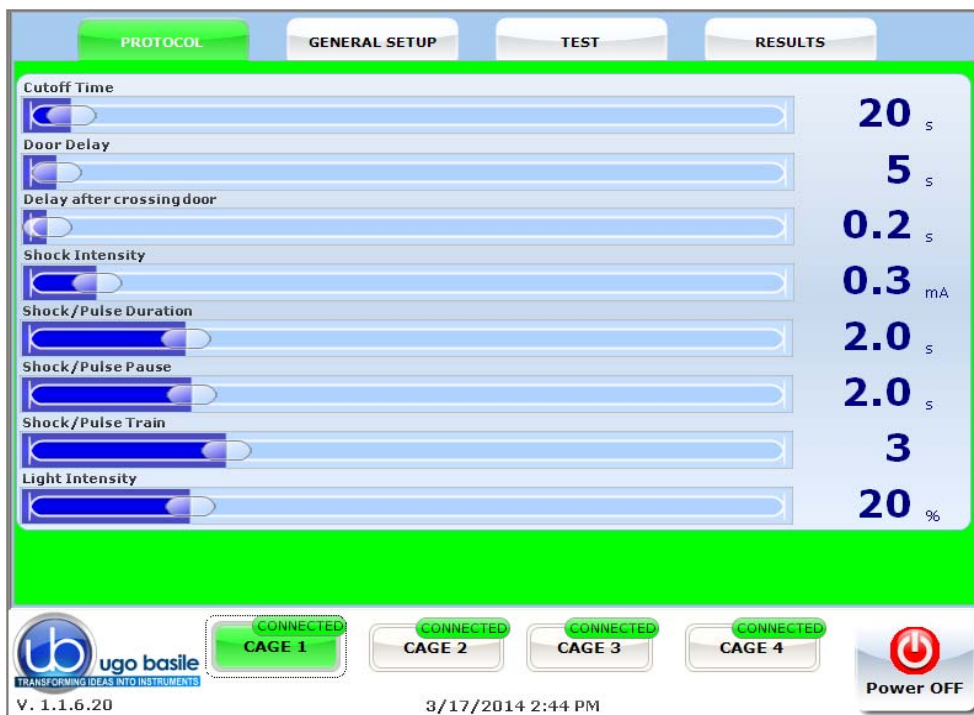


**Also refer to the help section on the launcher menu on the Controller Unit.**



## 4.2 PROTOCOL Window

When opening the P.A. program, the PROTOCOL window will appear, from which the user can set the protocol parameters.



*Figure 10 "PROTOCOL Window"*

The window also shows, on the bottom row, how many cages are connected:



The above example considers a system of 4 cages: the four virtual keys, with the caption



confirm that the connection is correct and that communication between the devices is operational.

The software version appears on the bottom left corner, below the UB Logo (in this example 1.1.6.20). This information is useful in case after sales assistance is required.

The following parameters can be preset from the PROTOCOL window (see Fig. 4):

- **Cutoff Time:** sets the maximum trial duration (presettable from 0 to 600 sec)
- **Door Delay:** sets the interval between the start of the trial and the opening of the door dividing the lit and the dark compartment (presettable from 0 to 300s)
- **Delay after Crossing Door:** sets the time the door remains open to enable the animal crossing (presettable from 0 to 3s, in steps of 0.1s)
- **Shock Intensity:** defines quantity of current during the shock (presettable from 0 to 3.0mA)
- **Shock/Pulse Duration:** defines the duration of the electric stimulus (presettable from 0 to 9.9s)
- **Shock/Pulse Pause:** sets the pause between two subsequent shock events (presettable from 0 to 9.9s)
- **Shock/Pulse Train:** sets the number of electric stimuli during the trial (presettable from 0 to 9)
- **Light Intensity:** sets the light flow inside the cage as follows:
  - Mouse Cage: presettable from 0 to about 1800lux (measured at grid level)
  - Rat Cage: presettable from 0 to about 1400lux (measured at grid level)

It is possible to modify the value of each parameters in two different ways:

- by **sliding the cursor** on the bar  
or
- by double-clicking the bar, and **entering the desired value** on the small keyboard appearing on the screen.

A different protocol can be preset for each cage: first of all, select the cage by pressing the related virtual key.

Each cage is identified by a different frame color:

- **green** for cage **1** (see Figure 4)
- **yellow** for cage **2**
- **purple** for cage **3**
- **blue** for cage **4** } (see following examples)



### 4.3 GENERAL SET-UP Window

By pressing the GENERAL SETUP label, at the top of the window, you access a new page, where you can define other parameters of the test protocol (see Figure 6 below).

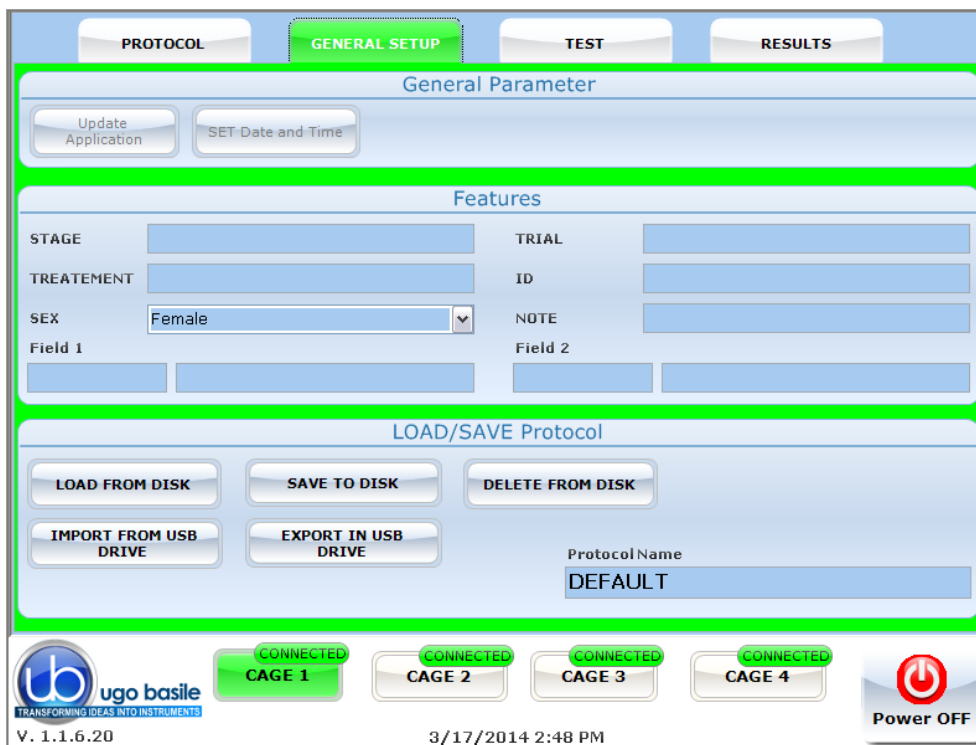


Figure 11 "GENERAL SET-UP Window"

This page is divided into three sub-sections:

- General Parameter
- Features
- LOAD/SAVE Protocol

The above options are described in detail in the next paragraphs.



### 4.3.1 GENERAL PARAMETER

#### 4.3.1.1 Update Application

When a new PA software version is available, you may upload it via the "**Update Application**" button.

Having received the file with the new version (e-mail or FTP), follow the steps below to install it on your controller unit:

- 1) Copy the new file "*Passive.exe*" on the root of a USB key
- 2) Insert the USB key and, if necessary, wait for the touch-screen controller to recognize the peripheral
- 3) Press "Update Application"
- 4) If the USB key is recognized, the UPDATE APPLICATION window will appear



- 5) Pressing "UPDATE APPLICATION" will start the file copy
- 6) The process will be confirmed by the caption "Updated Successfully"
- 7) The new SW will start automatically; you can verify the update by reading the new version at the bottom left corner, below the UGO BASILE logo.

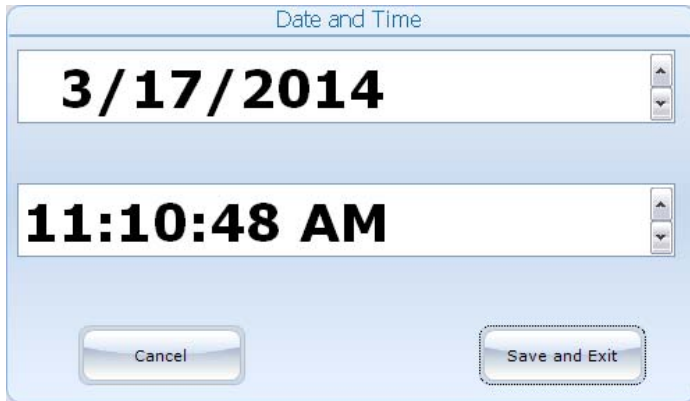


#### **NOTES:**

- It might be necessary to repeat action 5) more than once.
- If the USB key is not recognized, the following warning will appear: "USB DRIVE NOT PRESENT!!!"

### 4.3.1.2 Set Date and Time

By selecting “Set Date and Time”, the following window will appear:



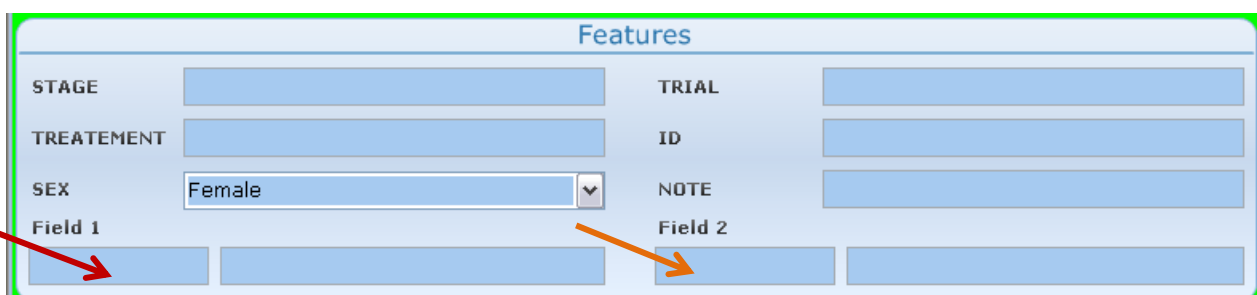
Select the value to be modified, by pressing it, then change it via the arrows on the right.

Then select “Save and Exit” to save the new parameters (or “Cancel”, if you do not wish to save the change) to go back to the GENERAL SETUP menu.

### 4.3.2 Features

This section includes several text fields, all editable (except “gender”), which will enable the user to personalize the basic datum, by adding the following information:

- **STAGE:** indicating the number/name of the test
- **TRIAL:** indicating an trial number/name
- **TRETEMENT:** indicating the type of treatment
- **ID:** animal identification (number/name)
- **GENDER:** animal gender
- **NOTE** to enter general comments
- **Field 1:** this is an additional descriptive field. Entering a label in the first field (indicated by the red arrow in the picture below) will automatically rename the related column in the Excel database which will be generated. The new name will be common to all cages
- **Field 2:** this is a second additional descriptive field. Entering a label in the first field (indicated by the orange arrow in the picture below) will automatically rename the related column in the Excel database which will be generated. The new name will be common to all cages

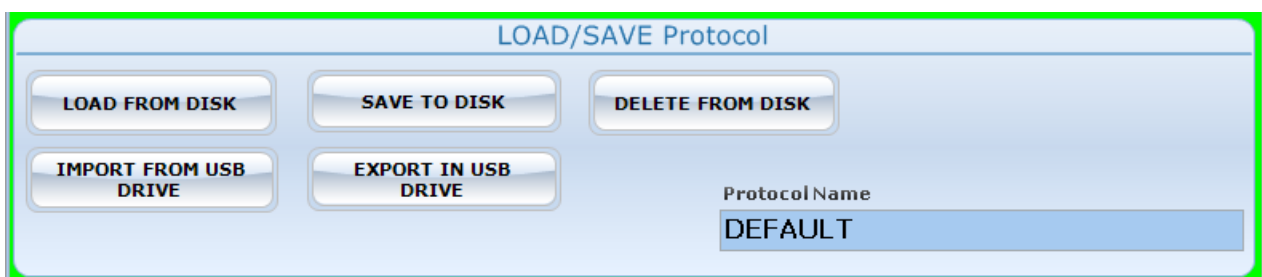


Every field can be edited by pressing the same, and entering the data on the virtual keyboard which appears on the screen.

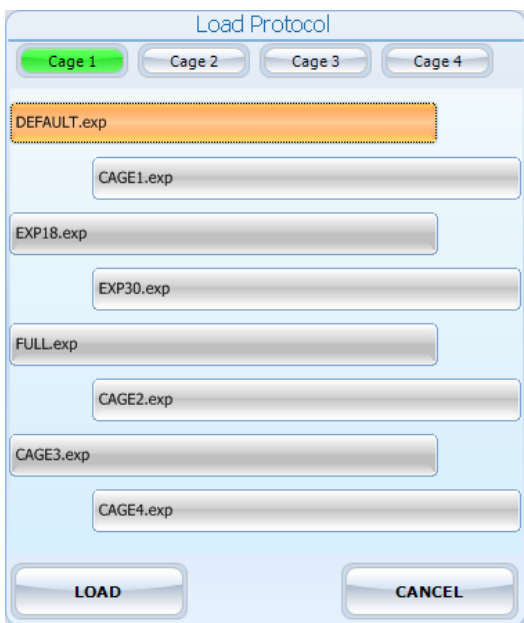
Each information will appear in a different column within the RESULTS table (see paragraph 4.6-RESULTS Window).

### 4.3.3 LOAD/SAVE Protocol

From this section the user may save his/her own protocols, and upload them on the internal disk or USB key, by acting on one of the 5 virtual buttons available and entering the protocol name:



#### 4.3.3.1 Load From Disk



When selecting the “Load from Disk” option, a window will appear, from which it is possible to select a protocol (file with extension \*.exp) from the list of protocols previously saved in the touch-screen disk.

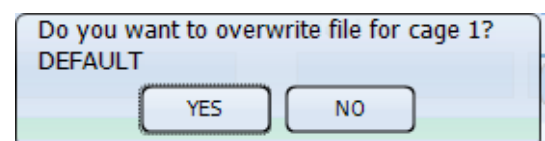
By selecting or deselecting the button related to Cage1, Cage2, Cage3 or Cage4 respectively, you will define the cage/s to which the selected protocol will apply.

The list of all protocols previously saved in the disk may be scrolled on the touch screen.

#### 4.3.3.2 Save to Disk

This function saves the protocol in use on the touch screen disk.

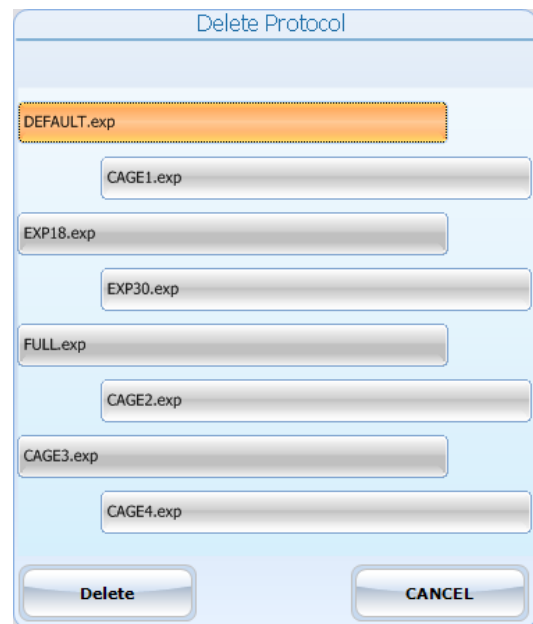
If the protocol name already exists, a window will appear, see example, for each cage active on the system.



#### 4.3.3.3 Delete from Disk

The command “Delete” enables the user to cancel a protocol previously saved on the touch-screen disk.

It is possible to scroll on the touch screen the list of all protocols previously saved in the touch-screen disk.

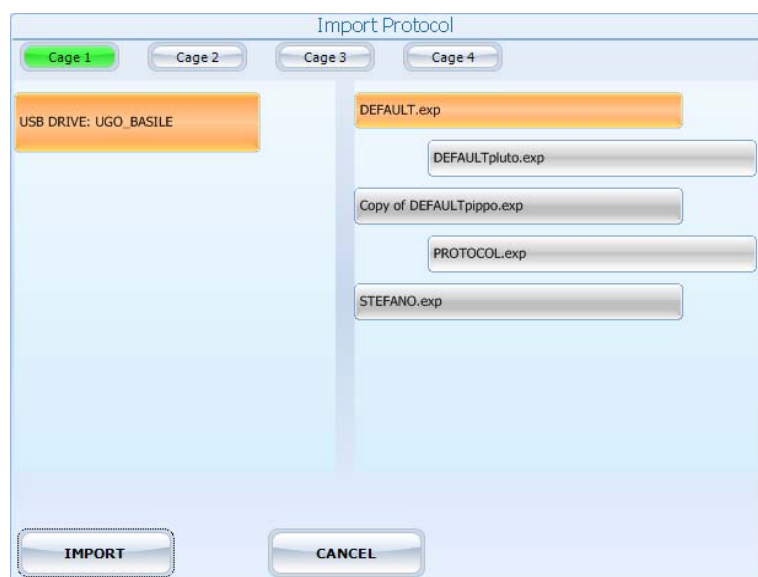


#### 4.3.3.4 Import from USB Drive

Insert the USB key on its slot on the controller, and wait for it to be recognized.

By choosing the “IMPORT” option, the “IMPORT PROTOCOL” window will open, from which it is possible to select the protocol (file with extension \*.exp).

By selecting or deselecting the button related to Cage1, Cage2, Cage3 or Cage4 respectively, you will define the cage/s to which the selected protocol will apply.



The list of all protocols previously saved in the USB drive may be scrolled on the touch screen.

#### 4.3.3.5 Export to USB Drive

This function saves the protocol in use on the USB drive.

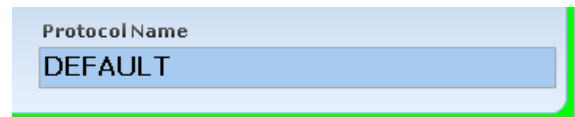
If the protocol name already exists, a window will appear, see example, for each cage active on the system.

If no name is entered in the “File Data Name” field, the file will be exported with the name “default”.



#### 4.4 Protocol Name

The “Protocol Name” field, in the LOAD/SAVE Protocol section, can be edited, to rename the protocol in use, referred to the selected cage.



If no name is entered, the protocol name will be “default”.

#### 4.5 TEST Window

When selecting the “TEST” menu, the following window will appear, displaying the Time-Line associated to each cage and some of the experimental parameters:

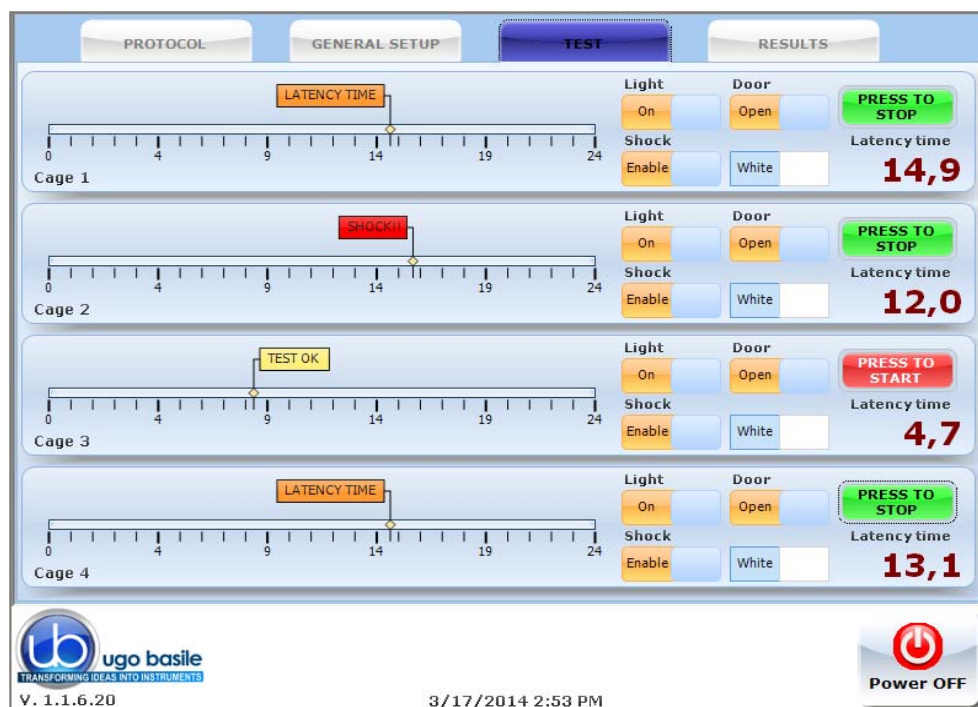


Figure 12 “TEST Window”

### 4.5.1 Commands

For each cage actually connected to the controller, the following commands are shown on the touch-screen:

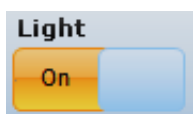


the red **“PRESS TO START”** button starts the trial



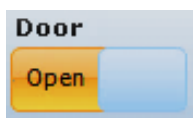
the green **“PRESS TO STOP”** button stops the trial.

If the button is pressed before the end of the **“CUTOFF TIME”** the result of the test in the final result table will be **“STOPPED”**.

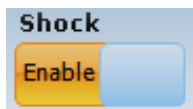


the **“LIGHT”** slide-switch enables/disables (ON/OFF) the light in illuminated compartment of the related cage, even while the experiment is running. Default setting is **“ON”**

The light intensity is set in the **“PROTOCOL”** page, see paragraph 4.1



the **“DOOR”** slide-switch forces the opening/closing of the door dividing the dark from the illuminated compartment, even while the experiment is running. Default setting is **“OPEN”**



the **“SHOCK”** slide-switch forces the emission of the electric shock.

When in the **“ENABLE”** position, the shock will be managed by the time line, according to the parameters defined in the the **“PROTOCOL”** page.

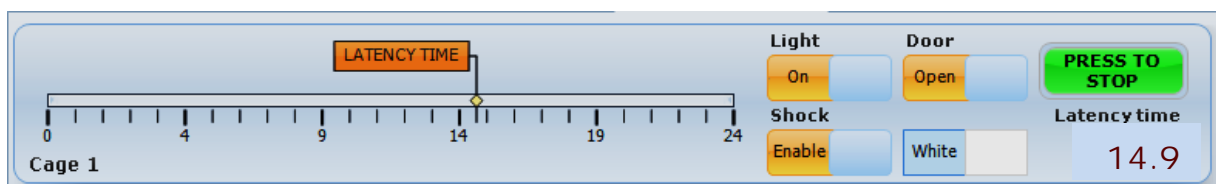
Default setting is **“ENABLE”**

### 4.5.2 Markers

The touch-screen displays the following markers, for each cage actually connected to the controller:

#### 4.5.2.1 Time Line

The cursor sliding along the timeline shows the events in real time during the experiment



Depending on the experiment phase, the Cursor is labelled as follows:

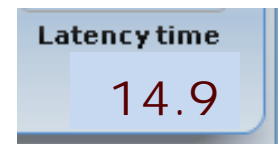
- Door Delay : interval between the start and door opening
- Delay After Crossing : interval between the animal crossing and the door closing
- Latency Time : interval between the door opening and the animal crossing



- Shock : interval in which the electric stimulus is enabled
- Shock Pause : pause between two electric stimuli
- Time Out : interval with no crossing after the cut-off time
- Test OK : positive result of the trial
- Stopped : trial stopped manually via the “PRESS TO STOP” button

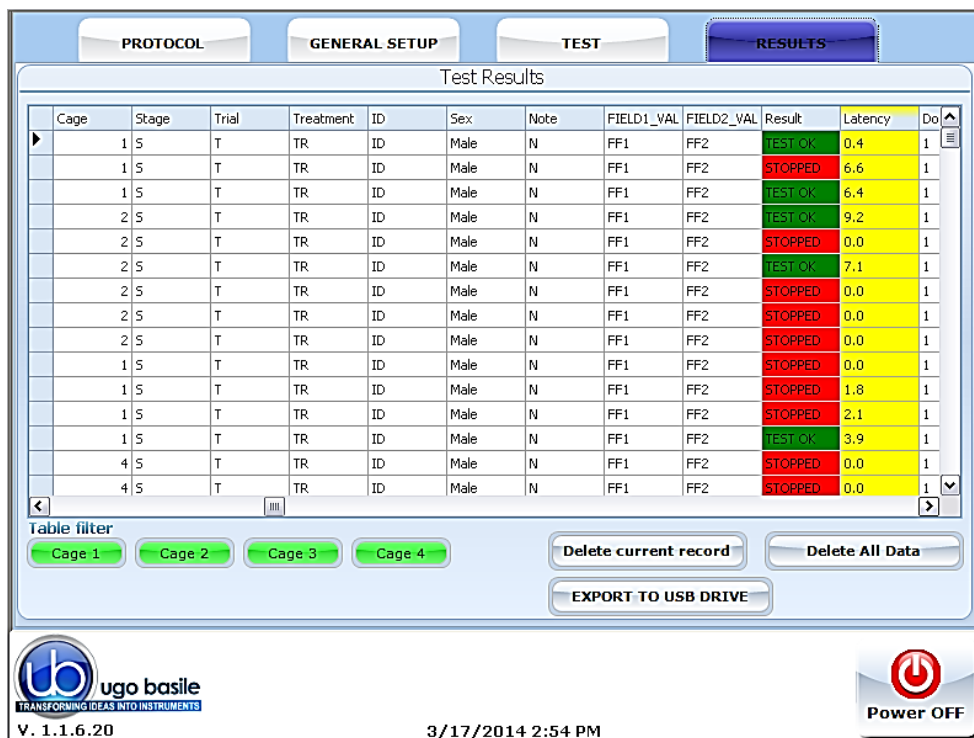
#### 4.5.2.2 Latency Time

This time marker shows the latency time, i.e. the interval between the door opening and the animal crossing, in 0.1 seconds.



## 4.6 RESULTS Window

Pressing the “RESULT” label on the top of the touch screen, will open the RESULT menu:



The screenshot shows the 'RESULTS' window with a table of test results. The table has columns for Cage, Stage, Trial, Treatment, ID, Sex, Note, FIELD1\_VAL, FIELD2\_VAL, Result, Latency, and Do. Below the table are buttons for 'Table filter' (Cage 1-4), 'Delete current record', 'Delete All Data', and 'EXPORT TO USB DRIVE'. The bottom of the screen shows the 'ugo basile' logo, version 'V. 1.1.6.20', the date '3/17/2014 2:54 PM', and a 'Power OFF' button.

Cage	Stage	Trial	Treatment	ID	Sex	Note	FIELD1_VAL	FIELD2_VAL	Result	Latency	Do
1	5	T	TR	ID	Male	N	FF1	FF2	TEST OK	0.4	1
1	5	T	TR	ID	Male	N	FF1	FF2	STOPPED	6.6	1
1	5	T	TR	ID	Male	N	FF1	FF2	TEST OK	6.4	1
2	5	T	TR	ID	Male	N	FF1	FF2	TEST OK	9.2	1
2	5	T	TR	ID	Male	N	FF1	FF2	STOPPED	0.0	1
2	5	T	TR	ID	Male	N	FF1	FF2	TEST OK	7.1	1
2	5	T	TR	ID	Male	N	FF1	FF2	STOPPED	0.0	1
2	5	T	TR	ID	Male	N	FF1	FF2	STOPPED	0.0	1
2	5	T	TR	ID	Male	N	FF1	FF2	STOPPED	0.0	1
1	5	T	TR	ID	Male	N	FF1	FF2	STOPPED	0.0	1
1	5	T	TR	ID	Male	N	FF1	FF2	STOPPED	1.8	1
1	5	T	TR	ID	Male	N	FF1	FF2	STOPPED	2.1	1
1	5	T	TR	ID	Male	N	FF1	FF2	TEST OK	3.9	1
4	5	T	TR	ID	Male	N	FF1	FF2	STOPPED	0.0	1
4	5	T	TR	ID	Male	N	FF1	FF2	STOPPED	0.0	1

Figure 13 “RESULTS Window”

#### 4.6.1 Test Results

The “Test Result” table lists the relevant data for all the trials completed with each cage.

The first column indicates the cage number on which the trial was performed, while the other columns contain the additional information entered by the user on the “Features” menu, see paragraph 4.3.2-Features.

The results are marked in a different color, according to the following color code:

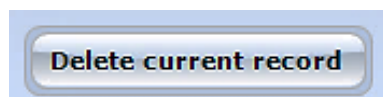
- Green: 
- Red: 
- Orange: 

#### 4.6.2 Table Filter



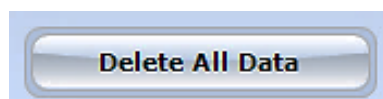
Selecting one or more cages in the table filter, will activate the filters, and the results will be ordered by cage number.

#### 4.6.3 Delete Options



To delete a single record, select it by pressing anywhere inside the related row, then press “Delete Current Record”.

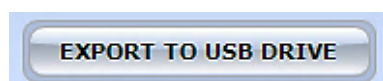
Confirm or cancel the selection by answering **YES** or **NO** to the question “**Delete current record?**”



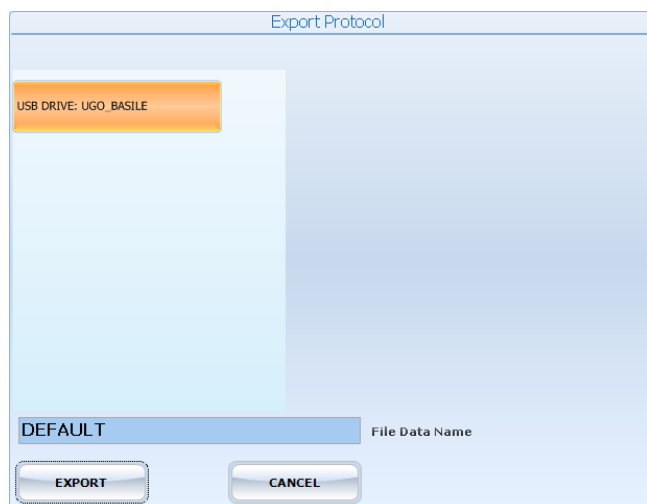
To delete all records saved in the “Test results” table, select “Delete All Data”

Confirm or cancel the selection by answering **YES** or **NO** to the question “**Delete All Data?**”

#### 4.6.4 Export to USB Drive



To export the data in the “Test results” table, insert a USB key in the dedicated slot on the touch-scren controller, then select “EXPORT TO USB DRIVE”: the data will be saved in .CVS format.



The field “File Data Name” (see screenshot) is editable via the touch-scren virtual keyboard.

If no name is entered in the “File Data Name” field, the file will be exported with the name “default”.

## 4.7 Switching Off

The touch-screen controller can be switched off from any menu, by pressing the Power Off virtual button, or by the 'ON/OFF' button located on the back panel, see Figure 6 “Controller, Back Panel”.



## 5 MAINTENANCE

Ugo Basile P.A. Set-Up is covered by a 24-month warranty. Service, if necessary, has to be done by authorized UB personnel only; servicing by anyone other than an authorized service facility will void the warranty.

If a problem occurs, contact your representative, see paragraph 5.6-Customer Support.



***UNPLUG THE MAINS CORD BEFORE CARRYING OUT ANY MAINTENANCE JOB!***

### 5.1 Cleaning and Sterilization

The P.A. hardware may be wiped down with a dry, lint-free cloth. Clean only the Controller case using a damp, soft cloth; do not use chemicals or abrasive elements.

Under no circumstances allow moisture to penetrate the instrument. Unplug power cord from AC outlet before cleaning.

### 5.2 Cleaning the P.A. Cage

The bars of the Cage floor should be cleaned daily, in particular those of the ESCAPE Compartment, to remove traces of the animal faeces which impair contact, especially when dry. Cotton wool, dipped in water/alcohol mixture is recommended for cleaning the bars.

The Cage is provided with a **catch pan** of Nylon coated aluminum which slides in, on two side rails, below the floor grid.

The cage internal contexts (black and white walls), can be easily removed for cleaning.



The reliable door mechanism does not require adjustments and is designed to operate without lubrication. However, in case the door wings are badly smeared by urine and faeces of the rat, a thoroughgoing cleaning is recommended, to remove traces of dirt transported by the door motion to inaccessible spots.

### 5.2.1 Light Fixture

The light source is based on white-light LED technology and will guarantee years of trouble-free operation.

Should it become necessary to replace it, the whole light fixture can be easily detached from the transparent cover, by removing the 3 screws which hold it in place, and the connector branched to the cage back.



## 5.3 Disposal of Old Electrical & Electronic equipment

Applicable in the European Union and other European countries with separate collection systems



This product shall not be treated as household waste. To reduce the environmental impact of WEEE (Waste Electrical and Electronic Equipment) and minimize the volume of WEEE entering landfills, please reuse and recycle.

Send to a recycling center equipped to handle electronics.

## 5.4 Abnormal conditions

Operate the instrument only as intended by the manufacturer. If you suspect the instrument protection has been impaired, disconnect the power cord and secure the instrument against any unintended operation.

The protection is likely to be impaired if, for example, the instrument shows visible damage or has been subjected to severe transport stress. Proper use of instrument depend on careful reading of all instruction and labels.

## 5.5 Long Inactivity

The instrument does not require any particular maintenance after long inactivity.

## 5.6 Customer Support

For any further information you may desire concerning the use and/or maintenance of the P.A. Set-Up, please do not hesitate to contact our **service department** (or our local distributor) either directly or via our support page <http://www.ugobasile.com/support.html> :



### UGO BASILE s.r.l.

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[logistics@ugobasile.com](mailto:logistics@ugobasile.com)  
[sales@ugobasile.com](mailto:sales@ugobasile.com)

**Before sending any instrument to our factory for repair**, please contact our logistics department to obtain a return authorization number (RMA) and shipping/packing instructions.

We may not be held responsible for damages during transport due to poor packing; whenever possible, please use the original packing.

## 6 ORDERING INFORMATION

### Passive Avoidance Set-Up, Rat, consisting of:

- 40500-001 Controller with Touch Screen and 8-pole Scrambling Shocker, including
  - 40550-010 Software and activation
- 40552 P.A. Rat Cage
- E-WP 008 Mains Cable
- E-AU 074 Power Supply
- 52010-323 USB Cable
- E-AU 041 USB pen-drive, including
  - 40550-302 Instruction Manual

### Passive Avoidance Set-Up, Mouse, consisting of:

- 40500-001 Controller with Touch Screen and 8-pole Scrambling Shocker
  - 40550-010 Software and activation
- 40553 P.A. Mouse Cage
- E-WP 008 Mains Cable
- E-AU 074 Power Supply
- 52010-323 USB Cable

E-AU 041 USB pen-drive, including  
40550-302 Instruction Manual

## 6.1 Multiple-Cage Set-Up

The following is an example of configuration of a 4-Cage Mouse set-up:

No. 1	40500-001	Controller with Touch Screen and 8-pole Scrambling Shocker 40550-010 Software and activation
No. 4	40553	P.A. Mouse Cage
No. 3	40500-005	Expansion Box (one is required for each additional cage)

## 7 INSTRUMENT SPECIFICATIONS

### Touch Screen Controller

LCD	12" with resistive touch screen
CPU Module Port	2 USB Port 2.0; 1 Ethernet port 10/100Mb; 1 DVI port for external monitor
Peripheral Port	4 output for Sound, Shock and light; 1 Power supply 12V-2A
Expansion Bus Connection	2 RJ11 connectors 1 USB port type B ( not used )

### Settings

Shock	Constant current
Shock Intensity	from 0.1 to 2.9mA, in 0.1mA steps
Shock Duration	Duration: from 0 to 99 seconds
Visible Light	Variable from 0 to 1800 Lux
Operating Temperature	10° to 40°C
Sound Level	Negligible
Pollution Degree	≤ 2

### Physical

Net weight	Rat Cage	5.3Kg
	Mouse Cage	3.4Kg
	Controller	2.7Kg
Shipping Weight	Rat Set-Up	13Kg
	Mouse Set-Up	12Kg
Dimensions	Rat Cage	57x27x30(h)cm, I.D. 48x20x22(h)cm
	Mouse Cage	47x18x25(h)cm, I.D. 38x9x17(h)cm



Packing Dimensions      Controller and One Cage    80x60x44cm

## Warranty

40550 is covered by a 24-month warranty

## 8 BIBLIOGRAPHY

### 8.1 Papers Mentioning UB P.A. Test (Step-through)

- C.I. Navarro-Francés et alia: **“Influence of trait anxiety on the effects of acute stress on learning and retention of the passive avoidance task in male and female mice”** Behav. Processes 105: 6-14, 2014
- L. Zvejniece et alia: **“The cognition-enhancing activity of E1R, a novel positive allosteric modulator of sigma-1 receptors”** Br. J. Pharmacol. 171(3): 761-771, 2014
- P. Borracci et alia: **“Rat embryo exposure to all-trans retinoic acid results in long-term cognitive deficits”** Eur. Rev. Med. Pharmacol. Sci 18:28-33, 2014
- C. Nasuti et alia: **“Neonatal exposure to permethrin pesticide causes life-long fear and spatial learning deficits and alters hippocampal morphology of synapses”** J. Neurodevelopmental Disorders 6-7: 1866-1955, 2014
- R.W. Flint et alia: **“NMDA Receptor Antagonism with MK-801 Impairs Consolidation and Reconsolidation of Passive Avoidance Conditioning in Adolescent Rats: Evidence for a State Dependent Reconsolidation Effect”** Neurobiology of Learning and Memory 101: 114-119, 2013
- G. Telegdy et alia: **“The Action of Kisspeptin-13 on Passive Avoidance Learning in Mice. Involvement of Transmitters”** Behav. Brain Res. 243: 300-305, 2013
- V. Capurro et alia: **“Pharmacological Characterization of Memoquin, a Multi-Target Compound for the Treatment of Alzheimer’s Disease”** PLoS ONE 8(2): e56870, 2013
- J. Michaud et alia: **“Hematopoietic MyD88-Adaptor Protein Acts as a Natural Defense Mechanism for Cognitive Deficits in Alzheimer’s Disease”** Stem Cell Reviews and Reports 8 (3): 898-904, 2012
- E.R.A.Y. Detrait et alia: **“The inhibitory avoidance test optimized for discovery of cognitive enhancers”** Behavior Research Methods 41 (3): 805-811, 2009



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## CE CONFORMITY STATEMENT

Manufacturer **UGO BASILE srl**  
Address Via G. di Vittorio, 2 – 21036 Gemonio, VA, ITALY  
Phone n. +39 0332 744574  
Fax n. +39 0332 745488

*We hereby declare that*

Instrument. **PASSIVE AVOIDANCE SET-UP**  
Catalog number **40552 – 40553 – 40500-001**

*It is manufactured in compliance with the following European Union Directives  
and relevant harmonized standards*

- *2006/95/CE relating to electrical equipment designed for use within certain voltage limits*
- *2004/108/CE relating to electromagnetic compatibility*
- *2011/65/UE on the restriction of the use of certain hazardous substances in electrical and electronic equipment*

Account Manager

Adriano Basile

Nome / Name

April 2014

Date

  
Firma / Signature