

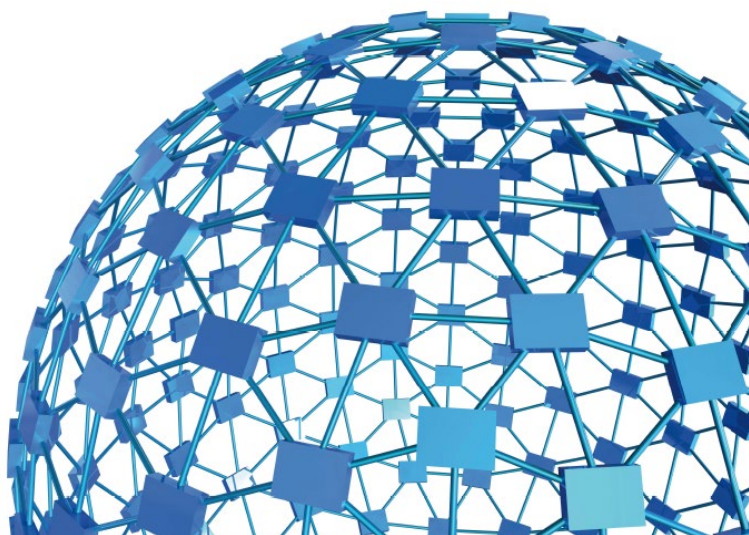


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TRANSFORMING IDEAS  
INTO INSTRUMENTS

# instruction manual

**Active Avoidance Set-Up**  
**Cat. No. 40530**



**UGO BASILE S.R.L.**

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**instruction manual**

**Active Avoidance Set-Up  
Cat. No. 40530**

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.**



## Active Avoidance Set-Up (Automatic Reflex Conditioner)

## SPECIFIC CAGES FOR RATS AND FOR MICE

Cat. No. 40530

### General

The new model of **Active Avoidance Set-Up** has been designed to enable the researcher to perform a wide range of avoidance experiments, each according to a flexible schedule.

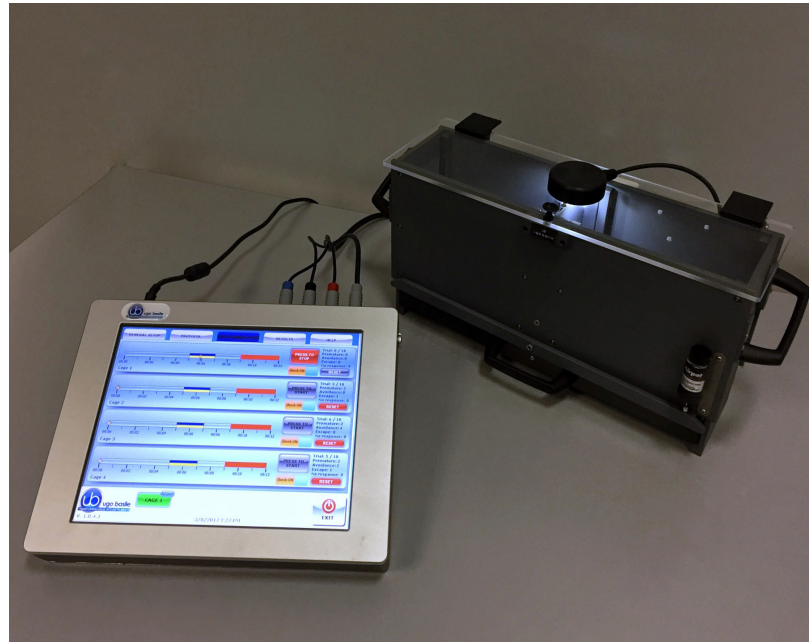
Via the **TIMELINE** feature, the user will be able to configure a number of different tests, according to the specific experimental needs, namely the classical shuttle-box tests in its various modes.

Ugo Basile Active Avoidance set-up instrument basically consists of a Controller, and a Cage for either rat or mouse.

The tests are conducted in a cage, divided into two sections by a partition with an intercommunicating opening at floor level.

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

The electronic unit encompasses all controls for up to 4 cages, and a scrambling shocker.



**NEW VERSION**

**Multiple-Cage Set-up**

**EFFICIENT, RELIABLE INSTRUMENT FOR THE CLASSIC ACTIVE AVOIDANCE TEST**



### Main Features

- **Maximum flexibility:** configure your own Avoidance-Experiment Schedules via the **timeline** function
- The electronic unit encompasses all controls for **up to 4 animal cages!**
- **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!



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# CHECK-LIST

## Cat. No. 40530 Active 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		
	40530-010	✓		SOFTWARE ACTIVATION	SOFTWARE E ATTIVAZIONE		
<b>→ IMPORTANT: SOFTWARE IS PRE-INSTALLED ON 40500-001</b>							
	40532		1	A.A. RAT CAGE	GABBIA A.A. RATTO		
	40533		1	A.A. MOUSE CAGE	GABBIA A.A. TOPO		
E-AU 041 USB pen-drive	40530-302		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		
	40532			ADDITIONAL P.A. RAT CAGE/S	GABBIA P.A. RATTO AGGIUNTIVA		
	40533			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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# Active Avoidance Set-Up

**Cat. 40530**

## 1 GENERAL

Behavioral scientists are well acquainted with 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.

Avoidance tests were 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.

### 1.1 Principle of Operation

Active avoidance is a fear-motivated associative avoidance task. In this task the animal has to learn to predict the occurrence of an aversive event (shock) based on the presentation of a specific stimulus (tone), in order to avoid the aversive event by moving to a different compartment.

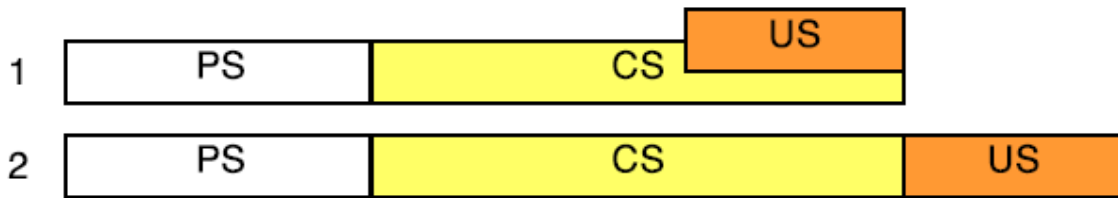
The measures recorded include number of avoidances (the mouse crossing to the other compartment during the warning signal), number of non-responses (the mouse failing to cross to the other compartment during the trial), response latency (latency to avoid or escape), number of intertrial responses (i.e., crossing the barrier within the intertrial interval), and serve as an index of learning and allows memory to be assessed.

The tests are conducted in a cage, divided into two sections by a partition with an intercommunicating opening at floor level. Both compartments are lighted by overhead stimulus lights.

Each compartments has a grid floor through which a foot shock can be delivered.

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

### 1.1.1 Sequences



- **PS** : pre-stimulus
- **CS** : conditioned stimulus period
- **US** : unconditioned stimulus period
- **T0** : timer pre-stimulus
- **T1** : CS timer
- **T2** : US timer



#### **IMPORTANT!**

- **US** can be partially or totally overlapping **CS**
- A **CS** event cannot take place after an **US** event.

When a rodent crosses during the PS phase, it is recorded as **Premature**.

When a rodent crosses to the other compartment during CS presentation, this is recorded as an **Avoidance**.

When the mouse jumps to the other side when both CS and US are present, this is recorded as an **Escape Response**.

If the animal fails to cross during the trial, this is recorded as a **No Response**.



**Sequence 1**

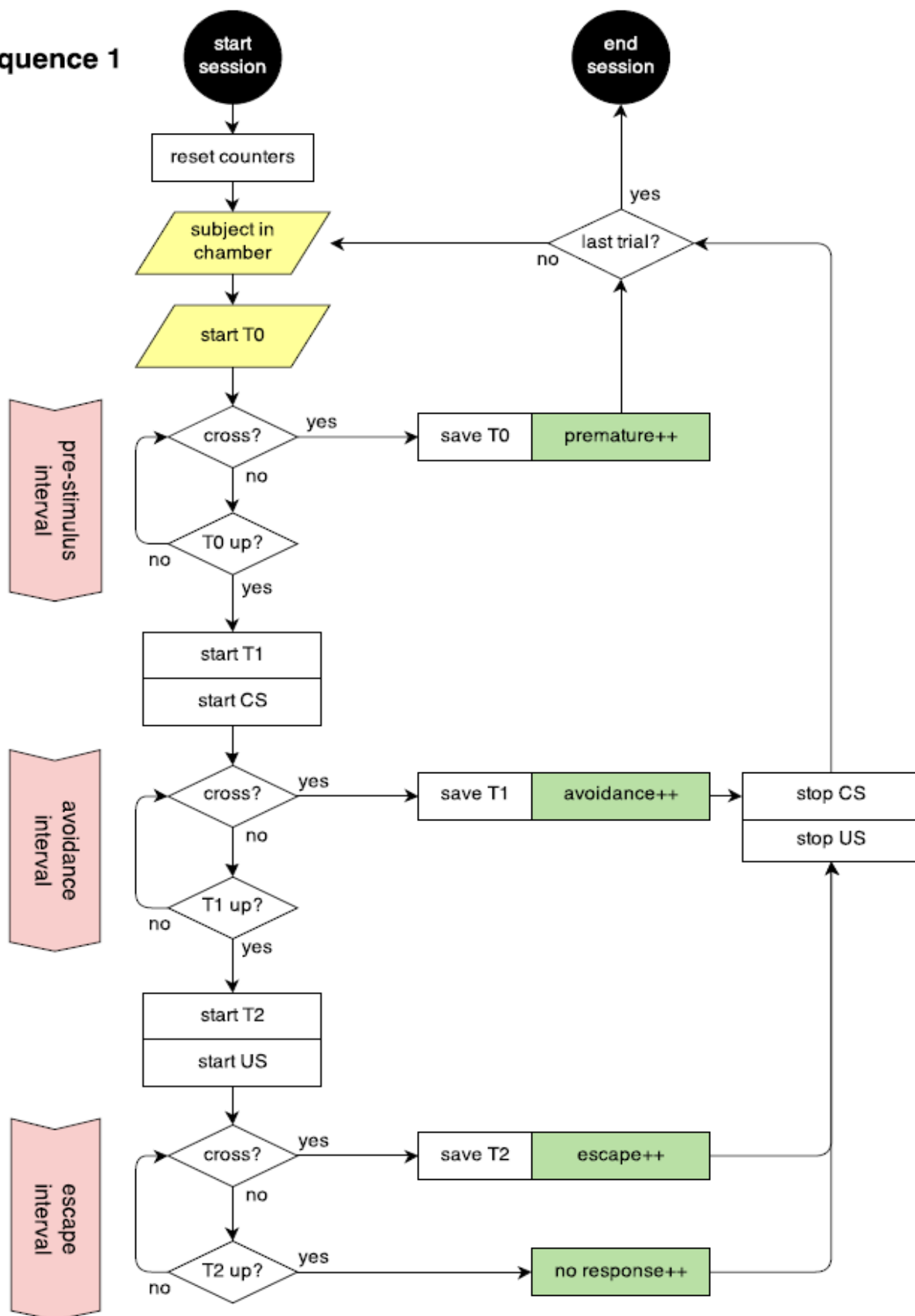


Figure 1 "A.A. Flow-Chart"

## 2 INSTRUMENT DESCRIPTION

The new model of Active Avoidance Set-Up has been designed with maximum versatility, while ensuring reliability of functions and therefore reproducibility of the results, to enable the researcher to perform a wide range of avoidance experiments, each according to a flexible schedule.

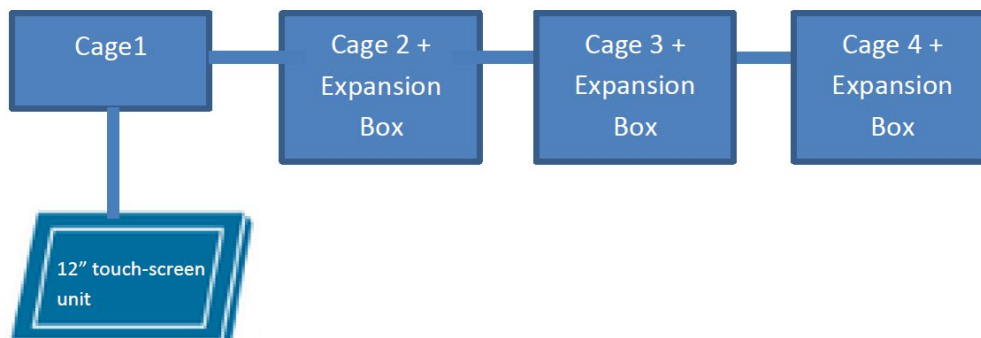
Via the TIMELINE feature, the user will be able to configure a number of different tests, according to the specific experimental needs, namely the classical shuttle-box tests in its various modes.

### The instrument basically consists of:

- **40500-001** 12" Touch-Screen Controller, encompassing a precision 8-pole shocker (see paragraph 2.1)
- **40530-010** A.A. Software, pre-installed on the Controller (see 3.5.3)
- **40532** Rat Cage (see paragraph 2.2)  
or
- **40533** 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 Touch-Screen Controller for Conditioning Tests

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 conditioning 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 will be 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:

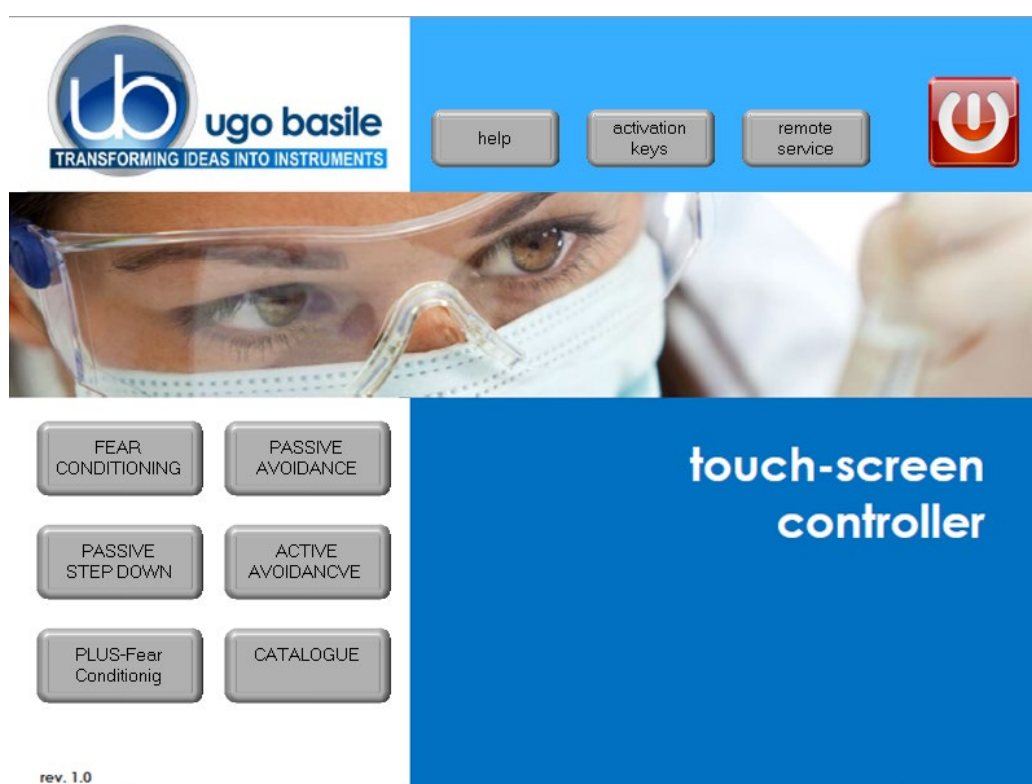


Figure 2 “Launcher”

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 Active 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 Active Avoidance application software, the 40500-001 becomes the main Controller Unit to perform A.A. 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 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.

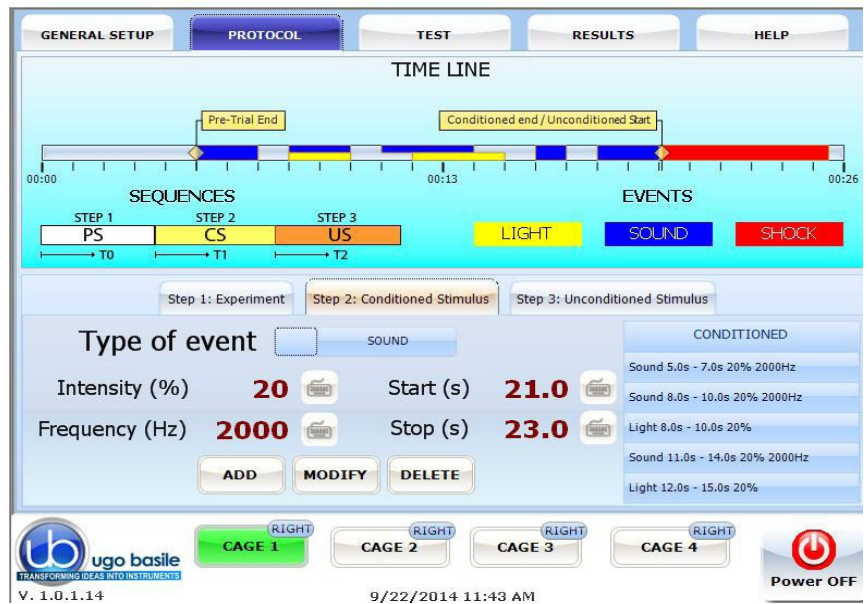


Figure 4 "Timeline"

## 2.2 Active-Avoidance Cage

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

- **40532** designed for Rats dimensioned 57x27x30(h)cm, I.D. 48x20x22(h)cm
- **40533** designed for Mice dimensioned 47x18x25(h)cm, I.D. 38x9x17(h)cm

The cage is divided into two sections, by a partition with an inter-communicating opening at floor level.

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

The cage is provided with acoustic and visual conditioning stimulators.

The reinforcement consists of an electrical stimulus applied to the floor bars of the cage by an incorporated 8-pole "scrambling" circuit.

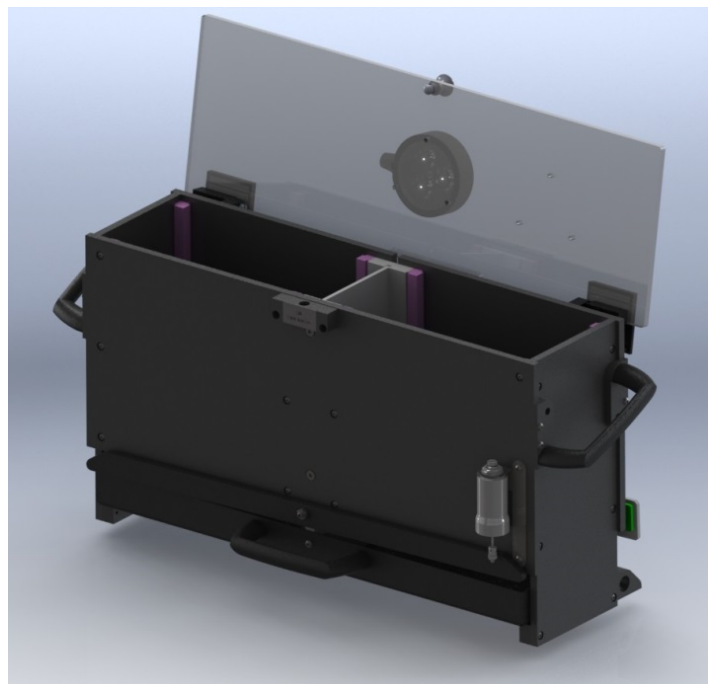


Figure 5 "A.A. Mouse Cage 40533"

## 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 A.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 40530 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. Our Instruction Manuals are available as free download on our website.

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

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 Active Avoidance Set-Up on a stable bench or table surface. Once the 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 A.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 40532 or 40533
- Touch-Screen Controller 40500-001 (with preinstalled software 40550-010)

#### 3.5.1 Connections

Observe the back panel of the Touch-Screen Controller:



Figure 6 “Controller, Back Panel”

And the same back panel, with all connections:



Figure 7 “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): floor tilting 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:

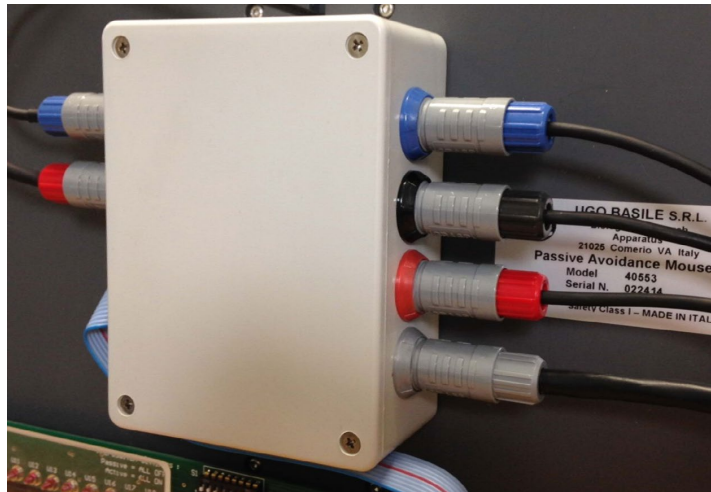


Figure 8 "Expansion Box Connections"

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 colour code as described in paragraph 3.5.1.

### 3.5.3 A.A. Software

The A.A. software 40530-010 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 paragraphs 2.1 and 4.5)

When a new AA software version is available, it may be uploaded via the "**Update Application**" button (see paragraph 4.2.3.1).

## 3.6 Intended Use

The A.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 A.A. application software by the related button on the launcher menu.



**Also refer to the help section on the launcher menu on the Controller:**



## 4.2 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).

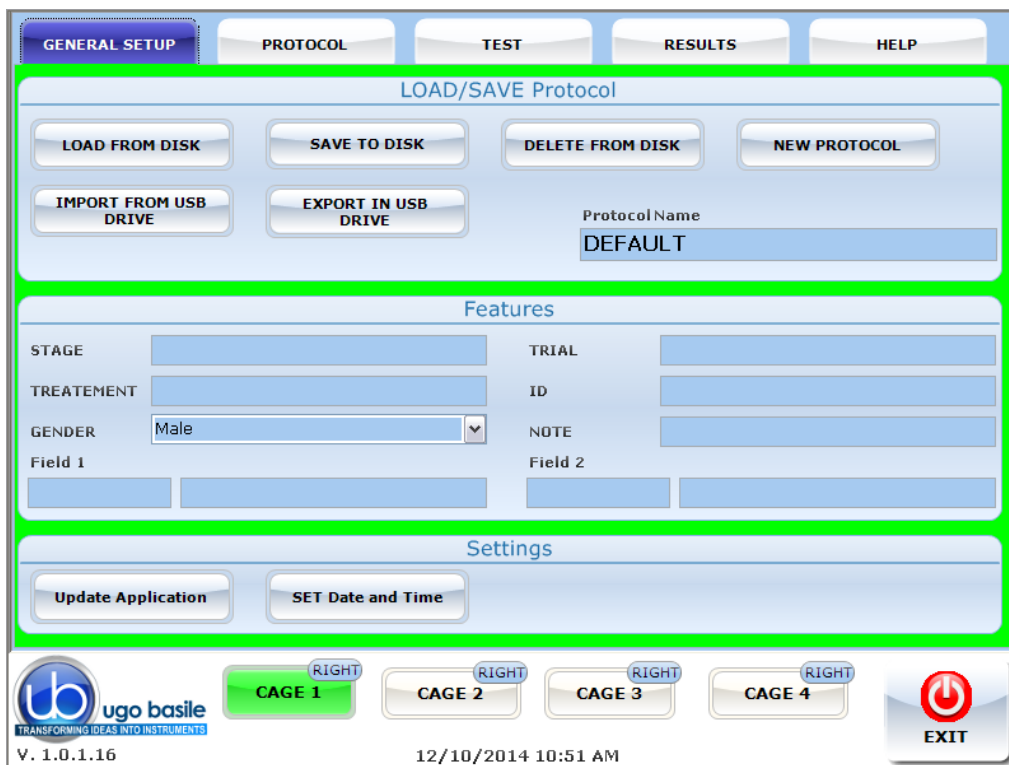


Figure 9 “GENERAL SET-UP Window”

This page is divided into three sub-sections, described in detail in the next paragraphs:

- LOAD/SAVE Protocol
- Features
- Settings

In all windows, the bottom row shows the cages physically connected and communicating correctly with the controller:



The current position of the animal, in the cage left or right section, is confirmed by the caption RIGHT or LEFT:



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.

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)

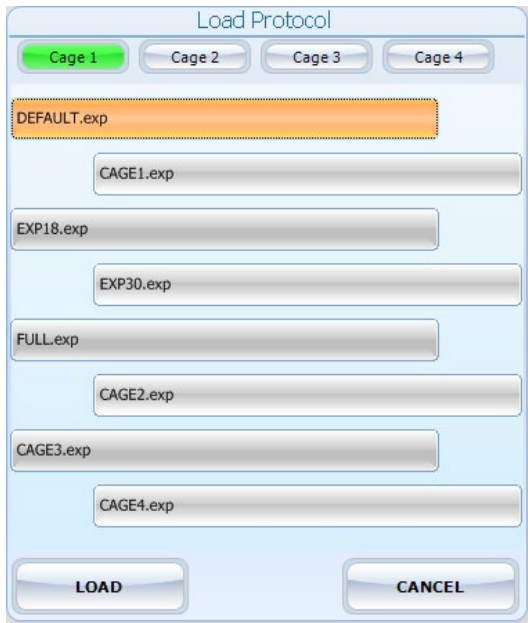


#### 4.2.1 LOAD/SAVE Protocol

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:



### 4.2.1.1 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.

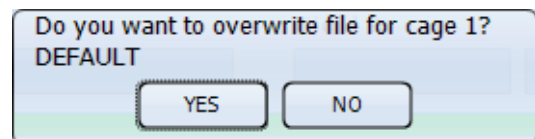
By selecting or deselecting the button related to Cage1, Cage2, Cage3 or Cage4 respectively, you will define the cage/s to which the selected protocol will apply.

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

### 4.2.1.2 Save to Disk

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

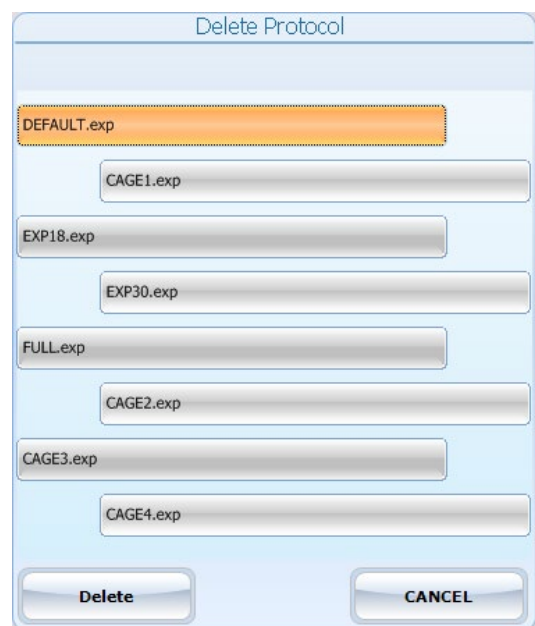
If the protocol name already exists, a window will appear, see example, for each cage active on the system.



### 4.2.1.3 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.



#### 4.2.1.4 New Protocol

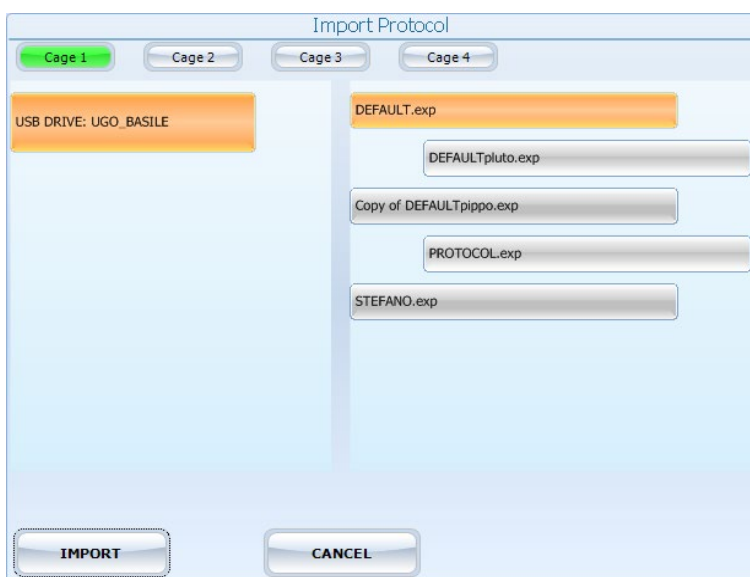
The NEW PROTOCOL key resets all the fields in the “Features” window and in the PROTOCOL page.

#### 4.2.1.5 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.

#### 4.2.1.6 Export in 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”.

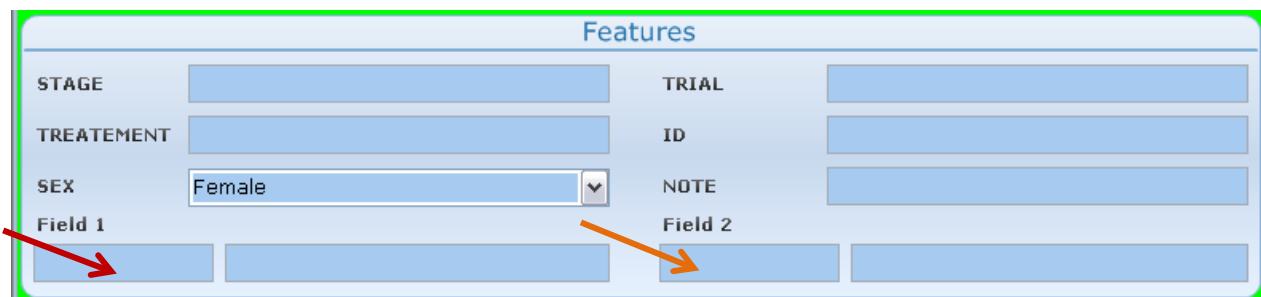


#### 4.2.2 Features

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 data-base 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



The screenshot shows a form titled "Features" with the following fields:

STAGE	<input type="text"/>	TRIAL	<input type="text"/>
TREATMENT	<input type="text"/>	ID	<input type="text"/>
SEX	<input type="text" value="Female"/>	NOTE	<input type="text"/>
Field 1	<input type="text"/>	Field 2	<input type="text"/>

A red arrow points to the "Field 1" input field, and an orange arrow points to the "Field 2" input field.

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 4.5-RESULT Window).

### 4.2.3 Settings

#### 4.2.3.1 Update Application

When a new AA 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 "Active.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.

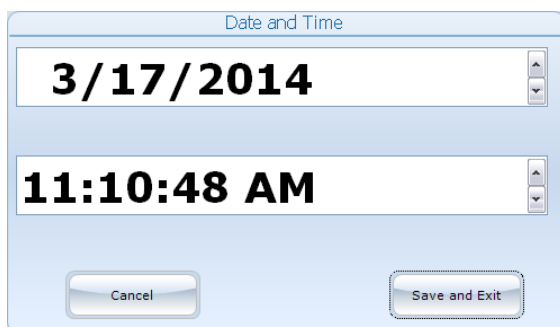


**NOTES:**

- 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!!!”

**4.2.3.2 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 PROTOCOL Window**

From the PROTOCOL window the user sets the protocol parameters.

The window is divided into 4 sections:

- **Time Line**
- **STEP 1: Experiment**
- **STEP 2: Conditioned Stimulus**
- **STEP 3: Unconditioned Stimulus**

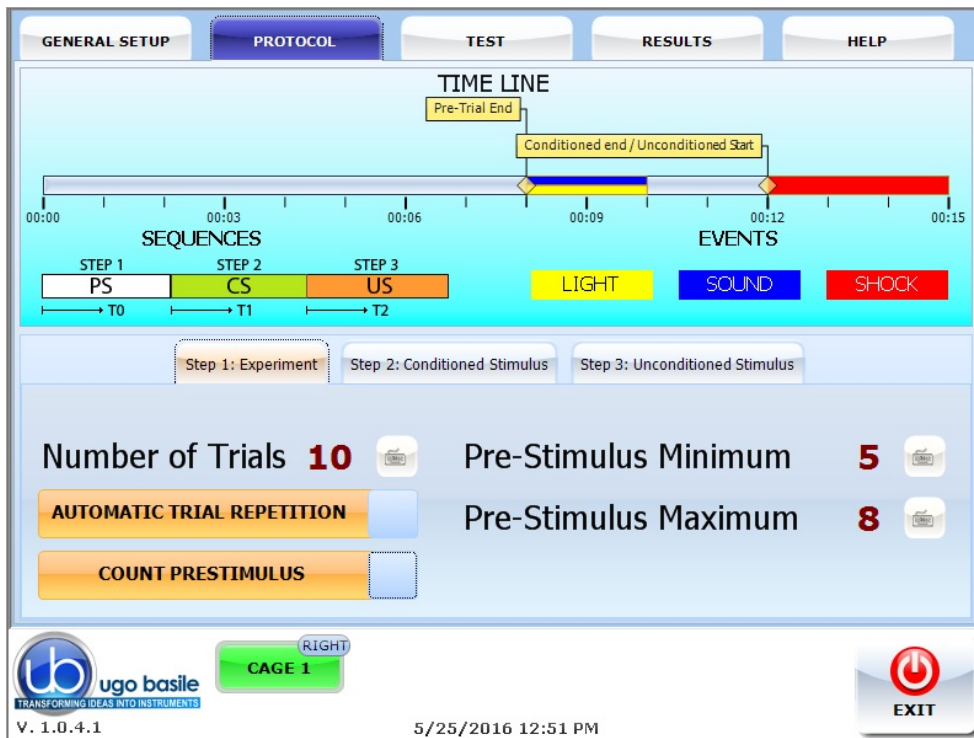
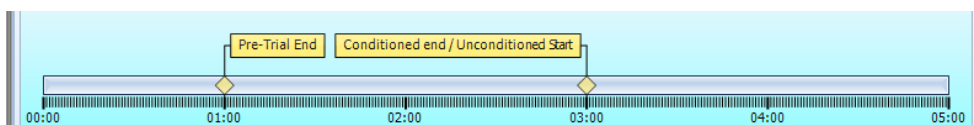


Figure 10 "PROTOCOL Window"

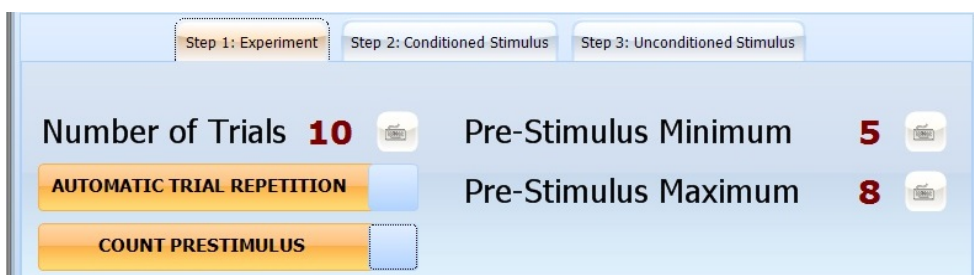
Values are entered by clicking on the virtual keyboard icon 

### 4.3.1 Time Line

The Time Line shows the sequence of events programmed for the experiment. Two time stamps on the time line define the **end of the pre-stimulus period**, and the **end of the conditioned period/beginning of unconditioned period**.



### 4.3.2 STEP 1: Experiment



STEP 1 sets the experiment features, whereas:

- Number of Trials** : **0-999, step 1** - represents the protocol repetitions



- **Pre-Stimulus Minimum** : 1-99s, step 1s  
&
- **Pre- Stimulus Maximum** : 1-99s, step 1s

Set the duration of the pre-stimulus interval. In this time interval there are no stimuli; it's an habituation period.

If pre-stimulus minimum and pre-stimulus maximum are set at the same value, the period has a constant duration; if the pre-stimulus minimum is lower than pre-stimulus maximum, the trials will start random in a moment comprised between minimum & maximum.

The timer T0 starts with the beginning of the pre-stimulus period.

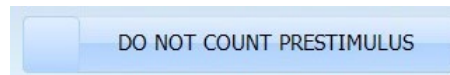
- **Automatic Trial Repetition** : when this function is enabled, when one trial is over, the **device automatically starts** with the following in sequence, until the indicated number of trials is reached. If this function is not enabled, each trail in the sequence has to be started manually.
- **Count Pre-Stimulus** : when the slide switch is on



the device counts the crossing during this specific phase and proceeds to the next trial (skipping the CS and US phases)

or

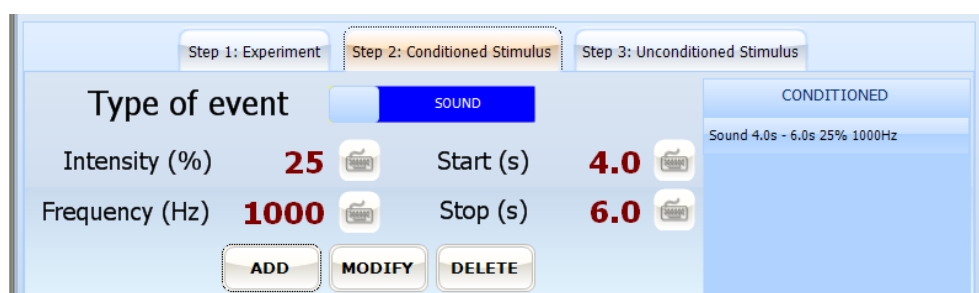
- **Do not Count Pre-Stimulus** : when the slide switch is on



even if a crossing occurs during this specific phase the device proceeds with the CS and US phases without counting a premature crossing.

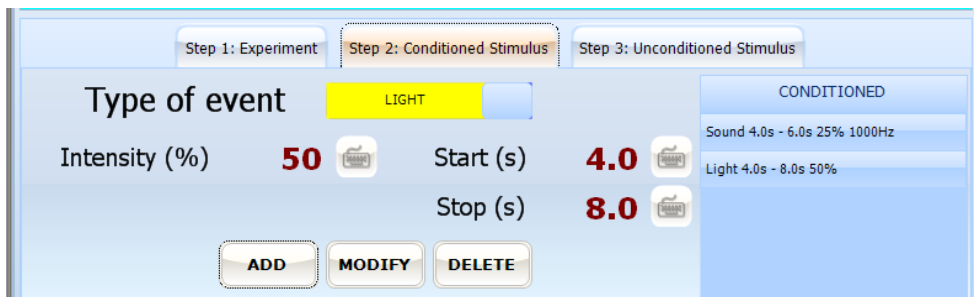
### 4.3.3 STEP 2: Conditioned Stimulus

Sound e Light events are created in this section; first select the type by the slide switch "Type of event".



The **Sound** event is defined via the following parameters:

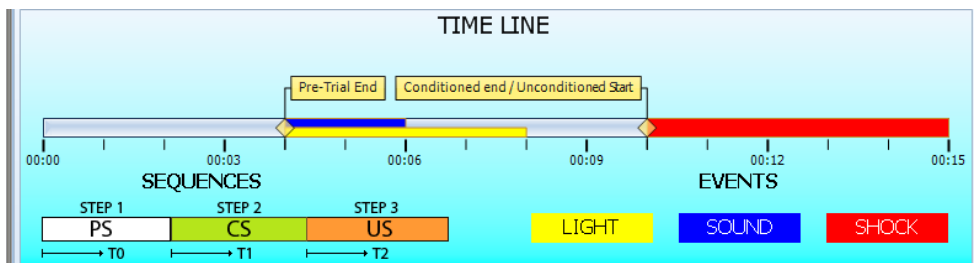
- **Intensity :**            **0-100% step 5%**
- **Frequency :**         **100-18.000H step 100**
- **Start :**                **precision 0.1s**
- **Stop :**                **precision 0.1s**



The **Light** event is defined via the following parameters:

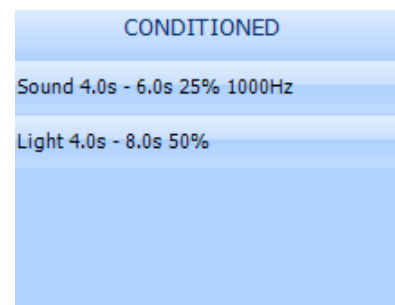
- **Intensity :**            **0-100% step 5%**
- **Start :**                **precision 0.1s**
- **Stop :**                **precision 0.1s**

Having entered the parameters, depress  to save; the event appears on the time line (a yellow line for light, a blue line for sound)

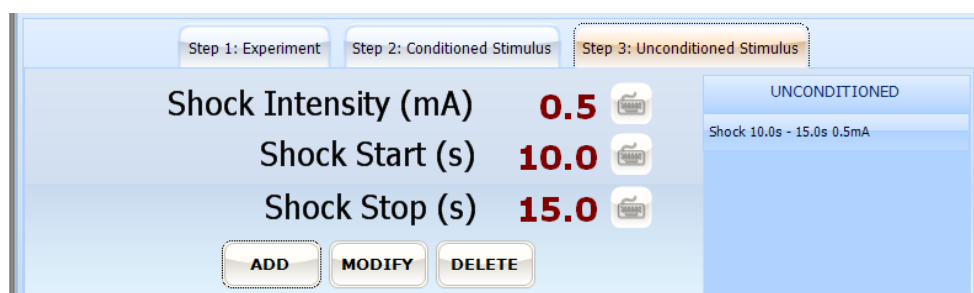


and is added to the “CONDITIONED” list on the right of the screen.

To modify or delete an event, select it from the list, then chose, respectively  or .





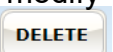
### 4.3.4 STEP 3: Unconditioned Stimulus



A **Shock** event is created in Step 3 and defined via the following parameters:

- **Shock Intensity** : 0-3mA, step 0.1
- **Start** : precision 0.1s
- **Stop** : precision 0.1s

Having entered the parameters, depress  to save; the event appears on the time line as a red line, and is added to the “UNCONDITIONED” list on the right of the screen.

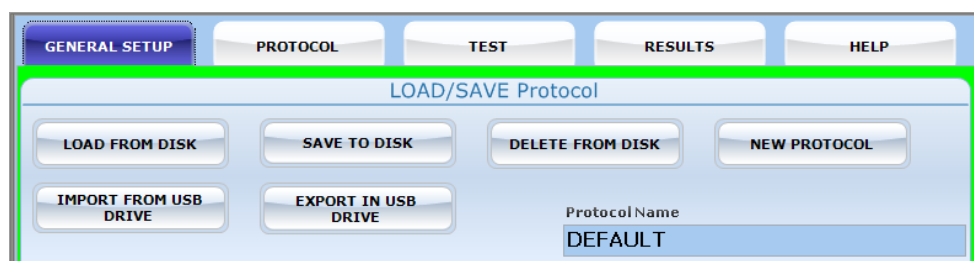
To modify or delete an event, select it from the list, then choose, respectively  or .



#### Limits in the creation of the time line:

- two “Light” events can’t overlapped
- two “Sound” events can’t overlapped
- two “Shock” events can’t overlapped
- a “Light” or “Sound” event cannot take place after a “Shock” event

Once all the parameters have been defined, to save the protocol on the Touch-Screen Controller or on UBS, go back to the General Setup window.



## 4.4 TEST Window

When selecting the “TEST” menu, the following window will appear, displaying the Time-Line associated to each cage: the cursor moves along the timeline while the test is running

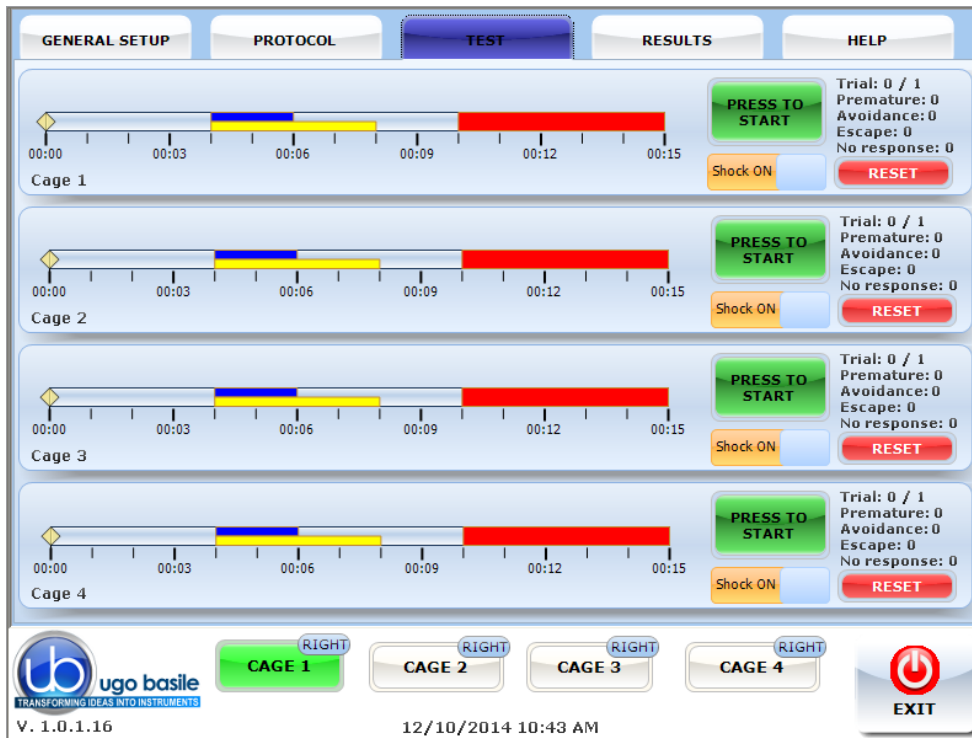


Figure 11 “TEST Window”

### 4.4.1 Commands

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



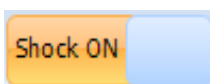
The “**PRESS TO START**” button starts the trial. The “PRESS TO START” key is **green** when a cage is connected to the system.

If one or more cages are not connected, the key will appear as inactive (grey color).



The **red** “**PRESS TO STOP**” button stops the trial.

It is possible to restart an interrupted trial, by depressing the “**PRESS TO START**” button again.



During the test, it is always possible to disable the shock, via the Shock ON/Shock OFF slide switch.



To Start a new test, press the “**RESET**” button, followed by “**PRESS TO START**”.

## 4.4.2 Test Counters

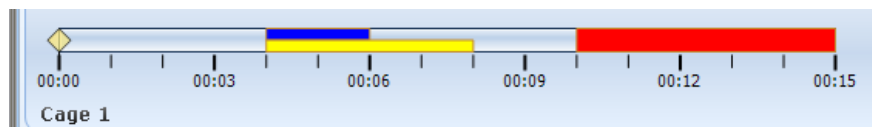
The following counters are displayed above the RESET button for each cage:

- **Trial:** indicating which trial number is running, in relation to the preset number
- **Premature:** indicating the total number of crossings from one chamber to the other, in the Pre-Trial Period.
- **Avoidance:** indicating the total number of crossings, in the Conditioned Period.
- **Escape:** indicating the total number of crossings, in the Unconditioned Period.
- **No Response:** indicating the total number of trials completed without crossings.



### 4.4.2.1 Time Line

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



Events appear on the time line as a **yellow** line for **light**, a **blue** line for **sound**, a **red** line for **shock**.

## 4.5 RESULT Window

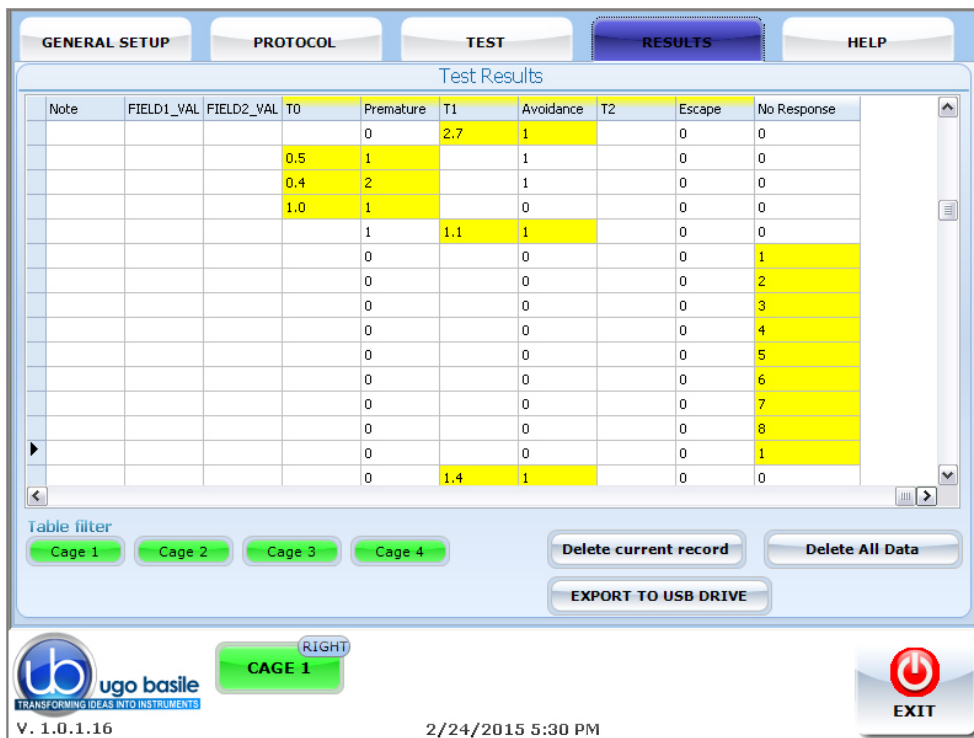
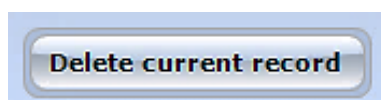


Figure 12 “RESULT Window”

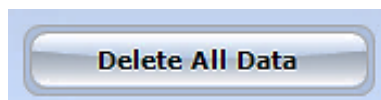
The result window appears as a table, providing for each trial, the data relating to each phase (pre-stimulus, conditioned stimulus, unconditioned stimulus).

### 4.5.1 Delete Options



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

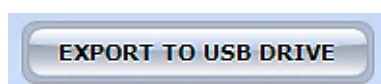
Confirm or cancel the selection by answering **YES** or **NO** to the question “**Delete current record?**”



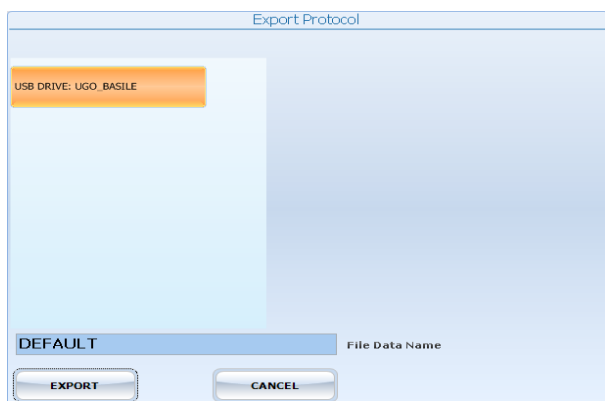
To delete all records saved in the “Test results” table, select “Delete All Data”

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

### 4.5.2 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.

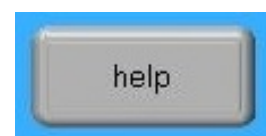


The field “File Data Name” (see screenshot) is editable via the touch-screen virtual keyboard.

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

## 4.6 HELP

The help section contains the active avoidance user manual.



## 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 A.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.

### 5.1 Cleaning and Sterilization

The A.A. hardware may be wiped down with a dry, lint-free cloth. Clean 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.



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

## 5.2 Cleaning the 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.

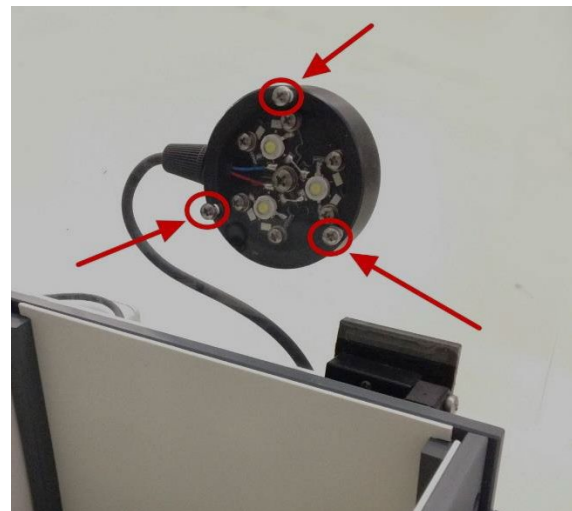
The Cage is provided with a **catch pan** of Nylon coated aluminum which slides in, on two side rails, below the floor grid.



### 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 A.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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21036 GEMONIO – Varese, ITALY



Phone : +39 0332 744574



[service@ugobasile.com](mailto:service@ugobasile.com)  
[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

**Active Avoidance Set-Up, Rat**, consisting of:

- 40500-001 Controller with Touch Screen and 8-pole Scrambling Shocker, including  
40530-010 Software and activation
- 40532 A.A. Rat Cage
- E-WP 008 Mains Cable

- E-AU 074 Power Supply
- 52010-323 USB Cable
- E-AU 041 USB pen-drive, including
- 40530-302 Instruction Manual

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

- 40500-001 Controller with Touch Screen and 8-pole Scrambling Shocker
- 405350-010 Software and activation
- 40533 A.A. Mouse Cage
- E-WP 008 Mains Cable
- E-AU 074 Power Supply
- 52010-323 USB Cable
- E-AU 041 USB pen-drive, including
- 40530-302 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
- 40530-010 Software and activation
- No. 4      40533              A.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 0.0 to 3mA, in 0.1mA steps
Shock Duration	in 0.1s
Visible Light	0-100, in steps of 5%

Sound frequency 100-18.000Hz, in steps of 100Hz

### 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)
	Mouse Cage	47x18x25(h)cm, I.D. 38x9x17(h)cm
Packing Dimensions	Controller and One Cage	80x60x44cm
Operating Temperature	10° to 40°C	
Pollution Degree	≤ 2	

### Warranty

40530 is covered by a 24-month warranty

## 8 BIBLIOGRAPHY

### 8.1 Papers Mentioning UB A.A. Test

- 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**
- 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**
- D. Dimitrova, D. Getova: **"Effects of Rivastigmine on Learning and Memory Processes in Rats Active Avoidance Test"** *Medicine* 4.1, **2014**
- D. Cutuli et alia: **"n-3 Polyunsaturated Fatty Acids Supplementation Enhances hippocampal Functionality in Aged Mice"** *Front Aging Neurosci* 6, **2014**
- G.N. Carmona et alia: **"The Dense Core Vesicle Protein IA-2, but not IA-2β, is Required for Active Avoidance Learning"** *Neuroscience* 269 (6): 35-42, **2014**
- A. Buzescu et alia: **"The Influence of Some Psychotropic Substances on Conditioning Using an Active Avoidance Paradigm"** *Farmacologia* 62(1), **2014**

- O. Ortiz et alia: “**Associative Learning and CA3–CA1 Synaptic Plasticity Are Impaired in D1R Null, Drd1a/Mice and in Hippocampal siRNA Silenced Drd1a Mice**” J.Neuroscience 30 (37): 12288-12300, 2010
- J.I. Lemos et alia: “**Involvement of the prelimbic prefrontacortex on cannabidiol-induced attenuation of contextual conditioned fear in rats**” Behav. Brain Res. 207: 05-111, 2010
- N. Seferos et alia: “**Mandibular bone density and calcium content affected by different kind of stress in mice**” J Musculoskelet Neuronal Interact. 10 (3): 231-236, 2010



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TRANSFORMING IDEAS  
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Phone n. +39 0332 744574  
Fax n. +39 0332 745488

*We hereby declare that*

Instrument. **ACTIVE AVOIDANCE SET-UP**  
Catalog number **40532 – 40533 – 40500-001**

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

- *2014/35/UE relating to electrical equipment designed for use within certain voltage limits*
- *2014/30/UE relating to electromagnetic compatibility*
- *2011/65/UE and 2015/863/UE on the restriction of the use of certain hazardous substances in electrical and electronic equipment*

Account Manager

Mauro Uboldi

Nome / Name

October 2018

Date

Firma / Signature